PROMOTING HEALTHY AGEING
WITH COGNITIVE EXERCISE

THE PACE STUDY
A RANDOMISED CONTROLLED TRIAL OF COGNITIVE ACTIVITY
IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT

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At The University of Western Australia, candidates for the Degree of Doctor of Philosophy may present their thesis as a collection of papers that have been published or as a combination of work including publishable material. This thesis comprises an introductory chapter, four published papers and a discussion exploring the benefits of cognition-focused interventions (CFI) for older adults with mild cognitive impairment (MCI).

A literature review, including a published paper summarising trends in CFI, sets the scene for the additional published works that follow. A description of the study population and methodology, is accompanied by two further (published) chapters which review the outcomes of the research trial. Each of the papers in the body of the thesis are presented as they appear in print, except where noted, and include minor editorial changes to achieve consistency with prior and subsequent chapters. The thesis concludes with a discussion of the implications of the findings and future directions for research to address outstanding questions.

The papers presented in this thesis were developed by the candidate in consultation with the candidate's supervisors. The candidate received assistance with the analysis and interpretation of the data, though prepared the initial draft of each manuscript independently. The precise contribution of the candidate, the candidate's supervisors, and others, is documented in greater detail where appropriate.
STATEMENT OF CANDIDATE CONTRIBUTION

I declare that this submission is my own work and to the best of my knowledge it contains no subject matter or material previously published or collated by another author, except where due acknowledgement is made in the thesis. The intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project is acknowledged.

I conducted the literature review, designed the study and concepts (including the assessment battery and interventions) and recruited participants. I undertook aspects of the participant assessments (whereby my doing so did not compromise the interpretation of the outcome measures) and ran all aspects of the intervention process. In addition, I was responsible for all the follow up telephone calls and booster sessions. A research assistant was involved in the testing of participants to reduce any potential for response bias. My supervisors provided expert advice and intellectual critique.

Assistance was received, from my supervisor and the centre statistician (Dr. K. McCaul), with the analyses reported in this thesis.

The opportunity to perform this research arose from a start up grant from the Centre for Excellence in Alzheimer’s Disease Research and Care (L0602). In 2008 the NHMRC awarded a Dementia Grant (513772, to our collaborative research team), upon which I was the Chief Investigator.
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Book Chapter:

Dementia is one of the most frequent mental health disorders of older people and a leading cause of years of life lost due to disability in Australia. There is increasing evidence that the onset of dementia can be delayed by targeting potentially modifiable risk factors and focusing on at risk groups. Much emphasis has been placed on the benefits of mentally stimulating leisure activities and the role of cognitive interventions to maintain cognition and prevent, or at least delay, decline. One group of target individuals are older adults with a diagnosis of mild cognitive impairment (MCI), a clinical state considered potentially predictive of future cognitive decline.

The purpose of this research was to determine whether a structured cognitive activity (CA) strategy training program, specifically designed for individuals with MCI, could prevent cognitive decline. Baseline neuropsychological assessments were completed with 160 community dwelling older adults, aged 65 years and over, who were randomised to participate in either a program of CA strategy training or a control, education program. Upon completion of the five-week intervention, participants were re-assessed and were subsequently followed up at additional 12-month and 24-month time intervals.

Despite the intervention being perceived as favourable by all study participants and the intervention delivered in a consistent manner, inspection of performance upon the primary outcome measure, the CAMGOG-R, revealed no significant differences between the groups at post intervention follow-up assessments. There was also no convincing evidence of benefit across secondary outcome measures addressing more specific aspects of cognition.
(attention, memory, executive abilities), lifestyle (physical and leisure activities) and well being (mood and functional status).

The findings were not supportive of the application of this type of intervention for decreasing the rate of cognitive decline amongst older adults with MCI. The outcomes may have been influenced by a number of potential design factors, including the content and length of the interventions, the social nature of the group application and the chosen outcome measures. Replication and, ideally, larger scale multi-modal interventions with lengthy follow-up intervals allowing for detection of conversion to dementia, would assist in clarifying the potential value of cognition-focused interventions (CFI) for at risk, older adult populations. However, the cost-effectiveness trade-off also requires consideration.
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<tr>
<td>AD</td>
<td>Alzheimer’s disease</td>
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<tr>
<td>ADAS-cog</td>
<td>Alzheimer’s disease assessment scale – cognitive subscale</td>
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<tr>
<td>AUDIT</td>
<td>Alcohol Use Disorders Identification Test</td>
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<tr>
<td>ADL</td>
<td>Activities of Daily Living</td>
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<tr>
<td>ApoE ε4</td>
<td>Apolipoprotein E – Epsilon 4 Allele</td>
<td></td>
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<tr>
<td>APP</td>
<td>Amyloid Precursor Protein</td>
<td></td>
</tr>
<tr>
<td>Aβ</td>
<td>Beta-amyloid</td>
<td></td>
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<tr>
<td>BDNF</td>
<td>Brain Derived Neurotrophic Factor</td>
<td></td>
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<tr>
<td>CA</td>
<td>Cognitive Activity</td>
<td></td>
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<tr>
<td>CAMCOG-R</td>
<td>Cambridge Cognitive Examination - Revised</td>
<td></td>
</tr>
<tr>
<td>CDR</td>
<td>Clinical Dementia Rating</td>
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<tr>
<td>CERAD</td>
<td>Consortium to Establish a Registry for Alzheimer’s disease</td>
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<tr>
<td>CFI</td>
<td>Cognition-Focused Interventions</td>
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<tr>
<td>COWAT</td>
<td>Controlled Oral Word Association Test</td>
<td></td>
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<td>CR</td>
<td>Cognitive Rehabilitation</td>
<td></td>
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<tr>
<td>CS</td>
<td>Cognitive Stimulation</td>
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<tr>
<td>CSF</td>
<td>Cerebrospinal Fluid</td>
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<tr>
<td>CT</td>
<td>Cognitive Training</td>
<td></td>
</tr>
<tr>
<td>CVLT-II</td>
<td>California Verbal Learning Test – Second Edition</td>
<td></td>
</tr>
<tr>
<td>DLB</td>
<td>Dementia with Lewy Bodies</td>
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<tr>
<td>DSM-IV-TR</td>
<td>Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revision</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>DSM-5</td>
<td>Diagnostic and Statistical Manual of Mental Disorders Fifth Edition</td>
<td></td>
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<tr>
<td>DTI</td>
<td>Diffusion Tensor Imaging</td>
<td></td>
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<tr>
<td>FTD</td>
<td>Fronto-temporal Dementia</td>
<td></td>
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<tr>
<td>FTLD</td>
<td>Fronto-temporal Lobar Degeneration</td>
<td></td>
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<tr>
<td>F/UP</td>
<td>Follow-up</td>
<td></td>
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<tr>
<td>GAS</td>
<td>Goal Attainment Scaling</td>
<td></td>
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<tr>
<td>GDS</td>
<td>Global Deterioration Scale</td>
<td></td>
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<tr>
<td>GE</td>
<td>General Education</td>
<td></td>
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<tr>
<td>ICD-10</td>
<td>International Statistical Classification of Diseases and Related Health Problems 10th Revision</td>
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<tr>
<td>IL1</td>
<td>Interleukin-1</td>
<td></td>
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<tr>
<td>IQ</td>
<td>Intelligence Quotient</td>
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<tr>
<td>LAQ</td>
<td>Leisure Activity Questionnaire</td>
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<tr>
<td>MCI</td>
<td>Mild Cognitive Impairment</td>
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<tr>
<td>MFQ</td>
<td>Memory Functioning Questionnaire</td>
<td></td>
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<tr>
<td>MHQ</td>
<td>Medical Health Questionnaire</td>
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</tr>
<tr>
<td>MMSE</td>
<td>Mini Mental State Examination</td>
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</tr>
<tr>
<td>MVC</td>
<td>Motor Vehicle Collision</td>
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<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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</tr>
<tr>
<td>NESB</td>
<td>Non English Speaking Background</td>
<td></td>
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<tr>
<td>NFT</td>
<td>Neurofibrillary Tangles</td>
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<tr>
<td>NICE</td>
<td>National Institute for Health and Clinical Excellence</td>
<td></td>
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<tr>
<td>NIH</td>
<td>National Institutes of Health</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NINCD-ADRDA</td>
<td>National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer’s Disease and Related Disorders Association</td>
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<tr>
<td>PACE</td>
<td>Promoting Healthy Ageing with Cognitive Exercise</td>
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<tr>
<td>PAQ</td>
<td>Physical Activity Questionnaire</td>
<td></td>
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<tr>
<td>PET</td>
<td>Positron Emission Topography</td>
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<tr>
<td>PHQ-9</td>
<td>Patient Health Questionnaire – Nine Item</td>
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<tr>
<td>PIB</td>
<td>Pittsburgh Compound - B</td>
<td></td>
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<tr>
<td>QoL-AD</td>
<td>Quality of Life in Alzheimer’s Disease</td>
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<tr>
<td>RA</td>
<td>Research Assistant</td>
<td></td>
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<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
<td></td>
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<tr>
<td>RPH</td>
<td>Royal Perth Hospital</td>
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<tr>
<td>SAILS</td>
<td>Structured Assessment of Independent Living Skills</td>
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<tr>
<td>SD</td>
<td>Standard Deviations</td>
<td></td>
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<tr>
<td>SNSQ</td>
<td>Social Network Satisfaction Questionnaire</td>
<td></td>
</tr>
<tr>
<td>TICS-M</td>
<td>The Modified Telephone Interview for Cognitive Status</td>
<td></td>
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<tr>
<td>TMTA</td>
<td>Trail Making Test Part A</td>
<td></td>
</tr>
<tr>
<td>TMTB</td>
<td>Trail Making Test Part B</td>
<td></td>
</tr>
<tr>
<td>VD</td>
<td>Vascular Dementia</td>
<td></td>
</tr>
<tr>
<td>WACHA</td>
<td>Western Australia Centre for Health and Ageing</td>
<td></td>
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<tr>
<td>WAIS-III</td>
<td>Wechsler Adult Intelligence Scale – Third Edition</td>
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<tr>
<td>WMH</td>
<td>White Matter Hyperintensities</td>
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CHAPTER 1

OVERVIEW AND BACKGROUND
CHAPTER 1: OVERVIEW AND BACKGROUND

1.1 Introduction

There is considerable concern in Western society about our ageing population and the economic impact of health care for older adults, particularly the burden of dementia.

Dementia is a syndrome caused by brain pathology which compromises cognitive (mental), social and emotional functioning (1). In Australia, the most commonly recognized cause of dementia in older adults is Alzheimer’s disease (AD) (2). Dementia is also the leading single cause of disability and, within Australia, this condition is projected to affect almost one million people by 2050 (2). Worldwide by 2050, 115.4 million people will be living with dementia (3).

The personal, emotional, financial and social costs associated with dementia are significant (3) and make the study of this condition important. Understanding what constitutes healthy cognitive ageing, the identification of at risk populations, and the development of interventions for delaying cognitive decline has become an increasingly pressing focus of research. It has been hypothesised that engaging in mentally stimulating activity reduces the risk of developing dementia and it is this particular proposition that forms the subject matter of this thesis.

Chapter 1 aims to highlight what is known about cognitive functioning in older adulthood, risk factors for decline and current preventive approaches, with particular attention to the
role of mentally stimulating activity and cognition-focused interventions (CFI). The term “cognition” refers to mental processes that encompass a variety of abilities including though not limited to, attention, memory, language and problem solving. The complexities related to characterising age-associated cognitive change will be established, including the potential contributions from environmental and biological factors, together with the methodological challenges that accompany attempts to quantify its precise nature. Discussion will then shift focus towards abnormal cognitive decline in older age, with an overview of dementia, followed by exploration of the concept of mild cognitive impairment (MCI) and the relevance of at risk populations. Current recommended protective and preventive practices will be reviewed, together with a summary of the published literature regarding the role of mental stimulation for the prevention of cognitive decline in older adults. The publication, “Cognition-Focused Interventions for Older Adults” will also be presented. This chapter will conclude with a summary of the knowledge gaps, placing the present research question in context, and clarifying the specific aims and hypothesis of the Promoting Healthy Ageing with Cognitive Exercise (PACE) study.
1.2 Cognition in Older Adulthood

1.2.1 Normal Ageing and Cognitive Change Across the Life Span

Advancing age is recognised as the most important risk factor for dementia (4). Whilst progressive memory decline is considered a hallmark clinical expression of the pathological process of AD (5), changes in cognition may not necessarily indicate the presence of disease (6). Individual complaints, particularly regarding memory, become more prevalent during middle age (7), highlighting the importance of differentiating between expected levels of functioning and abnormal cognitive decline. Quantifying the boundary limits of age-associated cognitive impairment has been difficult and confounded not only by differences between individuals, but also variability in the rates of change observed across differing cognitive processes (e.g. attention versus memory versus language skills) (8). This issue is further complicated by the myriad of terminology used to characterise cognitive variables (9). Table 1.1 provides an overview of descriptors of cognition referred to in this thesis. Review of the literature does, however, reveal some general consensus regarding the cognitive profiles of healthy older persons, a summary of which is presented below.
Table 1.1: Cognitive domains and associated definitions.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Attention</td>
<td>Capacity to direct, maintain and focus thoughts in order to manage and manipulate information in the environment.</td>
</tr>
<tr>
<td>Information Processing Speed</td>
<td>Speed of thinking and reaction time.</td>
</tr>
<tr>
<td>Memory</td>
<td>Processes involved in the learning, retention and recall of information.</td>
</tr>
<tr>
<td>Language</td>
<td>Expressive communication of thoughts/ beliefs (oral or written) and ability to comprehend such material.</td>
</tr>
<tr>
<td>Perceptual and Visuo-spatial</td>
<td>The interpretation of visual information to recognise, make sense and manipulate environmental stimuli and to judge the orientation and spatial relationships of material.</td>
</tr>
<tr>
<td>Executive Functions</td>
<td>Higher-level abilities such as the capacity to, solve novel problems, plan and organise, form concepts, and weigh up decisions and outcomes to select appropriate courses of action and behaviour.</td>
</tr>
</tbody>
</table>

1.2.1.1  **Attention and Information Processing Speed**

Contrasting patterns of cognitive change occur across the lifespan, with certain capacities seemingly more susceptible to age-related decline than others. Attention and information processing speed abilities appear particularly vulnerable to the effects of ageing. Gradual, age-related decline begins in young adulthood (the mid 20s) and becomes more pronounced towards the early retirement years (60s) (9, 10). Older adults experience particular difficulty performing complex attentional tasks such as trying to process two or more sources of information at one time or switching from one task, back to another (11). This is associated with a decline in processing resources and these observations have been made in cross sectional and longitudinal studies (e.g. (10, 12)). Decreased processing speed and reduced efficiency of working memory may potentially undermine age-related
performances by compromising the individual’s capacity to mentally manipulate information efficiently, reducing the potential uptake of details, and slowing reaction times.

1.2.1.2 Memory

The human memory system has been defined and operationally decomposed in many different ways, and the diversity and complexity of the theories advanced in the literature precludes in depth discussion here ((13) reviews this subject). Complaints regarding memory are common in later life, though the reported frequency of such has been noted to vary from estimates of 27% to 88% with greater subjective concern rated by those aged in their 70s and beyond (14, 15). The “tip of the tongue” phenomenon, needing to re-read information due to forgetting and having trouble recalling something that was discussed recently, are common of the types of complaints reported by older adults (16). It is well recognised that as individuals age, they become less adept at learning and recalling new material (17). Whilst these progressive changes in memory functioning occur in healthy adults as part of the normal ageing process, decay in episodic memory (memory for personal events) is also considered a strong indicator of early, pre-dementia stages of AD (18).

1.2.1.3 Executive Functions and Visuo-Spatial Skills

Decline in what has been conceptualised as “fluid” intelligence (19), such as novel problem solving and reasoning (considered executive functions) and visuo-spatial abilities, becomes noticeable as adults progress towards their 60s (20). Performance on these tasks is measured with tests involving the interpretation of abstract patterns and matrices, and
construction of visual designs. Other aspects of executive functioning such as goal
directed planning, strategic formulation, and decision making have also been implicated in
the collection of higher-level cognitive abilities that decline with advancing age (21).

1.2.1.4 Preserved or Enhanced Cognition with Ageing

Contrasting the deterioration observed in attentional capacity, processing speed, episodic
memory and executive functioning, are performances on tests of vocabulary and acquired
general knowledge (part of our language and semantic memory). Often characterised as
“crystallised” abilities (19), such knowledge is enhanced throughout the lifespan up until
the sixth or seventh decade and is associated with educational, occupational and intellectual
pursuits. Decline becomes apparent only in very late old age (8), with these abilities
demonstrating greater resilience to the effects of ageing and neurodegeneration. Other
aspects of memory, including autobiographical memory (one’s personal past), procedural
memory (knowledge of skills and actions) and implicit memory (behavioural change
associated with prior exposure/experience) are largely preserved across the lifespan (11).

Despite agreement regarding the evolution of cognitive abilities with advancing age, a
number of different biological processes have been proposed as potential contributing
factors to decline, with each having variable impact on capacity. Additionally, there
continues to be a lack of consensus as to the age with which the processes of decline begin,
with complexities associated with individual variation and the potential influences from
various lifestyle factors. Exploration of these issues now follows.
1.2.2 Biological Processes Involved in Cognitive Change

Relative to current knowledge regarding disease states, our understanding of normal brain ageing remains limited. Whilst it is well recognised that cognitive change is not unitary, with ageing having distinctive effects across different abilities, uncertainty remains as to how cognitive processes are organised within the human brain (22) and the biological manifestations of change (9). This ambiguity appears due to the nature of the research, together with measurement and methodological limitations for investigating the correlation between “brain changes” and “cognitive changes” (23). Brain changes can be conceptualised into morphological (e.g. structural), inflammatory, oxidative and metabolic, and neuromodulatory.

1.2.2.1 Morphological changes

Several morphological changes have been documented in normal ageing in the absence of demonstrable pathology, with post-mortem and in-vivo imaging studies focusing on brain weight and volume, intracranial space, and ventricular and sulci changes. The advent of increasingly sophisticated tools for assessing the structural integrity of the brain has encouraged the use of cranial imaging techniques to measure volumetric properties. The caudate, cerebellum, hippocampus and pre-frontal areas of the brain appear particularly susceptible to volume loss (atrophy) (24), with these structures implicated in goal directed behaviour, planning and reasoning, and memory (25-27). However, there is uncertainty about the timeframe across which atrophy occurs, with a lack of consensus as to whether there is a steady low level of atrophic change throughout adult life, or if more accelerated processes occur as the individual moves into older adulthood (28).
Change in white matter integrity has also been proposed as underpinning alterations in cognition (24, 29). The cortical and subcortical areas of the brain are linked by cerebral white matter which plays an integral role in the facilitation and distribution of neural circuits important in sensorimotor function, intellect and emotion (30). White matter hyperintensities (WMH – lesions identified on cranial magnetic resonance imaging, MRI, scans) are commonly associated with changes in the vascular supply of brain tissue, and can also be caused by a variety of insults including inflammatory disease, demyelination or trauma (24). Whilst the presence of WMH is a common finding in healthy older adult groups, these changes are often seen in individuals with cardiovascular risk factors (e.g. hypertension; hypercholesterolemia) (31). The identification of WMH has been connected with age-associated cognitive decline (measured by psychological testing), with deficits noted in the domains of processing speed, memory and executive functioning (24, 30, 32). Higher burden of WMH has also been associated with a transition from normal cognition to MCI and dementia, however there are no universally acceptable critical thresholds of lesion severity which clearly establish “cut-offs” between normal and abnormal cognitive performance (31, 32).

1.2.2.2 Inflammatory, Oxidative and Metabolic Changes

Another proposed mechanism undermining cognition with advancing age is the reduced compensatory capacity of the brain to cope with disruption to homeostatic mechanisms associated with inflammation, oxidative stress, and metabolic and hormonal shifts. The ageing brain may be more vulnerable to the effects of inflammation associated with infection and injury. During infection, the hippocampus, a region of the brain noted to be
particularly important for memory consolidation, experiences pronounced elevations of interleukin-1 (IL1) - a pro-inflammatory cytokine (a substance secreted by cells of the immune system) (33). Increased hippocampal IL1 negatively impacts on memory functioning by compromising synaptic plasticity and decreasing long-term potentiation (processes important in learning and the formation of memories) (34). It has been proposed that ageing may prime or sensitise microglia in the hippocampi to produce higher levels of IL1 (33). Oxidative stress situations (caused by a build up of highly reactive molecules in cells) can result in structural changes to the brain, affecting cells and the communication between them (35). Relationships have also been observed between age-associated memory decline and reductions in brain and plasma antioxidants (36).

Metabolic processes may play influential roles in brain ageing and cognition. In the brain, insulin receptors are located in the hippocampus, entorhinal cortex and frontal cortex – areas of the brain involved in episodic memory and executive functioning (33). Insulin also has a reciprocal relationship with the Beta-amyloid peptide (implicated in processes associated with AD) and modulates central nervous system levels of neurotransmitters such as acetylcholine and norepinephrine (influential in attentional and memory processes) (33). Abnormalities in the way the brain regulates and utilises insulin have also been proposed as contributing mechanisms to age-associated cognitive decline (33).

The “metabolic syndrome” is a constellation of cardiovascular risk factors (abdominal obesity, hypertriglyceridemia, low high-density lipoprotein levels, hypertension and hyperglycemia). Diagnosis of the syndrome is based on the presence of three of the five criteria and is associated with increased risk of cardiovascular disease and mortality (37).
This syndrome has also been identified as a risk factor for accelerated cognitive decline (33) (38).

1.2.2.3 **Neuromodulatory Changes**

Neuronal alterations associated with cognitive deficits have been observed across a number of systems, including but not limited to the cholinergic, dopaminergic, serotonergic and noradrenergic system (39). These findings implicate possible additional neuromodulatory processes undermining cognition in the ageing brain.

Acetylcholine is a neurotransmitter that appears to play a key role in learning and memory processes. Brain cholinergic innervation comes from five major nuclei (basal forebrain, diencephalus, striatum, brain stem and spinal cord). Basal forebrain volumes have been strongly linked to changes in cognition associated with normal ageing, with degeneration of the cholinergic neurons of this complex purportedly being associated with progressive memory deficits (40). Positive correlations have also been found between general intelligence and basal forebrain cholinergic system volumes (41).

Another potential contributing factor to age-associated cognitive change is the loss of dopaminergic receptors, which are thought to play a role in the modulation of attention and response to stimuli in the environment (24). In a recent review, Bäckman and colleagues (42) concluded that dopamine functions are particularly powerful mediators of age-related cognitive change in aspects of executive functioning, memory and processing speed.
 Debate remains regarding the trajectory of age-related dopamine losses and the degree of acceleration of these processes across different points in the life span (42).

The specific role of the serotonergic system in behavioural and cognitive processes is less clear. What appears to be of greater significance is the interaction of serotonin with other neurotransmitters, with the combined degeneration of systems (e.g. cholinergic, dopaminergic, serotonergic) having an influence on adaptive learning, behavioural inhibition and decision making (43, 44).

Finally, noradrenergic pathways have been implicated in attention, learning and memory processes (45) and may also be vulnerable to age-associated neurotransmitter declines. Important sites identified as being involved in the modulatory effects of noradrenergic receptors on cognition include the locus coeruleus, amygdala and hippocampus (44).

As summarised in Table 1.2, recognisable changes in neuroanatomical and neurochemical processes in older adults can influence cognition. However, variability within and across individuals, particularly with respect to burden thresholds of anatomical change and associated cognitive decline is not an uncommon observation. Influences from lifestyle factors (e.g. diet, smoking, and activity level) have also been identified as contributing to varying presentations (46). Additionally, methodological factors inherent to research and clinical data collection may have further implications for our understanding of what constitutes “normal ageing”.
Table 1.2: Summary of age-associated neuroanatomical and neurochemical processes influencing cognitive functioning.

<table>
<thead>
<tr>
<th>Biological Process</th>
<th>Location of Neural Change</th>
<th>Cognitive Ability Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volumetric Change</td>
<td>Caudate, cerebellum, hippocampus and pre-frontal cortex</td>
<td>Goal directed behaviour, planning and reasoning, memory</td>
</tr>
<tr>
<td>White Matter Hyperintensities</td>
<td>Vasculature of cortical and subcortical areas</td>
<td>Processing speed, memory, and executive functioning</td>
</tr>
<tr>
<td><strong>Homeostatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infection/ Oxidative Stress</td>
<td>Hippocampus and generalised cellular changes</td>
<td>Memory</td>
</tr>
<tr>
<td>Insulin</td>
<td>Hippocampus, entorhinal cortex and frontal cortex</td>
<td>Episodic memory and executive functioning</td>
</tr>
<tr>
<td>Metabolic syndrome</td>
<td>Cerebrovascular supply</td>
<td>Generalised cognitive decline</td>
</tr>
<tr>
<td><strong>Neuromodulatory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholinergic</td>
<td>Basal forebrain</td>
<td>Learning, memory and general intelligence</td>
</tr>
<tr>
<td>Dopaminergic</td>
<td>Fronto-striatal system</td>
<td>Attention and response to stimuli in the environment</td>
</tr>
<tr>
<td>Serotonergic</td>
<td>Cerebral cortex, hippocampus and amygdala</td>
<td>Adaptive learning, behavioural inhibition and decision making</td>
</tr>
<tr>
<td>Noradrenergic</td>
<td>Locus coeruleus, amygdala and hippocampus</td>
<td>Attention, learning and memory</td>
</tr>
</tbody>
</table>
1.2.3  Methodological Challenges in the Assessment of Age-Associated Cognitive Change

Research findings regarding age-associated cognitive performance are susceptible to methodological issues (29). Three methodology variables of particular significance are study design, recruitment techniques and choice of outcome measures. Each can result in differing conclusions regarding age-related trends in cognitive decline.

1.2.3.1  Study Design

Two examples of differing study design used in this research area are cross sectional and longitudinal. Cross sectional designs typically recruit individuals of different ages, tested during the same time frame, and compare their results on psychological measures. This differs to longitudinal designs in which a group of participants is followed up over a sequential time frame. Whilst cross sectional designs present as a very practical way of studying the cognitive performances of particular age groups, confounds associated with cohort differences can have implications for the interpretation of outcomes (29, 47). Variability between groups associated with educational, cultural and socio-economic factors can confound age related observations (29). Longitudinal studies offer valuable information on rates of decline, risk factors, and the relationships between cognitive and functional capacity, however practice effects (associated with repeated assessment) and selective attrition may create bias and uncertainty regarding the magnitude of change (8, 9).
1.2.3.2 Selection Criteria and Assessment

Selection criteria and, in particular, the exclusion of those with medical conditions common to older adults and known to influence cognition, may further skew perceptions of what may be “normal” age-associated decline (17). For example, sensory disturbance, cardiovascular conditions and sensitivity to medication effects are health issues that commonly affect older adults and their cognitive performance (48, 49), often resulting in reduced cognitive performance and therefore misperception of impairment. Interpretation of age-related decline, therefore, needs to be considered in light of what may, for example, be the cognitive manifestations of various disease states, or artefact associated with potential visual and hearing deficits. Variability across and within individuals attributable to factors such as genetics, lifestyle, personality and personal interests and pre-morbid intelligence will also affect the observed degree of associated decline (50), raising doubts about the generalisability and validity of findings.

In addition to the methodological issues associated with study design and participant selection, the extensive variety of psychological tests and limited normative data for older adults can alter inferences regarding “normal” and “abnormal” performances (51, 52). This issue is further compounded by interpretation of the specific construct assumed to be measured by the chosen instrument. Few tests are “pure” indicators or domain specific, with multiple cognitive processes often involved in task completion (53, 54). The format of the assessment of cognition is also likely to be different in research versus clinical settings. The nature of the test battery chosen will be driven by different principles of reliability and validity depending on diagnostic or investigative goals. Extrapolating interpretations regarding performance in one setting to another may further contribute to
differences in decision making processes regarding cut-off points for abnormality (55).

This is particularly pertinent in situations whereby simple screening measures may not be sensitive enough to detect decline in individuals with higher intellect or in situations whereby the cultural background of the person is not taken into account in the evaluation process of the results (51, 56).
1.3 Abnormal Cognitive Ageing – Dementia and Cognitive Impairment

1.3.1 Dementia

Derived from the Latin “demens” meaning “without mind” the term “dementia” has evolved during the 19th and 20th centuries in association with advances in scientific knowledge (57). Considered an acquired, chronic and often irreversible deterioration of cognition, dementia compromises the individual’s capacity to successfully and independently undertake everyday activities (1). The five most commonly recognised conditions are AD, vascular dementia (VD), dementia with Lewy bodies (DLB), frontotemporal lobar degeneration (FTLD), and mixed dementia (AD and VD), although prevalence rates do vary in accordance with demographics (e.g. gender, age, ethnicity) (58-60). Each presents with differential patterns of neuropsychological impairment and a characteristic clinical course. The rate of decline and the functional deficits associated with each of these conditions is influenced by the specific nature of the accumulated neuropathology (see Table 1.3).

1.3.1.2 Alzheimer’s Disease

First identified more than 100 years ago, AD is the most frequent type of progressive dementia, accounting for approximately 60% of clinically diagnosed cases (61). The major early clinical hallmark of AD is memory impairment and clinical diagnosis of the condition is generally made in accordance with criteria from the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) (62), National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association (NINCD – ADRDA) (63, 64) or
using the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) (65).

It remains unclear as to what causes AD, however two hallmark neurohistological features of the disease process are senile plaques and neurofibrillary tangles (5). Although not specific to AD, the distribution and pathological load of these plaques and tangles is associated with the typical clinical course of cognitive and functional decline (5). In addition to changes in memory, patients will experience other difficulties such as problems with orientation (e.g. day of the week; time of day), compromised language, navigational disorientation and inability to make complex decisions and judgements. Alongside the cognitive changes comes disruptions in capacity to manage usual day-to-day responsibilities, as well as alterations in behaviour and personality. As individuals progress through increasing stages of severity they become gradually more dependent on assistance from others and usually die of complications associated with their decreased ability to function such as infections (61). There is no cure for AD and treatments focus on maintaining function, minimising behavioural disturbance and attempting to slow or delay symptom onset and progression.
Table 1.3: Major deficits, core neuropathology and progression of common dementia processes (66-69).

<table>
<thead>
<tr>
<th>Dementia</th>
<th>Prominent Cognitive Changes</th>
<th>Neuropathology</th>
<th>Progression/Prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>Marked impairment in episodic memory, impaired naming and executive deficits.</td>
<td>Amyloid plaques and neurofibrillary tangles with early changes in the medial temporal lobe structures.</td>
<td>Continued progression towards global impairment requiring total care. Observed survival rate is variable – four to eight years on average post diagnosis.</td>
</tr>
<tr>
<td>VD</td>
<td>Decline in attention, processing speed, executive abilities. May be focal deficits if major CVA (e.g. dysphasia). Psychiatric complications are common.</td>
<td>Cerebrovascular disease (small, large or mixed vessel pathology).</td>
<td>Dependent on pathology; Typically relatively abrupt onset, stepwise deterioration and fluctuating course of cognitive functioning. Onset more insidious and slowly progressive with small vessel ischaemic changes.</td>
</tr>
<tr>
<td>DLB</td>
<td>Visuospatial deficits prominent, together with impaired attention and executive functioning.</td>
<td>Diffuse and numerous Lewy bodies (abnormal aggregations of alpha-synuclein) in the neocortex, diencephalon, brain stem and basal ganglia.</td>
<td>Gradual progression, though rates variable across individuals with mean survival duration of five to eight years post diagnosis.</td>
</tr>
<tr>
<td>FTLD</td>
<td>FTD=progressive behavioural changes in personality and mood; executive deficits.</td>
<td>Atrophy of the prefrontal and anterior temporal cortex; differences in atrophic distribution give rise to the clinical variants of FTD.</td>
<td>Progression towards mutism and vegetative states and subsequent death over eight to ten years.</td>
</tr>
<tr>
<td></td>
<td>PPA=progressive expressive aphasia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD=deterioration in semantic knowledge.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AD=Alzheimer’s disease; VD=vascular disease; DLB=dementia with Lewy bodies; FTLD=frontotemporal lobar degeneration; FTD=frontotemporal dementia; PPA=primary progressive aphasia; SD=semantic dementia; CVA=cerebrovascular accident
1.3.2 Mild Cognitive Impairment

1.3.2.1 Definitions and Diagnosis

In 2004 the editors of *Dialogues in Clinical Neuroscience* devoted a whole issue to the discussion of MCI, considering it an opportune time to critically review the available evidence regarding this concept (70). In 2006 an entire book on the subject was published (71) and over the last ten years more than 2000 sources of information have been issued on the subject matter (searching for MCI using MEDLINE databases). Generally speaking, the term MCI has been used interchangeably to describe a heterogeneous group of older adults considered to be in a transitional phase with respect to their level of cognitive functioning. Not necessarily fulfilling diagnostic criteria for dementia, their cognitive abilities are below what might be considered “normal” for their age.

Whilst it may be argued that the concept of MCI originated from the mid 1950s work of Consultant Psychiatrist V. A. Kral (72), the term was reportedly first used in the late 1980s in association with the rating requisites of the Global Deterioration Scale (GDS) (73). Devised for the study of AD, the GDS incorporated seven clinical stages, the third of which recognised the presence of mild cognitive difficulties that impacted on the individual’s capacity to perform complex activities of daily functioning (73).

In their 1991 paper titled “mild cognitive impairment in the elderly: predictors of dementia” Flicker and colleagues characterised the condition further, identifying that 72% of their elderly population who met the GDS Stage 3 criteria, and had objective impaired psychological test performances, developed dementia over a two-year period (74).
Another popular rating scale used to classify dementia severity is the Clinical Dementia Rating (CDR) scale (75). A five-point ordinal scale is utilised, whereby a score of 0 indicates no dementia, 0.5 is questionable dementia and scores of 1, 2 and 3 representing mild, moderate and severe dementia respectively (75). It is the score of 0.5 that has been considered reflective of an intermediate stage of decline or representative of MCI, although as with the GDS, concern has been raised regarding the use of rating scales, rather than specific clinical criteria for the diagnosis of MCI.

Petersen et al. (1999) (76) debated the use of severity scales to capture this population, highlighting the risks of selecting samples actually comprising both individuals with MCI and those with very mild dementia. They devised a set of research criteria to differentiate healthy controls, those with MCI, and individuals with mild AD (77). Specifically, a diagnosis of MCI was considered appropriate if there was a memory complaint and memory function was assessed to be 1.5 standard deviations (SD) below age and education norms. Activities of daily living (ADL) needed to be preserved, with normal global cognitive function and no indication that the individual was clinically demented. The addition of having an informant corroborate the subjective memory complaint was subsequently added to the criteria in 1999 (76).

Revision and expansion of the criteria following an international conference in 2003 recognised that deficits in cognitive domains aside from memory (e.g. language, praxis) were important predictors for progression to neurodegenerative conditions other than AD (78). Individuals with predominately memory impairment (either in isolation or with other cognitive deficits – “amnestic MCI”) were considered at risk for AD, whereas dysfunction
in single or multiple domains other than memory, could be indicative of alternate neurological processes (e.g. FTD, DLB) (79). Recommendations for new and more generalised MCI criteria recognised that the individual was neither normal nor suffering dementia, and that whilst ADL were preserved, there could be mild impairment in more complex instrumental functions (e.g. managing finances) (78).

Further review of the criteria was undertaken by the “MCI Working Group of the European Consortium on Alzheimer’s Disease” (80). In a 2006 publication, Portet et al. claimed that their proposed criteria were useful for the recognition of at risk individuals and also had the benefits of incorporating (in the diagnostic process) a structured framework within which therapeutic strategies and management could be identified (80). The proposed criteria also recognised deficits in cognition other than memory, and the need for observations of decline from 12 months previously.

Whilst more recent recommendations were made by a working group party for the National Institute on Aging-Alzheimer’s Association (2011), these were specific for the diagnosis of MCI due to AD (81). The core clinical criteria remain essentially unchanged, with the exception of a focus on episodic memory as a cognitive characteristic, together with the need to rule out other potential clinical causes of decline (e.g. vascular contributions; traumatic insult; medical issues). Notably, this working group also included a diagnostic framework to incorporate research exploring a role for biomarkers in the etiology and clinical progression in MCI (81). Biomarkers used to predict progression of MCI to dementia have included the evaluation of the beta-amyloid protein (Aβ, using positron emission tomography, PET; measures in cerebrospinal fluid, CSF), neuronal injury (e.g.
measuring atrophic changes in the brain using functional and structural imaging techniques) and biochemical changes (e.g. inflammation; oxidative stress). However, limitations in the research regarding a role for biomarkers in the diagnosis of MCI and prediction of conversion to dementia have been identified, questioning their utility in an evaluative process, particularly in clinical populations (82, 83). Finally, in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), there is no reference to MCI or dementia. Diagnostic terminology referring to these conditions are “minor neurocognitive disorder” and “major neurocognitive disorder”, with differences in diagnosis associated with deficit of cognitive decline (reference to standard deviations below the norm) and degree of interference with independence (65). Given the relative recent nature of this diagnostic update, it remains to be seen whether the use of this terminology and the lack of reference to MCI will be clinically adopted. Comparison of the evolution of the different diagnostic criteria is provided in Table 1.4.
Table 1.4: Summary of MCI criteria cited in the text (65, 76, 78, 80, 81).

<table>
<thead>
<tr>
<th>MCI Criteria</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Criteria for MCI</strong></td>
<td>1999</td>
</tr>
<tr>
<td>Subjective memory complaint (informant corroboration preferable)</td>
<td></td>
</tr>
<tr>
<td>Abnormal memory performance (1.5 SD below population mean)</td>
<td></td>
</tr>
<tr>
<td>Preservation of general cognition</td>
<td></td>
</tr>
<tr>
<td>ADL preserved</td>
<td></td>
</tr>
<tr>
<td>Absence of dementia</td>
<td></td>
</tr>
<tr>
<td><strong>International Working Group of MCI</strong></td>
<td>2003</td>
</tr>
<tr>
<td>The individual is neither normal nor suffering from dementia</td>
<td></td>
</tr>
<tr>
<td>Cognitive deterioration is evidenced by objective and/or subjective (patient or informant) indicators</td>
<td></td>
</tr>
<tr>
<td>ADL preserved with intact of minimally impaired complex instrumental functions</td>
<td></td>
</tr>
<tr>
<td><strong>MCI Working Group of the European Consortium on AD</strong></td>
<td>2005</td>
</tr>
<tr>
<td>Subjective cognitive complaints (via the patient or family)</td>
<td></td>
</tr>
<tr>
<td>Decline reported by the patient or informant that reflects change in ability over the previous 12 months</td>
<td></td>
</tr>
<tr>
<td>Cognitive disorders (any domain) evident on clinical evaluation</td>
<td></td>
</tr>
<tr>
<td>Absence of major repercussions on daily life (though there may be report of difficulty with complex daily activities)</td>
<td></td>
</tr>
<tr>
<td>Absence of dementia</td>
<td></td>
</tr>
<tr>
<td><strong>National Institute on Aging-Alzheimer's Association</strong></td>
<td>2011</td>
</tr>
<tr>
<td>Concern regarding a change in cognition</td>
<td></td>
</tr>
<tr>
<td>Impairment in one or more cognitive domains</td>
<td></td>
</tr>
<tr>
<td>Preservation of independence in functional abilities</td>
<td></td>
</tr>
<tr>
<td>Not demented</td>
<td></td>
</tr>
<tr>
<td><strong>DSM-5 “Mild Neurocognitive Disorder”</strong></td>
<td>2013</td>
</tr>
<tr>
<td>Evidence of modest decline in one or more cognitive domains (1 to 2 SD below the mean on testing; concern raised by patient or other)</td>
<td></td>
</tr>
<tr>
<td>Capacity for independence in daily activities is maintained</td>
<td></td>
</tr>
<tr>
<td>Cognitive deficits do not occur exclusively in the context of a delirium</td>
<td></td>
</tr>
<tr>
<td>Cognitive deficits not better explained by another mental disorder</td>
<td></td>
</tr>
</tbody>
</table>
1.3.2.2 Prevalence, Course and Clinical Implications

Review of prevalence and progression rates of MCI in population based studies reveals significant variability in the scope and range of presentations. Despite a diagnosis of MCI clinical course may vary, with stability in deficits, progression to dementia, or reversion to “normal” states of functioning potential outcomes. The uncertainty of these factors has implications with respect to clinical management, treatment interventions and prognosis. Collectively, studies have identified that the presentation, diagnosis and clinical course of MCI is highly susceptible to a variety of factors, including though not limited to:

- Varied application of criteria and use of objective tests
- Potential etiological heterogeneity
- Participant characteristics (including sampling)
- Length of follow-up
- Ascertainment bias.

Ganguli et al. (2011) (84, 85) found that in their population of 1,982 older adults aged 65 to 99 years, baseline prevalence of MCI varied as a product of the definition and classification system employed (2.3% to 35.2%). The annual rate of progression to dementia was also noted by the researchers to be much lower than that reported in other studies (0-3% versus 12-15%). Improvement in 6% to 53% of participants and stability over 12 months in another 29-92% of the group were also reported (84). In a sample of older women (≥85 years), the prevalence of MCI (using Petersen criteria (86)) was 23.2%, with slightly higher rates in the subgroup aged 90 years or older (87).
In their three-year longitudinal study of 379 older adults aged 75-95 years, Palmer et al. (2008) (88) classified participants according to standard (specific cognitive domains impaired; general cognition normal) and modified (specific cognitive domains impaired; general cognition either normal or slightly impaired) definitions of MCI. The point prevalence of MCI was 11.1% using the standard criteria and increased to 16.8 % for the modified criteria of MCI (88). Of the 350 individuals examined 36 months later, 20.3% had dementia.

The choice of psychometric parameters, including test instrument and statistical threshold for impairment also has implications with respect to classification and diagnosis. MCI classifications were observed to range from 4% to 70% in a community based sample of older adults aged 70-90 years, depending on the stringency of impairment applied (i.e. -1.0, -1.5 or -2.0 SD from the mean) and the number of compromised test domains (89). Individuals from a non English speaking background (NESB) were classified as cognitively impaired at even higher rates (89). This issue has also been addressed by Brooks et al. (2008) who commented on the psychometric risks of misclassifying MCI in healthy adults. They observed that healthy older adults could obtain low scores particularly when multiple cognitive measures are administered. In their sample a quarter of the healthy older adults assessed had one or more scores below the usually adopted 1.5 SD cut-off – emphasising the importance of recognising base rates of abnormal performances in healthy populations. These types of observations question the use of MCI criteria that requires impaired cognitive performance on only a single test measure. Indeed, the percentage of individuals with normal cognitive profiles at follow-up is not negligible and such may be reflective of misdiagnosis or “accidental” MCI during initial classification (90).
For those who consider MCI to represent a prodromal phase of AD, the perception is one of continual and gradual decline until the ultimate diagnosis of dementia (e.g. (91)). Others have indicated that relative to healthy older adults, those with a diagnosis of MCI decline at a faster rate (92) and yet research has shown that in some cases there may be minimal change in MCI status over time (93, 94). In an attempt to investigate and characterise the prognostic value and course of MCI to assist in primary care, Kaduszkiewicz and colleagues (2014) recruited 357 patients with MCI aged 75 years or older and followed them up over a three year period (95). Using the Winblad et al. criteria (78) they observed that 41.5% of their patients had a remittent course, 21.3% fluctuated (between MCI and normal), nearly 15% remained stable in their diagnosis and 22.4% progressed to dementia (95). Consistent with other published findings, individuals with multidomain presentations, were at greater risk for conversion in the future.

Whilst seemingly having its beginnings as a recognised pre-cursor of dementia, the term has also been applied to describe a reduction in cognition and function secondary to causes not necessarily neurodegenerative (e.g. psychiatric; medical conditions such as diabetes). This has raised some debate as to the scope within which the term should be applied and its clinical usefulness and relevance (96, 97). It has been suggested that a more appropriate way of utilising the terminology would be to consider MCI as representing a stage of severity of different disorders (97). Using this vernacular, a patient would be diagnosed as having, for example, “MCI of the vascular type”. Adding clarification regarding aetiology (when possible), allows a clearer picture of prognostic and management factors (97). Further, recognition of distinct aetiologies and their “MCI presentation” may assist in explaining observations that, whilst at increased risk, not all individuals with a diagnosis of
MCI will progress to dementia. As described, substantial numbers of individuals remain stable or even return to normal levels of functioning with time (94).

The variability in opinion regarding the interpretation of what it means to have a diagnosis of MCI may also reflect the influence of study population characteristics and the time frames which individuals are kept under review. Increased thresholds (i.e. greater degrees of cognitive impairment) lead to lower prevalence, though a higher proportion of conversion. Rate of reversion from MCI to no cognitive impairment rises as criteria are broadened (98). The use of clinical samples versus community living volunteers can result in observations of higher conversion rates (99, 100) and the way a study is presented or advertised can influence who self-selects to participate (e.g. a study on cognitive ageing versus a trial on memory loss in older adulthood) (98).

Higher age, lower education, hypertension and being male have been found to be factors which influence incidence of MCI in the elderly (101-103). Lower incidence rates of MCI are seen in younger healthy participants and the distribution of the age groups selected in the study, together with the proportion in each age category, can also influence conclusions regarding incidence and prevalence (104). Additionally, although older age increases the risk for diagnosis, once higher thresholds of age are included, the prevalence of MCI tends to taper off, as those formerly diagnosed with MCI subsequently meet criteria for dementia (98). Therefore, age at study entry and the length of follow-up have significant implications for claims regarding population prevalence and the rates associated with stability, reversion and progression to dementia with time.
Ascertainment bias has been raised as an issue of particular concern with respect to the diagnosis of MCI in higher functioning older adults. It has been well recognised that the incidence of dementia varies across high and low functioning persons (as determined by educational and occupational attainment and pre-morbid intelligence) (87, 105-107). The concept of “reserve” has been proposed as an explanation for this observation. Reserve refers to the maintenance of cognition despite pathologic disease burden that might otherwise cause cognitive decline or dementia, and can be a product of the physical makeup of the brain (i.e. size; number of cells) or cognitive attributes (i.e. the utilisation of neural networks and pathways) (108). However, it is also possible that methods for detecting cognitive change in high functioning persons, such as the specific neuropsychological measure/s employed, may lack sensitivity to identify decline. Proposed cut-offs of 1.5 SD below the mean, such as that explicitly stated in some MCI criteria, may not be sensitive to declines occurring for persons who are well educated or who have a high estimated pre-morbid intelligence quotient (IQ) (108).

1.3.2.3 Neuroimaging and Neurobiological Characteristics of MCI

Given the challenges and debate surrounding the clinical characteristics of MCI, it is not surprising that uncertainty regarding the pathological profile of the condition remains. Whilst identification of the biological events that may signal disease progression has significant implications for targeted disease prevention, synthesis of MCI population studies confirms the complexities associated with trying to understand this condition (109). As with most work in this area, methodological differences play a key role in trying to integrate study findings, though some consistencies are emerging.
In their recent review Mufson et al. (2012) (110) described research evaluating the evidence for structural, homeostatic, neuromodulatory and neuropathological processes in ante-mortem and post-mortem investigations of individuals with clinically diagnosed MCI. Notably, there appears to be clear overlap between normal age associated brain changes and MCI pathological processes, though no clearly demarcating biological marker that allows for discrete detection of threshold crossings during each transitory phase (e.g. normal to MCI to dementia).

Use of the Pittsburgh Compound-B (PIB) radioactive substance in PET to measure the presence of Aβ deposits as a potential biomarker in MCI to predict progression to AD, as well as, assisting in differential diagnosis, has been systematically reviewed in a recent (2014) paper by Zhang and colleagues (111). The authors concluded that there were limitations in the volume and quality of evidence on the diagnostic accuracy of PIB-PET and the methodological and interpretive heterogeneity across studies also meant that its role in clinical practice remains uncertain (111).

Diffusion tensor imaging (DTI) has been used to investigate the presence of white matter microstructural changes in older adult populations to characterise a pathological load which distinguishes between healthy, MCI and dementia populations. This type of technique relies on water molecules in neural tissue as a measure of the orientation and integrity of white matter tracks, being particularly sensitive in the detection of abnormalities (112). Whilst a meta-analysis of 41 studies completed by Sexton et al. (2013) (113) found confirmatory support for changes in white matter integrity in AD and MCI populations relative to controls, they also identified a number of variables that significantly influenced
the outcome of study findings. Cognitive, gender and age characteristics were considered particular confounds (113), with deterioration of white matter integrity associated with degree of cognitive impairment, the number of females included in the study and the use of older participants. Whilst these were not the only recognised variables, the weight given to white matter structural changes as part of a diagnostic process needs consideration in the context of the heterogeneity of the population in question.

Decreased hippocampal volume and increased neuronal and synapse loss have also been observed in MCI cases relative to normal controls, as well as, relationships between these structural changes, subjective cognitive complaints and objective findings (109). Further, given the recognised pathological processes in AD, atrophic changes in the mesial temporal lobe, together with burden of neurofibrillary tangles (NFT) and senile plaques, has also gained much research attention. Notwithstanding the importance of these biomarkers as possible predictors of MCI progression, confirmation regarding the burden/distribution of these pathological processes required to reach each transitionary phase remains elusive (110). Following on from their 2014 systematic review of the sensitivity and specificity of plasma and CSF Aβ as a diagnostic biomarker, Ritchie and colleagues concluded that the application of this measurement in a population of patients with MCI was of limited clinical utility (114). Additionally, these pathological processes can be present at post mortem in “normal” older adult subjects and the relevance of these markers in the course of other aetiological subtypes of MCI remains to be established.

Decreased metabolic activities, increased oxidative stress and inflammation, and changes in neurotransmitter systems have also been proposed as potential neuropathological markers
in MCI (109). Whilst the relationship between these processes and cognitive decline is less clear, correlations between cholinergic dysfunction and impaired neuropsychological test performances have been observed (110). Relative to healthy controls, those with a diagnosis of MCI have been found to have reduced levels of cortical acetylcholine esterase activity along with poorer results on memory measures (115).

1.3.2.4 Interventions for MCI

In accordance with the lack of consensus regarding diagnostic criteria, incidence and prevalence estimates, and variable etiological processes, the clinical utility and practical implications of a diagnostic entity such as MCI have been repeatedly challenged (116). As indicated, whilst neuropathological profiles are also being developed, much still remains to be done. Despite the uncertainties, there is clearly a subset of individuals who do go on to develop dementia, highlighting the importance of early identification and potential for the initiation of intervention.

Interventions for MCI typically take the form of pharmacologic and nonpharmacologic practices (see Tables 1.5 and 1.6 for a summary of key findings). Pharmacologic approaches can range from trials with cholinesterase inhibitors (medications typically prescribed for individuals with AD), to anti-inflammatory agents, hormone replacement therapy and various types of vitamin and herbal supplements (e.g. ginkgo biloba; vitamin E). The intent of these types of approaches is to minimise progression with a view to slowing, halting or reversing the underlying pathological processes (98). To date, no pharmacological application has been found to be effective in the treatment of MCI. It is
however recognised that prescription of medications such as cholinesterase inhibitors for individual’s with MCI is practiced to varying degrees around the world (116).

Behavioural interventions include psychosocial, cognitive and physical activity whereby the focus is on optimising well being and functioning, and minimising disability (117). Whilst there is an abundance of observational studies addressing, in particular, physical and cognitive activity interventions, few randomised controlled trials (RCT) have been conducted with substantial population sizes. Inconsistency in research findings has made generalisability of claims difficult and the clinical relevance of improvement on outcome measures remains questionable.

The Third Consensus Conference on the Diagnosis and Treatment of Dementia (2006, (118)) concluded that there was insufficient proof that pharmacologic interventions and nonpharmacologic therapies should be given serious consideration by physicians. This statement appeared largely based on decisions made regarding the outcome of randomised, placebo controlled studies, of which there are relatively few with MCI populations (118). However, a recent systematic review of 41 RCTs adjudged that there was no replicable evidence of effective interventions in MCI (119). Despite the controversies and methodological challenges, there does appear to remain some merit in targeting this population and addressing lifestyle factors that may reduce the risk of progression in this group of individuals.
Table 1.5: Proposed pharmacological interventions for MCI.

<table>
<thead>
<tr>
<th>Agent</th>
<th>Examples</th>
<th>Proposed Action</th>
<th>Study Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cholinesterase Inhibitors</strong></td>
<td>Donepezil, Rivastigmine, Galantamine</td>
<td>Increases the level and duration of action of acetylcholine which has been implicated in learning and memory.</td>
<td>Very little evidence in MCI that cholinesterase inhibitors improve cognition or affect progression to dementia. Given the side effects, the risk of adverse events reportedly outweighs any minor benefit. They should not be recommended for MCI (120) (121).</td>
</tr>
<tr>
<td><strong>Nonsteroidal anti-inflammatory drugs</strong></td>
<td>Naproxen, Aspirin, Celecoxib</td>
<td>Inflammatory changes in the brain of AD patients have been identified. These drugs may reduce the risk of developing AD.</td>
<td>No convincing evidence from RCTs or observational studies that these drugs reduce conversion and cognitive progression (122-125).</td>
</tr>
<tr>
<td><strong>Statins</strong></td>
<td>Simvastatin, Atorvastatin</td>
<td>Lower cholesterol; prevent cardiovascular disease and reduce cardiovascular risk factors associated with cognitive decline.</td>
<td>No differences observed in the rate of cognitive decline between users and nonusers of statins (126).</td>
</tr>
<tr>
<td><strong>Anti-hypertensives</strong></td>
<td>Beta-blockers; ACE inhibitors</td>
<td>Treat high blood pressure and reduce medical complications that can occur which can compromise cognition (e.g. stroke).</td>
<td>The recommendation is to treat elderly patients who are hypertensive, as further cognitive decline associated with cerebrovascular disease may be prevented (127).</td>
</tr>
<tr>
<td><strong>Estrogen Replacement Therapy</strong></td>
<td>Raloxifene</td>
<td>Estrogen affects brain blood flow, neurotransmitters and stimulates cell growth. It has been implicated in memory.</td>
<td>In early findings the risks outweighed the benefits (128). More recently studies suggest that further investigations are necessary (129).</td>
</tr>
<tr>
<td><strong>Nutritional</strong></td>
<td>Ginkgo biloba, Vitamins (B, E), Omega 3</td>
<td>Necessary for cell function, antioxidants and polyunsaturated fats have been associated with reduced risk of cardiovascular disease.</td>
<td>Findings inconsistent due to small participant numbers, short treatment periods and variable outcome measures. Minimal supportive evidence of improved performance on cognitive outcome measures (130-135).</td>
</tr>
</tbody>
</table>

Table 1.6: Proposed behavioural approaches for MCI.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Examples</th>
<th>Proposed Action</th>
<th>Study Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychosocial</strong></td>
<td>Visiting friends, going to clubs and church, volunteering</td>
<td>Builds cognitive reserve; Enhances quality of life by providing opportunity for stimulation and engagement.</td>
<td>Limited studies. Difficult to specifically identify benefits due to nature of behavioural interventions employed (107, 118, 136).</td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td>Education, mentally stimulating leisure activities, targeted interventions</td>
<td>Builds cognitive reserve; Enhances quality of life; Aids with the development of strategies for improving cognition and functional level.</td>
<td>Some suggestion of improvement on cognitive measures and trained tasks, though findings are inconsistent owing to methodological issues. The clinical relevance of enhanced performances remains uncertain (137-139).</td>
</tr>
<tr>
<td><strong>Physical</strong></td>
<td>Walking, dancing, aerobics</td>
<td>Reduces vascular risk factors; Increases brain neurotrophic factors; Enhances mood; Reduces beta-amyloid plaque formation.</td>
<td>Findings have been inconsistent. There is some support for enhanced cognition, though uncertainty remains (140, 141).</td>
</tr>
</tbody>
</table>
1.3.2.5 MCI: Summary and Implications

It is not surprising that the study of MCI has continued to grow somewhat exponentially particularly in the context of the implications that early diagnosis, intervention and management strategies may have on minimising disease burden, improving quality of life and reducing the economic costs associated with dementia. Whilst consensus towards the need for greater consistency in methodological approaches to the study of MCI populations appears to have been reached, key controversies and limitations remain within the field. These issues continue to centre on participant characteristics, the choice of test battery and normative criteria to establish diagnosis, and the nature and length of follow-up. Table 1.7 summarises these factors. It should be recognised that these issues are not specific to the study of MCI, although they have contributed to enhance uncertainty regarding the potential value of this diagnostic entity (useful or otherwise).

There does however appear to be a clear place for this population in intervention studies whereby longitudinal follow-up and repeated cognitive assessment can assist in quantitative documentation of change over time. Given that AD is the most common form of dementia and memory impairment presents as a hallmark feature of this disease process, identifying risk and protective factors for cognitive decline and specifically targeting memory dysfunction would appear particularly valuable components to concerted intervention efforts.
Table 1.7: Summary of key issues in the study of MCI.

<table>
<thead>
<tr>
<th>Factor and Key Features</th>
<th>Issues Still to be Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnosis/Incidence/Prevalence</strong></td>
<td></td>
</tr>
<tr>
<td>Applied Criteria</td>
<td>No firm consensus though criteria of -1.5SD is generally accepted. Use of domain versus</td>
</tr>
<tr>
<td>Study Population Demographics</td>
<td>multi-domain impairment has implications for progression.</td>
</tr>
<tr>
<td>Length of Follow-up</td>
<td>Partitioning of age groups e.g. young-old (65 to 69), old (70 to 84) and very old (85+).</td>
</tr>
<tr>
<td></td>
<td>Potential higher incidence in clinical settings and possible need to adapt criteria/assessment</td>
</tr>
<tr>
<td></td>
<td>techniques.</td>
</tr>
<tr>
<td></td>
<td>Should exceed 12 months; Evidence of decline quantitatively collected.</td>
</tr>
<tr>
<td><strong>Clinical Course</strong></td>
<td></td>
</tr>
<tr>
<td>Stable, Fluctuating, Reversible &amp; Progressive</td>
<td>Influences management, particularly in primary care. Guidelines for managing patients in</td>
</tr>
<tr>
<td></td>
<td>clinical practice need to address these factors.</td>
</tr>
<tr>
<td><strong>Neurobiology</strong></td>
<td></td>
</tr>
<tr>
<td>Structural, homeostatic, neuromodulatory</td>
<td>Progression towards standardisation of operational definitions of MCI, neuropathological</td>
</tr>
<tr>
<td>and neuropathological changes</td>
<td>protocols and their application to brain tissue banks.</td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
<td></td>
</tr>
<tr>
<td>Pharmacological Vs Nonpharmacological</td>
<td>Currently there are no prescriptive treatments for MCI. More rigorous RCT with larger</td>
</tr>
<tr>
<td></td>
<td>populations (multi-centre trials) and longer follow-up with consensus across standardised</td>
</tr>
<tr>
<td></td>
<td>outcome measures.</td>
</tr>
</tbody>
</table>
1.4 Risk and Protective Factors for Cognitive Impairment in Later Life

1.4.1 Introduction

The significance of preventive measures designed to delay the onset of dementia can be recognised by reviewing the statistics and costs associated with the disease process. If, in Australia, the average onset of AD was delayed by five months, there would be a 5% reduction in new cases each year. This would result in 3.5% fewer cases by 2020 and a cumulative savings of $1.3 billion (142). In Australia, deaths due to dementia has gone from the seventh leading cause of death in 1997 to the third in 2009 (143). Collectively, these statistics highlight the importance of recognising at risk populations and identifying strategies for delaying cognitive decline to effectively minimise disease burden upon health systems and the community.

A number of risk and protective factors for cognitive decline and dementia have been proposed. It was concluded from the systematic review of literature undertaken by the 2010 National Institutes of Health (NIH) - State-of-the-Science Conference on Preventing Alzheimer’s disease and Cognitive decline, that there was insufficient evidence to support any definitive recommendations to prevent AD or cognitive impairment related to advancing age. However the outcomes of these findings have been criticized with respect to an overly cautious interpretation of the research and additional systematic reviews would also appear to challenge conclusions from the 2010 meeting (106, 107, 144). Despite conflicts in the literature, recommendations and increased research with respect to lifestyle factors appears justified and supported. Notably, a review of seven potentially modifiable risk factors for AD conducted by Barnes and Yaffe, published in 2011(145), identified
significant numbers of preventative cases (up to 3 million worldwide) may be achievable with greater emphasis placed on public health initiatives with respect to lifestyle factors. Whilst more conservative estimates were reported in the follow-up paper by Norton et al. 2014 (a third as opposed to one half of AD cases worldwide), the potential for intervention to reduce disease burden remains high (146). As AD is the most common cause of dementia in individuals aged 65 years or over, the following section is focused on this condition, although the interplay between risk and protective factors is not necessarily specific to AD alone.

### 1.4.2 Non-modifiable Risk Factors

The strongest, non-modifiable risk factor for cognitive decline is old age. Beyond the age of 65 years, the prevalence of AD doubles every five years, with the rate of acceleration slowing down in very old age (147). In addition to age, relationships between genes and AD have been identified. Whilst mutations in the amyloid precursor protein (APP) gene and the presenilin 1 and presenilin 2 genes are rare, individuals who inherit one of these mutations will, in most circumstances, develop AD at a relatively young age (148). Nearly all individuals with Down syndrome will develop AD, with this postulated as being due to triplication of the APP gene (149). These autosomal-dominant mutations are in contrast with susceptibility genetic risk factors such as associations found between the apolipoprotein E – epsilon 4 allele (ApoE ε4) and AD. This relationship has been identified across a broad range of age and ethnic groups (147, 148, 150). Whilst this association also appears to be dose dependent, with those who are homozygous for the
allele presenting even higher risk than heterozygous individuals, possession of ApoE ε4, does not necessarily result in the development of AD (147, 148). For individuals who have a parent with dementia, the risk of developing the disease is also greater compared with the general population (4).

Women are at greater risk of developing AD than men (151). However, it is unclear what the mediating factor for gender related differences is, with hormonal, longer survival, and incidence of other disease states in men, having been proposed (147, 152).

1.4.3 Modifiable Risk Factors

Whilst ageing, genetics and gender are mechanisms that are not readily amenable to change, a number of modifiable lifestyle factors have also been identified as playing an important role in cognitive functioning. Research investigating relationships on lifestyle interventions as modifiable risk factors for cognitive decline and AD has been prolific. Although the scarcity of RCT casts doubt on the strength of conclusions drawn from observational studies (150), the consistency in the outcomes of the data, continue to make lifestyle factors promising intervention targets (4, 106, 144).

Cardiovascular risk factors for dementia include hypertension, dyslipidaemia, diabetes and smoking (107, 145, 147). Whilst traditionally considered predictors for VD, a role for cardiovascular risk factors in AD is accepted (153). Diabetes (namely type II, which is the most common form) nearly doubles the chances of developing cognitive dysfunction, and
dementia risk in late life is also increased if there is a history of midlife hypertension or hypercholesterolemia (107). Encouraging results from clinical trials indicate that treating hypertension reduces the incidence of dementia (127, 144). Smoking was initially considered a protective factor, however further reviews of cohort studies, have subsequently identified this lifestyle habit to place individuals at increased risk for AD (144). In a series of studies with older smokers and non-smokers, Almeida and colleagues identified that smoking resulted in a loss of gray matter density in the brain, together with cognitive decline (154, 155).

Links between cognition and diet remain somewhat inconclusive. Consumption of a Mediterranean diet and high intake of antioxidants and polyunsaturated fatty acids has been associated with a decreased risk of cognitive decline, though the relationship between incident dementia and cognitive outcomes would appear, at best, inconsistent (156-159). The use of supplements, such as vitamins (C, E, B6, B12) and folate as preventative measures has also been proposed in accordance with hypotheses regarding the anti-oxidant and homocysteine lowering properties of these vitamins. Again, further controlled trials are needed to establish the potential effects on dementia risk (107, 160). Research and systematic reviews investigating associations between alcohol consumption and cognitive decline are somewhat conflicting. No association, protective effects, and risk for cognitive decline have all been reported, however such appears highly dependent on the method of assessment of drinking behaviours, the cohort studied, and the nature of the dementia process in question (150, 160-163).
Substantial support for the protective benefits of physical activity is evident in the research literature. Lower incidence of AD has been reported in physically active individuals, together with enhanced cognitive performance with the introduction of exercise interventions (164-166). These outcomes have been observed in a range of studies (prospective cohort; case control and RCTs), although the mechanisms by which physical activity influences cognition remain largely unknown. Proposed aetiologies have included modifications of brain derived neurotrophic factor (BDNF – a protein influential in nerve growth which is prevalent in areas of the brain considered important for learning and memory) and vascular risk factors, as well as the possibility of reducing β-amyloid plaque formation (an AD biomarker) (107). Despite uncertainty regarding the exact underlying mechanisms contributing to enhanced cognition, and the limited number of RCTs investigating the role of physical activity, it is an easily modifiable lifestyle option (106).

The importance of engaging in a socially enriched lifestyle has also been reinforced by studies reporting that individuals involved in regular social engagements, such as outings, visiting friends and volunteering, are at decreased risk for developing dementia (167, 168). However disentangling the influences of additional factors which often coincide with social activities (e.g. mental stimulation; physical activity) is difficult and diverse associations (e.g. marital status, type of social network) have confounded the interpretation of some of the observational data (160, 169). Whilst the benefits of social engagement seem understandable, further evidence is required.
An additional modifiable lifestyle factor which has received considerable attention is mentally stimulating activity in the form of leisure pursuits, and the influences of educational and occupational attainment.

1.4.4 Mental Stimulation and Prevention of Cognitive Decline

The mechanism by which intellectual and mental activity protects against dementia is unclear and major gaps exist in the knowledge base of this topic. Prominent in discussions are the terms “brain reserve” and “cognitive reserve”. The former concept evolved from early observations between the degree of brain pathology and the clinical symptoms that individuals presented with prior to death, revealing individual differences in ability to tolerate the effects of disease (170). A number of interrelated models have been proposed to define “reserve” and this seems to be shaped by various factors including genetic, environmental and lifestyle characteristics. The concept of “cognitive reserve” has commonly been used when discussing the relationship between participation in cognitively stimulating activities and its protective effects from dementia (171).

Cognitive reserve, refers to the efficient use of neural networks to maintain function (171). A higher cognitive reserve purportedly equates to a greater functional proficiency in the presence of pathological damage, by being more resourceful at optimising alternate brain networks. Aspects of life experience may provide the individual with a set of skills or repertoires and more adaptable capacity for using alternate networks or strategies. This in turn, supposedly allows the person to better cope with pathology burden, effectively
delaying the onset of the clinical manifestations such as dementia (171, 172). Consistently strong associations between educational and occupational attainment and dementia (173) presents a detailed review) have been demonstrated, with epidemiological studies revealing that individuals with higher levels of achievement in these domains have lower risk of developing AD. Participation in mentally stimulating leisure activities has also been proposed as a way of buffering cognitive decline, either by maintaining or enhancing cognition in later life.

Support for the protective and beneficial effects of mental activity on cognition has come from a number of research areas and is often used to corroborate the “mental exercise” or “use it or lose it” hypothesis (174). For example, studies with mice have demonstrated the protective effects of enriched environments on learning and memory deficits, and their positive influence on reducing disease pathology (175, 176). Imaging studies of the brain (e.g. PET scans and MRI scans) have also shown that being mentally active is likely to be of benefit. People with enriched lifestyles and higher levels of leisure activity tend to be less affected by the early signs of AD (177). That is, they may show significant pathological changes associated with the disease process (e.g. brain atrophy), yet continue to demonstrate intact cognition and functional capacity. Similarly, a direct relationship was observed between the size of the hippocampi and the amount of taxi driving experience in a study of male London drivers (aged 32-62) (178). Taxi drivers had a larger posterior hippocampus compared with similarly aged people who were not taxi drivers and those drivers with the most experience demonstrated the greatest hippocampal structural changes (178).
Many observational studies with older adults have identified a relationship between frequent participation in stimulating leisure activity and better cognitive performances. For example, in a study of more than 5000 Chinese residents aged 55 years and over, participation in activities such as reading and playing board games (especially Mahjong) was associated with reduced risk of cognitive impairment. Mental stimulation appeared the more important factor rather than simply being socially or physically active (179).

In Chicago, 4000 older adults were monitored over a five-year period - more frequent engagement in mentally stimulating activities was associated with less cognitive decline (180). This relationship has also been found in studies of people at risk of dementia (such as those with MCI) and those who already have dementia (181-185). The effects of mental stimulation throughout life have also been investigated, with results suggesting that participation in activities across the lifespan plays a role in better cognitive performances (186).

Wilson and colleagues have published a considerable amount of research investigating the potential influences of pre-morbid leisure activities and cognitive decline in AD (180, 182, 187-189). Whilst consistently supporting proposed benefits of leisure activity for reducing the risk of cognitive decline, more recently they have concluded that engagement in cognitive activities minimises the proportion of time spent in a state of dementia. Participation effectively delays the onset of the clinical expression of dementia, with more rapid progression experienced post onset (190).
In a prospective cohort re-examined every two years until the 20-year follow-up since 1988, Foubert-Samier and colleagues analysed data from 805 subjects at the 10th year of follow-up. Details on engagement in 10 leisure and social activities were collected, with findings suggesting a potentially beneficial role of these activities with regard to rates of cognitive decline and dementia. Even individuals whose level of activity did not increase until advanced age, were found to be at reduced risk of dementia (191). This result was in contrast to the outcomes obtained in a 15-year prospective study which found little support for the protective effects of engagement in leisure activities against dementia (192).

Finally, in their review of longitudinal studies with a follow-up time of at least two years, published across a 20-year span (1991 to 2011), Wang et al. (2012) concluded that whilst the protective effect of mental activity on cognitive decline had been consistently reported in both observational and interventional studies, findings were less convincing across the latter.

Whilst the findings from observational studies are encouraging, the topic is not without its controversies and critical evaluation of the research reveals a number of methodological limitations. These include the specific nature of some of the participant cohorts, the psychological tests used, and the complexity associated with identifying and defining a broad range of leisure activities with regard to type and degree of cognitive stimulation. Whilst higher educational attainment has been associated with reduced cognitive decline, it has been argued that this is a product of the strong correlation between higher education and stronger cognitive performance at outset, rather than a true association between
education and cognitive decline with time (193). Additionally, studies with certain
populations (e.g. chess players, musicians, academics, doctors) have found no enhanced
effects on cognitive performance in areas outside the specific field of expertise (174).

There are inherent difficulties in establishing a causal relationship between the effects of
mentally stimulating leisure activity and cognitive function. Is it that the engagement in
cognitively demanding activity enhances cognition, or do individuals with higher levels of
cognitive ability seek mentally stimulating environments and activities (180)? Is there a
particular time in the lifespan when mental activity is most likely to have protective effects?
In their critical evaluation of research literature evaluating the role of leisure activity in
preventing dementia, Stern and Munn (2010) (194) concluded that the evidence available
was not strong enough to infer causal relationships nor to convincingly support one form of
activity over another.

Contrasting the day-to-day types of stimulation that people engage in when awake are
cognition-focused interventions (CFI). These types of interventions may be grouped
according to three categories - cognitive stimulation, cognitive rehabilitation and cognitive
training (117). However, the terms, as well as the nature of the activities, are often used
interchangeably in the literature. CFI attempt to capitalise on intact domains to help
maintain cognition and prevent/delay decline. These techniques have also been employed
to increase functional independence and reduce caregiver burden (117).
Consensus regarding the most effective techniques for enhancing cognition remains equivocal. Difficulty in establishing the benefits of engaging in CFI have been compounded by differences in study methodology and participant populations, varied intervention techniques implemented across diverse time frames, and the adoption of a broad number of outcome measures (or lack thereof in some instances). These factors have restricted the application of meta-analytic techniques when systematically reviewing the literature, with discordant conclusions regarding the value of CFI for reducing cognitive decline and the risk of dementia (195-197).

A summary of these issues is presented in section 1.5 – a paper published in the journal Australasian Psychiatry in 2011. A table of the systematic reviews published from 2003 to 2014 summarising the evidence supporting a role for CFI in healthy older adults and those diagnosed with MCI and/or dementia follows in section 1.6. Limitations and potential implications in this research area are presented in section 1.7, and this section also sets the scene and rationale for the Promoting Healthy Ageing with Cognitive Exercise (PACE) Study.
1.5 Cognition-Focused Interventions for Older Adults

This chapter was published in the journal Australasian Psychiatry:


1.5.1 Abstract

The objective of this paper is to review and discuss the evidence supporting the use of cognition-focused interventions to enhance mental function and decrease the risk of dementia. A non-quantitative review of existing evidence supporting the use of cognitive stimulation, rehabilitation and training in enhancing mental function and decreasing the risk of dementia in later life was undertaken. Despite growing popularity, there is limited evidence from randomized trials to support the use of cognition-focused interventions to decrease the rate of cognitive decline associated with increasing age or with dementia.

There is currently no evidence available from randomized trials to support the use of cognition-focused interventions to prevent dementia. Sufficiently powered randomized trials of cognition-focused interventions designed to prevent dementia and limit the progression of cognitive decline in later life are needed before these programs are adopted in normal routine clinical practice.
1.5.2 Introduction

In 1999 Dr. William Sunderman was still working from 8 am to 4 pm editing a medical journal at the Institute for Clinical Science at Pennsylvania Hospital in Philadelphia. He was a man of much energy and many talents – a poet, a scientist, a leader who worked to improve the standard of pathology practice and a violinist good enough to play at Carnegie Hall. Perhaps the most striking thing about him was that in 1999, while working his 40 hour week, he was 100 years old.

Few would be unfamiliar with the adage “use it or lose it”, and cases such as Dr. Sunderman’s add credence to the belief that regular engagement in mental activity or intellectual stimulation assists in the maintenance of cognition. Animal (198-200), neuroimaging (201, 202) and observational studies have consistently identified an association between enriched environments, enhanced cognition and reduced risk of dementia in later life (203-205). Whilst such findings are generally consistent, causal links have not been firmly established, in part reflecting uncertainty regarding the pathological processes, the interplay between environment, lifestyle and genetic factors, and the degree to which cognitive benefits are ameliorated by time-points of activity across the lifespan.

1.5.3 Mental Activity and Cognition-Focused Interventions

Life experience (educational and occupational factors) and leisure pursuits (e.g. mah-jong, reading, learning a language) are examples of mental activity. In contrast to the day-to-day types of stimulation that people engage in when awake, are cognition-focused
interventions. Typically grouped into one of three categories - cognitive stimulation, cognitive rehabilitation and cognitive training (206), the terms, as well as the nature of the activities, are often used interchangeably in the literature.

1.5.4 Cognitive Stimulation

Cognitive stimulation (CS) emphasises the benefits of group activities that, dependent on the target population and objectives, can range from education, discussion and debate, and problem solving, to reality-orientation, reminiscence and validation therapy. Adopted in 2006 as part of the National Institute for Health and Clinical Excellence (NICE) guidelines (207), CS therapy has been recommended as the treatment of choice for individuals in the early stages of dementia (Mini Mental State Examination – MMSE, score ≥ 20). Improved cognitive performances and quality of life scores have been reported in people with dementia that undergo CS (208) and research into the cost-effectiveness of this type of intervention has also been undertaken (209). Despite favourable indications, few randomised trials of CS have been published to date and the research regarding the use of this type of intervention for cognitively healthy older adults at risk for dementia is also extremely limited. Further, the relationship between the activities and expected results across outcome measures is not clearly defined. This appears to reflect the lack of grounding of the intervention in theoretical models of neuropsychology and the limitations associated with activities not being tailored to meet personal needs (210). There is also concern that the trial that was used to support the introduction of the NICE guidelines may have mistakenly reported as improvement what was in reality a deterioration of scores on
the ADAS-cog (a commonly used scale to measure cognitive function in trials of people with Alzheimer’s disease) (208).

1.5.6 Cognitive Rehabilitation

Cognitive rehabilitation (CR) focuses on the identified needs of the individual, with consideration given to specific areas of impairment, and an emphasis on improving everyday skills. It aims to optimise functioning and well being, minimise disability and enhance the individual’s self efficacy and coping skills. Goals are often considered in light of the level of cognitive impairment, and outcome measures are chosen to specifically capture the rehabilitation focus. Individuals with dementia seem to benefit from this form of intervention, with numerous case-studies suggesting that the use of techniques such as spaced retrieval and vanishing cues, improves learning of names, reduces repetitive behaviours and enhances certain aspects of function (211-213). CR results are encouraging, although data from sufficiently powered randomised trials are still lacking. In addition, the success of CR is influenced by factors such as motivation, practice, program duration, third party involvement (e.g. family member; carer) and the ability of the intervention to adapt to the changing needs of the individual (214).

1.5.7 Cognitive Training

Cognitive training (CT) involves a set of standardized, repeatedly performed tasks, designed to enhance, or at a minimum, maintain a particular set of cognitive functions. CT interventions have been employed with a range of participant populations, utilising various
techniques and applications (e.g. individualised versus group; pencil/paper versus computer). One of the largest and most frequently cited studies with healthy older adults is the ACTIVE trial (215), which recruited 2832 community dwelling individuals aged 65 to 94 years. In this randomised controlled trial (RCT), participants were trained in one of three different interventions: memory, processing speed and reasoning. Whilst participants improved their performance on trained tasks, the effects of the intervention failed to generalise beyond the trained domain [14]. Cognitive improvements dissipated over time, though some gain was still detectable five years later (216). Despite the reasoning group reporting significantly less difficulty in undertaking instrumental activities of daily living than the control group at the long term follow-up, there continued to be no demonstrable effects on outcome measures assessing functional capacity.

It is not surprising that healthy older adults have the capacity to improve performance with CT and this has been demonstrated in other trials measuring speed of information processing, memory and executive functions (217-219). Even older adults with Mild Cognitive Impairment (MCI) show gains upon trained tasks (220). The main criticisms of this type of intervention are that these programs do not necessarily focus on the needs of the individual and gains made by participants tend to be task specific, with little transfer of training to other domains. A recent challenge to this assumption has come from Ball et al (221) who reviewed sets of data collected from the ACTIVE trial and studied the effects of CT on subsequent motor vehicle collisions (MVC) in older drivers. They concluded that those participants who had undergone speed of processing and reasoning training were
involved in a lower number of at fault MVC than controls over a six year period, suggesting a possible role for CT in enhancing driver safety (221).

1.5.8 Conclusion

Currently, available evidence in support of the use of CS, CR and CT to prevent cognitive decline in later life is scant. CS therapy may have the potential to enhance cognition and well-being in older adults with dementia, yet long-term maintenance effects remain uncertain. CR techniques are well established and can be used to improve cognition in discrete areas, though the cost effectiveness and access to suitably trained therapists creates limitations with respect to the availability of resources and their usefulness in improving function. CT programs improve performance on trained tasks (with potential long-term maintenance of gains) though the transfer of effects to other day-to-day activities appears limited. In instances whereby gains have translated into improved performance in everyday life, the underlying component of the trained tasks tends to closely mimic the cognitive skill set utilised in performance.

Despite persuasive evidence that cognition may be enhanced with specific interventions, there is not yet a definitive answer as to whether engaging older adults in these forms of activities provides a protective mechanism or “buffer” against cognitive decline, particularly in domains other than those that have been trained. It also remains to be seen whether the use of cognition-focused interventions in vulnerable populations (e.g. those with MCI) can reduce the risk of dementia, or if the application of these types of strategies
can slow down the trajectory of the disease process. Difficulties in establishing the benefits of engaging in cognition-focused interventions has been compounded by differences in study methodology and participant populations, varied intervention techniques implemented across diverse time frames, and the adoption of a broad number of outcome measures (or lack thereof in some instances). These factors have limited the application of meta-analytic techniques when systematically reviewing the literature, with subsequent varied conclusions regarding the potential of cognition-focused interventions for reducing cognitive decline and the risk of dementia (195, 222, 223).

What does this all mean for consumers? Australia has yet to adopt “brain fitness programs” as standard practice in residential facilities, yet this burgeoning and unregulated million dollar industry continues to expand, fuelled by media interest in brain health and consumer concern regarding memory loss and dementia. An article published on-line in the journal *Nature* (224) generated considerable debate regarding the merits of commercially available brain training programs. The authors conducted a six-week, online study, in which participants trained several times each week, in their own home, on tasks designed to improve reasoning, memory, planning, visuo-spatial skills and attention. Improvements in performances were limited to the cognitive tasks upon which the individual was trained, with no reported evidence for transfer effects to untrained tasks. Whilst this has been used as evidence of a lack of empirical support regarding the benefits of these programs in the broader population (225), the study has drawn criticisms with respect to its methodology, with high dropout rates of participants and the use of questionable outcome measures (226, 227).
There is currently no cure and no effective way of preventing dementia. As the market for computerized “brain boosting” programs explodes and vulnerable consumers expend time and finances in commercial products that may provide limited benefit, clinicians find themselves in uncertain territory concerning how best to advise their patients.

“Prescriptive” information regarding what to do remains elusive. Older adults (cognitively intact or otherwise) should be encouraged to engage in regular stimulating activities that are moderately challenging, motivating and interesting. What is best for the individual might only be appropriately determined by baseline neuropsychological assessments, identifying strengths and weaknesses, and the implementation of a personalized regime targeting fragile cognitive domains. Including carers/companions in the rehabilitation/training process to ensure ongoing and regular implementation of learnt strategies may also be necessary and combining both individualized home programs with the social components of group environments may further optimize cognitive enrichment, particularly with respect to influencing mood and well-being.

A “one type fits all” approach may well be unsatisfactory and part of the underlying reason as to why, after years of research, there is still no compelling evidence to support the systematic use of CS, CR, and CT in clinical practice. Nevertheless, lack of evidence is not the same as evidence of lack of an effect. We continue to wait with anticipation for the results of sufficiently powered randomized trials of cognition-focused interventions designed to prevent dementia and limit the progression of cognitive decline in later life.
1.6 Published Systematic Reviews of Cognition-Focused Interventions

Table 1.8 includes summary information from recently published systematic reviews attempting to clarify the position on the benefits of CFI. In each of these papers, the concluding comments of the authors were of a similar vein. Analysis of the data was complicated and confounded by methodological issues, effect sizes were often small and the generalizability of the obtained findings questionable.

Importantly, and despite some of the limitations, there were no reported adverse effects of CFI, apart from economic. That is, the lack of significant effects also implied that there were no detrimental consequences of participation. Notably, the balance of study populations was heavily weighted towards those with dementia, or healthy participants, with MCI the smaller of the groups studied.
Table 1.8 Published systematic reviews of cognition-focused interventions.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Eligibility Criteria used in Paper</th>
<th>Population</th>
<th>Reported Outcome/Conclusions by Authors</th>
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<tbody>
<tr>
<td>Reijnders et al. (2013) (137)</td>
<td>• RCT</td>
<td>Healthy and MCI</td>
<td>Whilst these interventions were considered effective in improving objective cognitive performances, the generalisability of the effects to day-to-day functioning remains unclear.</td>
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<td></td>
<td>• Intervention</td>
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<td></td>
<td>• Outcome measures</td>
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<tr>
<td></td>
<td>• 2007 to 2012</td>
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<tr>
<td>Bahar-Fuchs et al. (2013)</td>
<td>• RCT</td>
<td>Dementia (AD or VD)</td>
<td>Meta-analysis performed only with CT. No differences between CT and control conditions on any outcome measures. Authors commented on definitions of CFI, together with methodological factors which may account for lack of significant effects.</td>
</tr>
<tr>
<td>(Update from 2003 Cochrane Review) (228)</td>
<td>• Intervention</td>
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<td></td>
<td>• Outcome measures</td>
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<td></td>
<td>• 2006 to 2012</td>
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<tr>
<td>Woods et al. (2012) (229)</td>
<td>• RCT</td>
<td>Dementia</td>
<td>Cognitive benefits evident in people with mild to moderate dementia over and above medication effects. Methodological issues across studies; few included data from longer term F/Up.</td>
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<tr>
<td></td>
<td>• Intervention</td>
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<td>• Outcome measures</td>
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<td>Eligibility Criteria used in Paper</td>
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<tr>
<td></td>
<td>Computerised intervention</td>
<td>Healthy</td>
<td>Authors concluded that computerised CT was promising for improving cognitive abilities in normal community dwelling older adults. Effect sizes were considered comparable to more traditional approaches to CT. Significant variability in training techniques and protocols made it inappropriate to conduct a meta-analysis of the effect sizes.</td>
</tr>
<tr>
<td>Kueider et al. (2012) (230)</td>
<td>Outcome measures</td>
<td>CT (neuropsychological software, video games)</td>
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<td></td>
<td>Publications prior to 2011</td>
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<td></td>
<td>Diagnosis using (Petersen’s MCI-A criteria)</td>
<td>MCI (amnestic)</td>
<td>Some evidence for the benefit of CFI in this population with learning of new information and strategies. Positive effects on daily activities and subjective measures of memory, mood and quality of life. Variability in long-term maintenance of effects. Low generalisation on objective measures for computer based training.</td>
</tr>
<tr>
<td>Simon et al. (2012) (231)</td>
<td>Intervention</td>
<td>20 2 x CR; 14 x CT; 2 x CR/CT; 2 x CS/CT</td>
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<tr>
<td></td>
<td>Outcome measures</td>
<td>1990-2011</td>
<td></td>
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<tr>
<td></td>
<td>RCT</td>
<td>Dementia</td>
<td>Authors aimed to identify which neuropsychological domains would be improved in mild to moderate dementia. Poor quality of studies, limited sample sizes and differing modes of delivery meant that no conclusions could be drawn regarding domain improvement.</td>
</tr>
<tr>
<td>Spector et al. (2012) (232)</td>
<td>Mild to moderate dementia</td>
<td>18 11 x CT; 7 x CS</td>
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<td>Interventions</td>
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<td>Outcome measures</td>
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<td>Reference</td>
<td>Eligibility Criteria used in Paper</td>
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| Martin et al. (2011) (233) | - RCT  
- Peterson criteria for MCI  
- Intervention  
- Outcome measures  
- 1970-2007 | Healthy or MCI  
- 36  
- 33 x Healthy  
- 3 x MCI  
- CT | Observed effects across treatment and active control groups were equivalent. Therefore, despite improvement, such cannot be attributable to the specific intervention. |
| Kurz et al. (2011) (234) | - RCT  
- Diagnosis  
- Intervention  
- Outcome measures | MCI  
- 6  
- 1 x CS; 5 x CR/CT | CS – potential for enhancing cognition on global measures (e.g. ADAS-Cog; MMSE). Effect size was small though comparable to effects of cholinesterase inhibitors.  
CR/CT – no effect on general cognitive ability. |
| Jean et al. (2010) (235) | - Diagnosis using Petersen’s MCI-A criteria  
- Outcome measures  
- 1975-2009 | MCI (amnestic)  
- 15  
- CS/CR/CT | Some degree of statistically significant improvement was noted across either objective or subjective measures of memory, quality of life and mood. The degree of improvement was not as convincing on objective measures of cognitive domains. |
<table>
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<tr>
<th>Reference</th>
<th>Eligibility Criteria used in Paper</th>
<th>Population</th>
<th>Reported Outcome/Conclusions by Authors</th>
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<tbody>
<tr>
<td>Faucounau et al. (2010) (236)</td>
<td>• Intervention • Outcome measures • 1971-2008</td>
<td>MCI</td>
<td>Both types of training referred to as “promising” with respect to improving cognition, subjective memory complaints and mood. Computer based CT was considered more advantageous.</td>
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<tr>
<td>Papp et al. (2009) (197)</td>
<td>• RCT • Intervention • 1992-2007</td>
<td>Healthy</td>
<td>Effect sizes generally small and largest when outcome measures reflected training task. Significant limitations of the research data in this population is commented on.</td>
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<tr>
<td>Vink et al. (2009) (237)</td>
<td>• RCT • Intervention • Outcome measures • 1887-2007</td>
<td>Dementia</td>
<td>Studies of poor quality and therefore a role for music therapy in the treatment of older adults with dementia is unable to be established.</td>
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<tr>
<td>Valenzuela &amp; Sachdev (2009) (196)</td>
<td>• RCT • Intervention • Outcome measures • F/Up &gt;3mths • Age&gt;50yrs</td>
<td>Healthy</td>
<td>CT – improves performance in healthy older adults on trained tasks. Suggestion that 2-3 months of CT may have persistent protective effects. Inconsistent findings regarding transfer of effect to non-trained tasks.</td>
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<tr>
<th>Reference</th>
<th>Eligibility Criteria used in Paper</th>
<th>Population</th>
<th>Reported Outcome/Conclusions by Authors</th>
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<tbody>
<tr>
<td>Woods et al. (2009)</td>
<td>• RCT and quasi-randomised trials&lt;br&gt;• Outcome measures&lt;br&gt;• Age &gt;55yrs</td>
<td>Dementia</td>
<td>Potential benefits for RT with improvements in cognition and mood. Caregiver burden was reduced. More RCTs needed.</td>
</tr>
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<td>(238)</td>
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<tr>
<td>Miotto et al. (2008)</td>
<td>• RCT&lt;br&gt;• Outcome measures&lt;br&gt;• 2002-2007</td>
<td>Memory Complainers</td>
<td>Authors concluded that neuropsychological rehabilitation employing errorless learning techniques was recommended for elderly populations with cognitive complaints, MCI and preclinical dementia.</td>
</tr>
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<td>(239)</td>
<td></td>
<td>MCI/Healthy</td>
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<td>MCI</td>
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<td>MCI/Dementia</td>
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<td>CT</td>
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<td>CT</td>
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<td>CT</td>
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<td>Reference</td>
<td>Eligibility Criteria used in Paper</td>
<td>Population</td>
<td>Reported Outcome/Conclusions by Authors</td>
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<tr>
<td>Sitzer et al (2006) (240)</td>
<td>Control condition present</td>
<td>AD</td>
<td>In general a small effect size was observed for cognitive interventions in populations with AD, though the range of effect size was highly variable and influenced by the nature of the study, domain of functioning assessed and type of rating (subjective vs informant vs cognitive performance).</td>
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<td></td>
<td>Outcomes measures</td>
<td>9</td>
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<tr>
<td></td>
<td>Effect sizes able to be calculated</td>
<td>6 x CT; 3 x CS</td>
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<td>1940-2004</td>
<td>Moderate Dementia</td>
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<td></td>
<td>AD</td>
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<td></td>
<td></td>
<td>4 x CS/CT; 3 x CS; 3 x CT</td>
<td></td>
</tr>
<tr>
<td>Clare &amp; Woods (2003) (195)</td>
<td>RCT</td>
<td>AD or VD</td>
<td>No significant effects found for CT. Methodological issues and lack of RCTs impacted on conclusions able to be drawn.</td>
</tr>
<tr>
<td></td>
<td>Participants had AD or VD</td>
<td>9</td>
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<td></td>
<td>MMSE &gt;12</td>
<td>7 x CT; 2 x CS</td>
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<td>Intervention</td>
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<td>Outcome measures</td>
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<td>Reported Outcome/Conclusions by Authors</td>
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<tr>
<td>Grandmaison &amp; Simard (2003)</td>
<td>AD</td>
<td>AD</td>
<td>Sample sizes very small; Studies lacked statistical power. 61.1% of the studies reported task trained specific improvements. Studies failed to measure generalisation to other tasks or cognitive domains or with respect to quality of life. More RCTs needed.</td>
</tr>
<tr>
<td>(241)</td>
<td>Interventions</td>
<td></td>
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<tr>
<td></td>
<td>Outcomes</td>
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<td></td>
<td>1887-2001</td>
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</table>

MCI= Mild Cognitive Impairment; ADL= activities of daily living; MMSE=Mini Mental State Exam; ADAS-Cog= Alzheimer’s disease assessment scale – Cognitive; RCT=randomised controlled trial; CFI=cognition-focused interventions; CT=cognitive training; CR=cognitive rehabilitation; CS=cognitive stimulation; AD=Alzheimer’s disease; VD=vascular dementia; MMSE=mini mental state examination; RT=reminiscence therapy; F/U= follow-up
1.7 Aims and Hypotheses

1.7.1 Summary

Dementia is one of the most frequent age related health problems of older people and one of the leading causes of years of life lost due to disability in Australia. MCI in old age is considered an important clinical state potentially predictive of future cognitive decline and dementia. There is increasing evidence that the onset of dementia may be delayed by the successful targeting of potentially modifiable risk factors. In older adults, frequent participation in mentally stimulating activities has been associated with stronger performances and reduced risk of dementia. Further, the rate of cognitive and functional decline can be influenced by cognitive intervention strategies.

However, as with studies looking at the relationship between leisure activity and cognitive decline few RCT utilising CFI techniques are available. Additionally, the diversity in the methodology, comparison conditions and outcome measures employed, have made it difficult to generalise the relative effectiveness associated with such interventions. Currently, there is no conclusive evidence to suggest that one type of intervention is better than another and the long term benefits/effects of such programs remain unclear. Furthermore, few studies with sufficient sample sizes, have rigorously tried to address these issues in individuals with MCI.

Despite an increasing amount of published research in the area of CFI, the heterogeneous nature of the studies has made it difficult to draw definitive conclusions regarding the benefits of these forms of intervention and many gaps in our knowledge remain.
Additional studies with larger MCI populations, utilising an appropriate control group, together with sound and varied outcome measures is necessary. Follow-up beyond an initial intervention time frame is pivotal in clarifying prognosis. Analysis of the acceptability of the chosen intervention is also pertinent to ensure the sustainability of any devised programs. The Promoting Healthy Ageing with Cognitive Exercise (PACE) study, sought to address these outstanding issues and to provide greater clarity regarding prescriptive recommendations for the management of clinical populations with MCI.

1.7.2 Aims of the PACE Study

The focus of the PACE study was on clarifying the effects of a program of cognitive activity (CA) strategy training on delaying cognitive decline in a group of older adults with MCI. The RCT was devised incorporating a five-week experimental CA strategy training program based on aspects of CT, CR and CS methods, each of which have been found to influence cognition and quality of life, though their benefits have not yet been extensively studied with individuals with MCI. To this end, participants were provided strategies and coaching to promote cognitive functioning. An educational “control” group were offered a five-week program of more generalised presentations on healthy ageing and retirement. The cognitive performances, quality of life and functional level of both groups were monitored across multiple time points.
1.7.3 Hypotheses of the PACE Study

It was hypothesised that older adults with MCI randomised to an intervention of CA strategy training would experience less cognitive decline, as measured by a standardised global test (CAMCOG-R), over a 12-month period, than participants randomised to a control education intervention.

Following the acquisition of additional funding (secured post the first recruitment phase), the length of the trial was extended and participants were invited to remain in the study for a further 12 months. This resulted in a 24-month data collection point and longer period of follow-up with additional opportunity to monitor cognitive change over time.

It was also predicted that the CA group would demonstrate stronger performances than the education group on secondary outcome measures of memory, attention, processing speed and executive functions across all time points. Further, inspection of responses on self-report questionnaires across both groups of participants would provide insight into the degree to which each of the intervention programs influenced different lifestyle aspects and well-being.
1.8 Thesis Outline

Chapter Two presents the study methodology, which was published in the journal Trials. Supplementary materials including information submitted to the Ethics Committee, tests, and information regarding the assessment processes are included in Volume 1, Appendices B and C. The manualised content of the sessions, together with handouts provided to participants are also appended (Volume 2, Appendices A to E).

Chapter Three - Presents the results describing the fidelity assessment undertaken and the acceptability of the intervention used in PACE. This paper was published in International Psychogeriatrics. Supplementary material, including an example of the ratings template used, are included in Volume 1, Appendix D.

Chapter Four - The results of the trial have been published in the American Journal of Geriatric Psychiatry and this paper (see Volume 1, Appendix A), forms the basis of Chapter Four.

Chapter Five - The closing chapter discusses and summarises the outcomes of the study, the theoretical implications and strengths and limitations. Directions for future research will also be highlighted, together with concluding comments.
CHAPTER 2

STUDY POPULATION AND METHODOLOGY
CHAPTER 2: STUDY POPULATION AND METHODOLOGY

2.1 Introduction

Chapter Two describes the background to the development of the Promoting Healthy Ageing with Cognitive Exercise (PACE) study and its design. The recruitment of participants and the processes involved in identifying suitable candidates with mild cognitive impairment (MCI) is reviewed, together with matters pertaining to the data collection and use of outcome measures. A detailed description of the program intervention is also included. The chapter concludes with information regarding the statistical methods employed and how the ethical treatment of participants was ensured. The PACE study methodology was published in the journal TRIALS in 2009 (see Volume 1, Appendix A). What follows is a more comprehensive discourse of this publication.
2.2 Study Population

2.2.1 Background

Members of our working group had undertaken research investigating the benefits of physical activity on memory in older adults with MCI before we considered designing PACE. A comprehensive review of the literature investigating additional preventive approaches for the management of MCI identified developments in the area of cognitive-based interventions. In late 2006, eight individuals with MCI, aged 60 years and over, were invited to attend a one-hour discussion over morning tea. This consumer focus group was provided with opportunity to offer their opinions regarding the development of a program of cognitive activity (CA) strategy training, specifically designed for older adults with mild memory problems. They were asked a series of questions about their current levels of participation in leisure activities, the types of activities they would like to engage in and the value of group versus individual participation. The group confirmed their interests in this form of research and provided feedback with respect to the elements that should be incorporated into an intervention. The general consensus was that any CA training program needed to be challenging, personally stimulating and have a social component.

In February 2007 the CA and educational interventions forming the basis of the PACE study were piloted with 10 participants with MCI (five allocated to each intervention) aged 65 and over. These individuals attended the Western Australia Centre for Health and Ageing (WACHA) at Royal Perth Hospital (RPH) on a daily basis over a two-week period and provided systematic written feedback regarding the session materials. The proposed
interventions were well received, with positive feedback regarding the relevance of the content/material, format and delivery style. The education group described the program as “useful” and “informative” and the CA group, “encouraging” and “practically helpful”. After collating feedback, additional minor modifications were made to the study protocol and recruitment began.

2.2.2 Participants

2.2.2.1 Recruitment of Older Persons

Participants were community dwelling volunteers from the Perth metropolitan area recruited from various sources such as memory clinics, local media and other ongoing research studies. Potential participants were initially screened with a semi-structured interview over the telephone and invited to visit the WACHA for a more detailed screening assessment (clinical screen) and to provide written informed consent. Figure 2.1 outlines the recruitment and participation process.
Figure 2.1: Flow chart of study participation

Telephone Interview Screening

- Detailed Screening at Royal Perth Hospital – Clinical Screen

- Baseline Assessment

- Randomisation

- Cognitive Activity Group

  - 5 Week Intervention

  - Follow-up Assessment

  - 6 Month Booster Telephone Calls

  - 12 Month Follow-up Assessment

  - Group Booster Session

  - 24 Month Follow-up Assessment

- Education Group

  - 5 Week Intervention

  - Follow-up Assessment

  - 6 Month Booster Telephone Calls

  - 12 Month Follow-up Assessment

  - Group Booster Session

  - 24 Month Follow-up Assessment
2.2.2.2 Inclusion and Exclusion Criteria

The most important defining feature of participants included in the PACE study was a diagnosis of MCI, which was ascertained at the screening assessment (detailed below). Individuals needed to be aged 65 years or over at their last birthday and be willing and able to travel to the WACHA for assessments and for the intervention. All were proficient in spoken and written English. Individuals with a clinically recorded diagnosis of dementia according to ICD-10 criteria for Research (62) or who were suffering notable cognitive impairment, as evidenced by a Mini Mental State Examination (MMSE; (242)) score of 23 or less out of 30, were excluded from the study. The MMSE provides a brief screen of a range of cognitive domains (e.g. orientation, language, memory, visuo-spatial skills), with higher scores indicating better cognition. Additional exclusion criteria included current psychiatric disorder (e.g. depressive episode) and hazardous or harmful alcohol consumption (based on the Australian Alcohol Guidelines endorsed by the National Health and Medical Research Council 2001). We also excluded individuals with a current medical condition that prevented participation in the study tasks (such as significant sensory impairment), who had an illness likely to reduce survival over a 12-month period (e.g. advanced cancer), or who reported a clinical history of stroke associated with permanent disability. Those individuals who demonstrated functional impairment (as measured by the Structured Assessment of Independent Living Skills (243)) were also excluded. Table 2.1 summarises the inclusion and exclusion criteria.
2.2.2.3  Telephone Interview and Clinical Screen

Volunteers were initially screened via a telephone interview that aimed to ascertain concerns about their memory (see Volume 1, Appendix C). Those indicating that they had received a diagnosis of dementia were immediately excluded. The remainder were then asked about their general health - both past and current concerns - as well as education and English literacy skills. Details regarding current alcohol consumption (i.e. daily frequency and number of standard drinks consumed) were also collected and all potential participants completed the Patient Health Questionnaire-9 item (PHQ-9, see below) and the Modified Telephone Interview for Cognitive Status (TICS-M, see below). Telephone interviews took approximately 10 to 30 minutes to complete depending on the extent of information needed to address inclusion and exclusion criteria. Those meeting provisional criteria for inclusion were invited to a face-to-face assessment at the WACHA to confirm that they fulfilled the study criteria.

Patient Health Questionnaire - Nine Item (PHQ-9)(244). The PHQ-9 is the depression module taken from the full PHQ (245), an instrument used to make criteria-based diagnoses of depressive and other mental disorders according to the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV, (1)). In this study it was used to initially exclude individuals with depression and then to monitor the presence of depressive symptoms at follow up. Scores range from zero to 27, with scores of 15 or greater indicative of clinically significant depression. Volunteers with a score of 15 or more on the PHQ-9 were excluded from further participation in the study.
The Modified Telephone Interview for Cognitive Status (TICS-M) (246). The TICS-M is a 21-item cognitive screening battery with possible scores ranging from zero to 50 (higher scores indicate better cognitive performance). It takes five to ten minutes to complete and has been used to recruit for clinical trials for MCI (247). In this study, individuals who obtained scores between 19 and 38 (inclusive) were considered as possible candidates with MCI and invited to complete the next phase of recruitment. Older adults with scores lower than 19 were excluded, with this score suggesting the presence of clinically significant cognitive impairment. Those individuals with scores above 38 were also excluded because their performance suggested relatively intact cognitive functioning (247).

Trained research assistants conducted the clinical screen, and all additional baseline assessments. An alternate research assistant reviewed scoring and discrepancies were addressed by the PhD candidate. Three-hundred and twenty-four older adults completed the face-to-face assessment to establish the diagnosis of MCI in accordance with that proposed by the MCI Working Group of the European Consortium on Alzheimer’s disease (248):

- Cognitive complaints and reports of decline from the individual
- Cognitive disorder as evidenced by clinical evaluation (impairment in memory and/or in another cognitive domain)
- Absence of major repercussions on daily life (the individual may however report difficulties concerning complex day to day activities)
- Absence of dementia
Cognitive disorder was established by identifying performances 1.5 standard deviations below the age and sex norms on any Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) cognitive task (249). The CERAD is composed of sub-tests assessing language, memory and praxis and is considered a valid and reliable measure of cognitive function, as well as MCI and AD (250). Embedded within this test battery is the MMSE. As indicated, scores lower than 24 on the MMSE are reliably associated with the diagnosis of dementia or other organic mental disorders. The present study also used the MMSE to exclude participants with more severe cognitive impairment than MCI.

In addition to the cognitive screen, participants were required to score less than 16 on the World Health Organisation’s Alcohol Use Disorders Identification Test (AUDIT). This self report questionnaire is considered a reliable screening tool sensitive to the detection of risky, hazardous or harmful drinking (251). There are 10 items and supplementary questions, with questions scored on a scale of zero to four. Scores of 16 or above suggest “high-risk” or “harmful level” of drinking behaviour.

A self-reported medical history questionnaire was also completed by the participants and details collected regarding their medication use. A screen of participants’ ability to manage complex activities of daily living was conducted using a modified version of the Structured Assessment of Independent Living Skills (SAILS (243)). Information regarding the participant’s motor skills (fine and gross), language abilities and capacity to carry out tasks similar to day-to-day activities were collected (e.g. money related skills, following a recipe, reading a calendar). A score of 150 represented a perfect score and those individuals with
scores of less than 141, suggestive of clinically significant difficulties carrying out instrumental activities of daily living, were excluded.
Table 2.1. Inclusion and exclusion criteria for PACE.

<table>
<thead>
<tr>
<th>Inclusion</th>
<th>Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Diagnosis of MCI</td>
<td>- MMSE score ≤ 23</td>
</tr>
<tr>
<td>- Aged 65 or older</td>
<td>- Current psychiatric disorder</td>
</tr>
<tr>
<td>- Willing and able to travel to the WACHA</td>
<td>- Current hazardous or harmful alcohol consumption</td>
</tr>
<tr>
<td>- Proficient in written and spoken English</td>
<td>- Medical condition preventing participation or associated with reduced survival</td>
</tr>
<tr>
<td></td>
<td>- History of stroke associated with permanent disability</td>
</tr>
<tr>
<td></td>
<td>- Functional impairment</td>
</tr>
</tbody>
</table>

The screening assessment at the WACHA took approximately 30 to 40 minutes to complete. Any pertinent clinically information was reported to the relevant treating general practitioner with the consent of the study participant. Of the 324 screened, 171 met criteria and 160 offered written informed consent to participate. Figure 2.2 Shows the flow of participants during the trial.
Figure 2.2. Profile of trial and attrition.

324 Individuals screened for eligibility
(Clinical Screen)

160 Participants Randomised
164 Excluded
114 Criteria not met
50 Declined to participate

80 Randomised to Cognitive Activity Group

80 Randomised to Education Group

77 Completed 10 week F/up
1 Declined
2 Ill Health

79 Completed 10 week F/up
1 Declined

77 Completed 52 Week F/up
1 Declined
2 Ill Health

77 Completed 52 Week F/up
1 Deceased
2 Ill Health

67 Completed 104 Week F/up
10 Declined
1 Deceased
2 Ill Health

60 Completed 104 Week F/up
13 Declined
3 Deceased
4 Ill Health
2.3 Data Collection and Outcome Measures

2.3.1 Baseline Assessment

Baseline assessments were completed within three months of inclusion in the study, approximately two weeks before the first intervention session and prior to randomisation. Baseline and post intervention assessments took between 60 to 90 minutes to complete (including the provision of short breaks), with a two-hour session allocated for the more detailed 12 and 24 month follow ups. The assessments comprised a series of tests and questionnaires, as described below.

2.3.1.2 Primary Outcome Measure

Cambridge Cognitive Screen (CAMCOG-R): This is the brief neuropsychological battery of the Cambridge Examination for Mental Disorders of the Elderly - Revised (CAMDEX-R) (252) that includes a range of objective cognitive tests. It provides sub-scale scores for a number of areas (orientation, language, memory, attention and concentration, praxis, calculations, executive abilities, visual perception) as well as a global score, out of 105, of cognitive functioning. Participants are asked questions, shown pictures, required to do drawings and, asked to solve puzzles. All items of the MMSE are also incorporated into the CAMCOG-R (there is no option for spelling of ‘world’ backwards). The broad range of cognitive abilities covered by this instrument, together with the relatively short time frame required for administration (approximately 30 minutes), make the CAMCOG-R a very useful measure.
Whilst primarily developed to assist in the diagnosis of dementia, the CAMCOG-R has been found to be sensitive to the detection of mild cognitive decline and to change over time (253, 254). Higher scores reflect stronger cognitive performances with cut-off values of 79-80/105 identified as yielding 92% sensitivity and 96% specificity for discriminating between normal and dementia profiles (252). The CAMCOG-R is also recognised as a stable and reliable instrument – test re-test reliability is 0.86 and inter-rater reliability 0.90 (252, 255).

2.3.1.3 Secondary Outcome Measures

California Verbal Learning Test-Second Edition (Standard and Alternate Forms) (CVLT-II) (256): This is a 16-item word list task that measures verbal learning and memory. More than 50 learning and memory variables can be calculated. It yields scores on immediate and delayed recall as well as recognition. Analysis can also be undertaken with respect to the number of intrusive and repetitive errors. Provision of standard and alternate forms minimises practice effects and this measure was used to monitor change in memory functions.

The CVLT-II begins with the evaluation of the examinee’s ability to recall a list (List A) of 16 words, belonging to four semantic categories, over five presentation trials. The four categories are furniture, vegetables, ways of travelling and animals. Words from the same category are not presented consecutively. A 16-word interference list (List B) is then read and this contains two semantic categories previously used (vegetables and animals) whilst introducing two new categories (musical instruments and parts of a house). Short delay
free recall and short delay cued recall trials of List A then follow. A twenty minute delay is included next, after which the participant is asked to recall all previously presented List A words (long delay free recall trial). A cued recall trial of this list is then administered followed by a yes/no recognition trial of List A. An optional forced-choice recognition trial is also included, although this was not administered as part of the PACE study.

The CVLT-II was chosen as a secondary outcome measure as it is sensitive to memory impairment, demonstrates strong correlations with other memory tests and because low scores on word list learning tasks are associated with progression to dementia (257, 258). Total immediate recall, short delay free recall and long delay free recall scores were analysed as these variables have been found to have some of the highest test-retest correlations (0.80 to 0.89 for the standard form; 0.70 to 0.79 for the alternate version) (256, 259, 260).

The Symbol Search sub-test from the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III) (261) yields a measure of perceptual processing speed. Participants are asked to review a booklet and using a pencil, indicate whether target symbols appear in a search group of symbols. There are 60 items consisting of paired groups of symbols and the individual has 120 seconds to complete as many items as possible. A raw score is obtained by subtracting incorrect from correct responses. Prior research has found that CA is associated with lower rates of decline on measures assessing processing ability such as perceptual speed and working memory (262), supporting the use of Symbol Search and Digit Span (see below) as additional secondary outcomes of interest. Test-retest stability is
reasonable (0.79 to 0.80 depending on the age group) and the inter-rater reliability has been reported as very high (260).

The Digit Span sub-test from the WAIS-III (261) comprises forward and backward span components assessing individuals’ auditory immediate attention and working memory and is a very commonly employed measure. Digits forward requires the examinee to repeat sequences of digits verbatim immediately after they are presented orally by the examiner. The test consists of eight pairs (i.e. two trials given at each span length) of random strings of digits that are presented at the rate of one digit per second. The strings range from two to nine digits in length and the task is discontinued after the examinee fails both trials, of any given span length. The task is administered similarly for the Digit Span backward component, albeit the examinee needs to recall the digits in the reverse order, there are seven trials and the span length starts from two items, with the longest trial consisting of eight digits. Digits backward requires greater mental manipulation and visualisation of numbers whereas Digits forward can be performed with simple rote recall. The two scores are combined to give an overall total score. The higher the score, the better the performance. Test-retest stability is noted to be 0.73 to 0.85 (depending on the age group) and, as with Symbol Search, the inter-rater reliability described as very high (260).

The Trail Making Test (TMT) (260) has two parts and measures complex visual scanning, motor speed and mental agility. In Part A the participant draws lines to connect consecutively numbered circles. Part B requires the participant to connect a sequence of numbered and lettered circles, alternating between the two sequences. Both parts require perceptual tracking of a sequence and speeded visuo-motor output, although Part B also
requires divided attention and is therefore considered the more complex and sensitive condition with respect to cognitive functioning. The tests are timed, with participants instructed to complete the sequencing as quickly as possible. Time, in terms of seconds, is recorded, with lower scores reflecting faster completion times. This is a very popular test with a diverse collection of normative data available (263). When normative data are used, age and education effects are usually considered (performance declines with age) and test-retest reliability also ranges with the population studied (260). Inter-rater reliability is sound (0.94 for Part A; 0.90 for Part B) (260). The TMT have also been found to be sensitive to cognitive decline and differentiation between normal, MCI and dementia populations (264) (265).

The Controlled Word Association Test (COWAT) [25]. This test is also referred to as a verbal fluency test, word fluency, phonemic fluency and letter fluency. It evaluates the spontaneous generation of words, beginning with a specified letter, in accordance with a set of pre-established rules. The most commonly used letters are ‘F’, ‘A’ and ‘S’, with these adopted in the current test battery. Participants are asked to say as many words as they can think of that begin with the given letter of the alphabet, excluding proper nouns, and the same word with a different suffix. A minute is given for each letter trial and the total correct is the sum of all three trials. Higher scores therefore reflect greater generativity and more superior performance. Educational level exerts a significant influence on performance and fluency declines with increasing age. Test-retest correlations are considered reasonable (0.70 and greater), confirming the utility of this measure for tracking change, and inter-rater reliability is excellent (>0.95) (260). The frontal structures of the
brain are implicated in performance with verbal fluency tasks considered an indicator of executive functioning (266).

**PHQ-9:** We used the PHQ-9 total score, as previously described, to monitor changes in mood throughout the trial.

In addition to the cognitive and mood measures, a series of questionnaires assessing lifestyle activities was used. These were adapted from previously published resources and incorporated in our trial. They included the:

**Leisure Activity and Frequency Questionnaire (LAQ)** (267): This seven-item questionnaire assesses the frequency of participation in a variety of mentally stimulating leisure activities. Participants were asked to rate how often they typically engaged in playing board or card games, reading activities (books, newspapers), played a musical instrument, completed crossword puzzles or sudoku, wrote (journal entries, letters, emails) and participated in group discussion. Rating choices were daily, several days per week, once weekly, monthly, occasionally or never. These ratings were then collapsed into two categories – frequently or rarely. Given the relationship identified between leisure activity and cognitive decline (262), the aforementioned questionnaire was chosen to identify the effects that the individual’s level of activity over the course of the study may have on their cognitive functioning.

Participants also rated their level of engagement in physical activity (Physical Activity Questionnaire – PAQ) (268). They were asked to indicate how much time they spent, over
a week, taking part in vigorous (“makes you puff and pant”) and non-vigorous activity. Based on the amount of physical activity engaged in during a week, participants were rated as being active (participating in greater than or equal to, two and a half hours a week) or inactive (less than two and a half hours of weekly activity). A relationship between physical activity and cognitive functioning has previously been identified (141, 164), and (as discussed in Chapter 1) being physically active also has implications for other aspects of health and well being. An additional questionnaire was also added to identify the nature and quality of the participants’ social relationships via the Social Network Satisfaction Questionnaire (SNSQ) (269). Participants were encouraged to rate aspects of their interaction with family and friends and how satisfied they were with the nature of their relationships. Higher scores reflected greater support and satisfaction. This was perceived as a relevant issue to address given that there is evidence to suggest that older adults, who are socially supported, appear less likely to experience cognitive decline (270).

The Memory Functioning Questionnaire (MFQ) (271): The MFQ is a 64-item questionnaire addressing self-perception of everyday memory functioning. Participants were asked to evaluate the frequency with which they forget certain things (e.g. faces, appointments, what they read) and how serious they perceived these difficulties to be. Perceptions of memory functioning relative to a previous time frame were also rated, together with strategies utilised to assist with memory (e.g. making lists, using an appointment book). This questionnaire was used at baseline and across follow-up assessments to determine the influence of the intervention on perceived level of memory ability. Higher scores reflect less concern regarding functioning. The MFQ is considered a reliable indicator of memory complaints (271).
Quality of Life in Alzheimer’s Disease (QoL-AD) (272): This is a 13-item questionnaire completed by the participant assessing their perception of their quality of life across a number of different domains. These include physical health, energy, mood, living situation, memory, family, marriage, friends, self, capacity to undertake activities, money and life in general. Ratings were made according to perceptions being ‘poor’, ‘fair’, ‘good’ or ‘excellent’. Total scores range from 13 to 52 and higher scores are indicative of greater perceived quality of life. Declines in quality of life are not uncommon in the MCI population and may be perceived as a potential target for intervention (273, 274). Internal reliability has been described as good (0.86) (275).

Participants were also asked to provide specific details regarding their educational (highest degree achieved and number of years of education) background.

The assessment battery described above was repeated immediately after the five-week intervention sessions had been completed (please see details below) and again after 12 and 24 months (please see Table 2.2). The 12 and 24-month follow-up assessments were undertaken relative to the baseline testing and also included the additional measures administered at the “Clinical Screen”.

2.3.1.4 Biological Sample and DNA Collection

Participants were invited to donate a blood or saliva sample to determine the influence of common biochemical (e.g., high plasma homocysteine) and genetic factors (e.g., apolipoprotein E4 genotype) on participants’ response to the intervention. These samples
were collected at the 12-month booster session, to be stored at -80°C and processed by the Department of Clinical Pathology and Biochemistry at the RPH. All material has been batched for future analysis. A trained hospital phlebotomist took the blood samples and saliva was collected using an Oragene DNA kit.
Table 2.2: Outline of the assessments and timelines of the PACE trial. The X indicates at which point of the trial the respective assessments took place. Follow-up times relate to baseline testing.

<table>
<thead>
<tr>
<th>Assessment Tool</th>
<th>Clinical Screen</th>
<th>Baseline</th>
<th>10 weeks</th>
<th>52 weeks</th>
<th>104 weeks</th>
<th>Outcome Measure</th>
<th>Measure/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9 (244)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Mood</td>
<td>Total Score (0-27)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↓Scores = ↑Mood</td>
</tr>
<tr>
<td>CERAD (249)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Global Cognition</td>
<td>Individual Subtest Scores</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>MMSE (242)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Global Cognition</td>
<td>Total Score (0-30)</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>AUDIT (251)</td>
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<td>Alcohol Use</td>
<td>Total Score (0-40)</td>
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<td></td>
<td></td>
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<td>↓Scores = ↓Consumption</td>
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<tr>
<td>SAILS (243)</td>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td>Functional Ability</td>
<td>Total Score (0-150)</td>
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<tr>
<td>MHQ (243)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Health Issues</td>
<td>Yes or No</td>
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<td>CAMCOG-R (255)</td>
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<td></td>
<td></td>
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<td>Global Cognition</td>
<td>Total Score (0-105)</td>
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<td></td>
<td></td>
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<td>↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>CVLT-II (256)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Memory</td>
<td>Recall Scores</td>
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<td>↑Scores = ↑ Performance</td>
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<tr>
<td>Digit Span (261)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Attention</td>
<td>Total Scores</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>Symbol Search (261)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Processing Speed</td>
<td>Total Score (0-60)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>Assessment Tool</td>
<td>Clinical Screen</td>
<td>Baseline</td>
<td>10 weeks</td>
<td>52 weeks</td>
<td>104 weeks</td>
<td>Outcome Measure</td>
<td>Measure/Comment</td>
</tr>
<tr>
<td>-----------------</td>
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<td>-----------------</td>
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</tr>
<tr>
<td>TMTA (260)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Attention/Proc. Speed</td>
<td>Total Time (seconds) ↓ Scores = ↑ Performance</td>
</tr>
<tr>
<td>TMTB (260)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Executive Functions</td>
<td>Total Time (seconds) ↓ Scores = ↑ Performance</td>
</tr>
<tr>
<td>COWAT (260)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Executive Functions</td>
<td>Total Score ↑ Scores = ↑ Performance</td>
</tr>
<tr>
<td>LAQ (184)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Leisure Activity</td>
<td>Rarely or Frequently</td>
</tr>
<tr>
<td>PAQ (268)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Physical Activity</td>
<td>Active (≥ 2.5 hrs) or Inactive (&lt;2.5 hrs)</td>
</tr>
<tr>
<td>SNSQ (269)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Social Activity</td>
<td>Total Score (7-21) ↑ Scores = ↑ Support</td>
</tr>
<tr>
<td>MFQ (271)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Perception of Memory</td>
<td>Total Scale Score ↑ Scores = ↓ Concern</td>
</tr>
<tr>
<td>QOL-AD (272)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Quality of Life</td>
<td>Total Score (13-52) ↑ Scores = ↑ Quality</td>
</tr>
</tbody>
</table>

A booster telephone call took place at 24 weeks, with a face to face booster at 52 weeks.

↓ = Lower; ↑ = Higher; PHQ-9 = Patient Health Questionnaire-Nine Item; CERAD = Consortium to Establish a Registry for Alzheimer’s Disease; MMSE = Mini Mental State Examination; AUDIT = Alcohol Use Disorders Identification Test; SAILS = Structured Assessment of Independent Living Skills; MHQ = Medical Health Questionnaire; CAMCOG = Cambridge Cognitive Examination; CVLT-II = California Verbal Learning Test- Second Edition; TMTA = Trail Making Test Part A; TMTB = Trail Making Test Part B; COWAT = Controlled Oral Word Association Test; LAQ = Leisure Activity Questionnaire; PAQ = Physical Activity Questionnaire; SNSQ = Social Network Satisfaction Questionnaire; MFQ = Memory Functioning Questionnaire; QOL-AD = Quality of Life in Alzheimer’s Disease.
2.4 Intervention

2.4.1 Introduction

The interventions (both CA strategy training and control education) consisted of a five-week group activity run by the PhD candidate who is a qualified Neuropsychologist at the WACHA. The CA strategy training and control education groups were exposed to the same length of intervention, social interaction and contact with the program coordinator. Both the CA and educational intervention were manualised (see Volume 2, Appendices A and D) and delivered in a structured way, and all sessions (220) were audio-taped for subsequent fidelity assessment (as detailed in Chapter 3). Forty-four of these sessions were randomly selected and transcribed. An independent-rater (a WACHA research assistant) used a scale to evaluate session content for consistency of concepts and issues raised across sessions according to a pre-defined criteria (content not presented, content partly presented, content presented in full).

As indicated, research assistants (RAs) trained by the PhD candidate, blinded to group allocation conducted all assessments. RAs were provided with strict instructions to avoid any potential opportunity for disclosure regarding intervention participation. A summary of each intervention is provided below. If participants missed a session, they were subsequently given the material covered and encouraged to approach the facilitator with any questions or concerns.
2.4.2 Cognitive Activity (CA) Strategy Training Group

Each group consisted of 6-9 participants who took part in 90-minute sessions twice a week for five weeks (10 sessions in total). Each session was divided into two halves with an approximate 10 to 15 minute tea break and one session was run in the morning during the week, with the second session in the afternoon. Participants were provided with light refreshments during the break, as well as having opportunity to socialise with each other.

At the first session, each participant was provided with a manual (as per Volume 2, Appendix B) and they were subsequently given handouts at the beginning of each session that detailed all of the information presented during the session. The focus of Session One was to introduce the nature of the program and develop familiarity within the group, with personal introductions and sharing of background information/experiences. Participants had opportunity to discuss any concerns and their expectations regarding the program and their involvement in the study.

Sessions Two and Three focussed on the cognitive domains of attention, processing speed and executive functions, how these domains change as people age, and the influence they have on memory abilities. Examples of these capacities in everyday situations were provided and participants were advised about strategies to manage cognitive decline associated with these domains, including a number of practical exercises. Review and opportunity for discussion of session content was encouraged and participants were also allowed to assist each other, if there were aspects of the written activities they were having difficulty with.
Memory was the primary focus of Sessions Four to Seven, with the aim of defining the processes involved in learning and retaining new information. Time was spent outlining the various components of memory, with examples given of the different types of processing requirements necessary to remember novel material and situations. Again, a practical emphasis on memory functioning was utilised and sessions provided participants with strategies and techniques to manage memory dysfunction. There was regular opportunity for supervised practice of such techniques in all sessions and participants were encouraged to discuss the types of strategies they were implementing in their own environments and to share this knowledge with other members of their group.

Session Eight reviewed age associated language changes and aimed to provide participants with ways to manage word finding difficulties, as well as affording opportunity for undertaking language-based exercise activities. A significant amount of the session was devoted to the activities, as well as, discussion within the group as to how each individual managed situations in which they experienced difficulty in conversation.

The final two sessions (Nine and Ten) were used to practice and review the previously presented material and recommended strategies, and to discuss any difficulties managing the strategies/techniques previously presented. This included covering all of the topics presented in Sessions Two through to Eight and encouraging discussion regarding the entirety of the program. During the final session, participants were also invited to provide written feedback (as per an anonymous questionnaire) regarding their impression of the intervention and perceived benefits of such (see Volume 1, Appendix D).
2.4.3 Education Group

The format of the sessions for those participants randomised to the Education group was the same as that for the CA group. Each educational group also consisted of 6 to 9 participants who took part in 90-minute sessions twice a week for five weeks (10 sessions in total). Participants were also provided with a manual (as per Volume 2, Appendix E) and given the content material for each session, at its commencement.

As with the CA group, Session One was primarily devoted to individual introductions, as well as, being provided with information regarding the session content for the entire program. Session Two covered the topic of memory functioning and dementia, aiming to provide a broad overview of how these issues can affect older people. A considerable part of this session was devoted to understanding the concept of dementia, definitions and diagnoses and the implications for diagnoses with respect to daily functioning. Participants watched a video presentation and were provided with a fact sheet devised by the Alzheimer’s Association.

Session Three reviewed the health benefits associated with physical activity and ways to incorporate physical activity into daily lifestyle. Video presentations regarding physical changes in ageing, as well as the benefits of a healthy diet were shown. Barriers to physical activity and good eating habits were discussed, as well as the implications for inactivity and poor diet. Handouts regarding falls, recommended physical activity for older adults and nutritional information were provided.
Sessions Four and Five were devoted to defining stress and depression as well as reviewing the cause, effects and management of these conditions. Participants were encouraged to discuss their understandings of this terminology, personal experiences and the types of lifestyle and health issues that can influence the development of psychological issues in the elderly. A video presentation regarding the signs of symptoms of depression was shown and participants were provided with handouts endorsed by Beyond Blue.

Sleep and sleep disturbance in older adulthood was the focus of Session Six. Participants learnt about the different stages of sleep and how these can change as we age. Recognising the differences between acute and more chronic sleep problems were discussed as well as the implications that poor sleep can have for well being and daily functioning. A handout addressing sleep hygiene and management of sleep disturbance was provided and participants were encouraged to talk about the different strategies they might personally implement if sleep was compromised.

In sessions Seven to Nine, focus was placed on issues of retirement including expectations, lifestyle changes, volunteer activities, cultural/societal implications of ageing and travelling. There was a considerable amount of group discussion across these sessions, with individual participants provided with opportunity to talk about some of the challenges they faced when they retired, the benefits gained from participating in volunteer activities and safety issues associated with changes in functioning and well being. Handouts regarding information on volunteering and managing safety risks in the home environment were provided.
Session Ten reviewed the content of material covered in the previous weeks and allowed opportunity for discussion of any questions/issues arising from the presented topics. Participants were also invited to provide written feedback (as per an anonymous questionnaire) regarding their impression of the intervention and perceived benefits of such (see Volume 1, Appendix D). In contrast to the CA group, there was no emphasis on skill development or the promotion of mentally stimulating goal directed activities. Sessions were generally spent watching videos or discussion regarding personal experiences relating to the topic at hand. Opportunities for social interaction were considered equal across the two intervention groups.

2.4.4 Booster Sessions

All participants received a fifteen-minute “booster” telephone call six months after the baseline assessment to review and discuss the topics presented at the group sessions they had previously taken part in. The telephone call was conducted as part of a structured interview, with each participant in their respective groups asked a similar set of questions regarding their current level of functioning and review of the knowledge gained at the time the group sessions was undertaken (see Volume 2, Appendices F and G).

In addition to their telephone interview, the CA group were also sent a set of written exercise activities (as per Volume 2, Appendix F), similar to those completed during their time in the program, which they were asked to complete in anticipation for their booster call. The time necessary for completing the written exercise activities was about thirty minutes.
Following their 12-month assessment, participants were invited to attend a new face-to-face booster session (both for control and intervention participants, see Volume 2, Appendices H and I). This was conducted at the study centre and they met face-to-face with other individuals from their group, or those involved in the same intervention. The same facilitator provided a 1-hour review of topics previously covered in the five-week program. This session was run in the mornings, with a light breakfast provided.
2.5 Statistical Methods and Ethical Approval

2.5.1 Randomisation, Sample Size and Power Calculation

After the baseline assessment, participants were randomly allocated to either the CA or control education interventions according to a random list of numbers generated by computer. Randomisation was undertaken in random blocks of 12 to 18, with six to nine individuals allocated to each group. The allocation list was handled by an independent investigator who had no contact with study participants and was not involved in the supervision of staff responsible for the collection of data. The allocation table was then passed on to the investigator running the intervention (author), who invited eligible participants to join the relevant groups. Research assistants undertaking the follow-up assessments remained blinded to group allocation. Steps taken to ensure blinding included strict instruction given to participants at the beginning of their assessments and ensuring that testing was conducted on days alternate to when the programs were run to minimise opportunity for interaction between research assistants and participants.

At the time of conceptualisation of the trial, there was no reliable data for calculating the sample size. Available data suggested that cognitively healthy older people living in the community lose 1.6 points per year on the CAMCOG [30]. Factoring in a possible 20% loss to follow up, with 64 people in each group it was anticipated that the study would have 80% power to detect a between-groups difference of 1.5 points on the CAMCOG-R. This assumes a decline that is twice as large in the educational compared with the cognitive intervention group, and although statistically this may be associated with moderate effect size (0.5), it is the minimum difference that one would consider clinically significant.
2.5.2 Statistical Analyses

The data were analysed using Stata Version 12 (StataCorp LP). For normally distributed continuous variables, arithmetic means and standard deviations (SDs) were calculated. Baseline comparisons between the CA strategy training group and Education group for normally distributed variables were conducted using \( t \) tests, with categorical data analysed using the Pearson method and the statistical result being distributed as \( \chi^2 \). The significance level was set at \( p<0.05 \). The three follow-up time points were conducted at 10 weeks, 52 weeks and 104 weeks. The primary analysis was based on an intention to treat analysis utilising generalised linear mixed models due to the use of repeated measures, with each person treated as a random effect. The analysis was then repeated excluding the data from those individuals (non-completers) who attended six or less of the ten program sessions and for those whom complete data sets were not available.

Post hoc analyses investigated the impact of gender and MCI status on cognitive function in relation to the intervention.

Whilst accepting that participation in the cognitively non-specific educational intervention may have an effect on the performance of participants, in order to ensure continued participation of the control group it seemed crucial to provide some form of intervention or potentially face differential drop out, with the control group participants withdrawing because of lack of engagement in the study. Changes over time were modelled for both groups to determine the effect of the interventions (as well as the sustainability of this effect over 24 months) on cognitive performance.
2.5.3 Ethical Approval

Participants were provided with an information sheet that explained the purpose of the study and the expected benefits to participants. Participants were aware that they could withdraw from the study at any time without prejudice and were consented to participate in the trial when presenting for their Clinical Screen, and prior to undertaking baseline assessments. Further written informed consent was obtained at the time of the 12 month follow-up when participants were invited to remain in the study for a further 12 months and with respect to providing a biological sample. Participants were consented by either the PhD candidate or a research assistant.

All analyses were performed on de-identified datasets. Ethical approval for the study was obtained from the Human Research Ethics Committee of the University of Western Australia and the Human Research Ethics Committee of Royal Perth Hospital. Research protocols complied with the Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects. All files were de-identified and stored in a locked filing cabinet. Copies of the Information Sheet and Consent Form as well as of the letters of approval from the relevant Ethics Committees appear in Volume 1, Appendix B.
CHAPTER 3

TREATMENT FIDELITY AND ACCEPTABILITY
CHAPTER 3: TREATMENT FIDELITY AND ACCEPTABILITY

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3.1 Abstract

Acceptability and fidelity assessments are an integral part of research, although few published trials comment on these processes in detail. We designed a randomised controlled trial (RCT) to identify the benefits of a cognition-focused intervention for older adults with mild cognitive impairment (MCI). Participants completed a six-item feedback questionnaire identifying level of satisfaction with their allocated intervention; this formed the acceptability assessment. Audio recordings of all sessions were reviewed and systematically assessed and rated for consistency of delivery (fidelity assessment).

Mean attendance (SD) was 8.1 sessions (2.8) for the Cognitive Activity (CA) group and 8.4 (2.6) for the control Education group. There were no differences between groups regarding clarity and interest, willingness to attend the program in the community and pay a fee. Both groups reported the interventions to be relevant to their needs; however this was rated more highly by the CA group (p<0.01). There was high adherence to delivery of program content across both groups, yielding consistency scores above 95%.

This study illustrates a systematic approach to assess acceptability and fidelity. The results show that the intervention was well received and met the needs of all participants. The manualized structure of the sessions facilitated the systematic implementation and reproducibility of the interventions. Acceptability and fidelity assessments have implications for the validity of assumptions made regarding trial outcomes and should therefore be included as standard process in RCTs.
3.2 Introduction

Identifying how well a behavioural intervention is received by the intended target population and the degree to which it adheres to a set protocol can have significant implications for translation of the program into clinical practice and to determine the validity of the findings. These two processes, commonly labelled “acceptability” and “treatment fidelity”, should routinely be adopted as due process in the early stages of planning in health behaviour interventions and programs.

The acceptability of an intervention can be influenced by several factors, including the specific nature of the treatment (e.g. opportunity for personal gain), the complexity of the intervention, and the format of the delivery of the specific treatment (276). Subjective evaluation measures, such as the use of self-report questionnaires, are frequently adopted to identify consumer ratings regarding the appropriateness, effectiveness and fairness of the intervention, which are characteristics that exemplify acceptability (277). Consumer satisfaction plays a particularly important role in determining whether the intervention or treatment procedures are likely to be adopted, implemented and maintained, beyond the setting in which it was delivered.

Treatment fidelity can be defined as the methodological strategies and practices used to address the reliability and validity of research interventions (278). It aims to determine if the treatment was delivered as intended and the extent to which newly learnt skills are applied to daily life (279). Treatment fidelity becomes important when determining the degree to which the effectiveness (or lack thereof) of an intervention may have been
influenced by other factors, and has implications for the degree of confidence placed upon proposed mechanisms for observed change (279). This becomes a particularly salient issue for interventions delivered by different instructors across varied time points within a trial.

Despite the potential implications for the interpretation of study outcomes, the reporting of acceptability and treatment fidelity has not been consistent (278). For example Dane and Schneider reviewed the degree to which consideration was given to fidelity assessments in a series of primary and early secondary prevention programs (280). They established a set of criteria against which studies were assessed, focusing specifically on aspects of program integrity, rating fidelity according to adherence, exposure, quality of delivery, participant responsiveness and program differentiation (280). They found that less than a third of the 162 outcome studies addressed the issue of fidelity (280).

The Promoting Healthy Ageing with Cognitive Exercise (PACE) study was designed to determine whether a cognitive activity intervention could decrease the rate of cognitive decline amongst older adults with mild cognitive impairment (MCI). The aim of identifying the acceptability of the program was to investigate consumer satisfaction with the interventions and to determine how the target population rated the program components. They were also asked to rate the relevance of the program to their perceived needs and whether the intervention was something in which they would be willing to participate in their community.
The aim of the fidelity assessment was to ensure consistency in delivery of the content of the intervention. In accordance with the criteria utilized by Dane and Schneider (1998), attention was also paid to exposure, participant responsiveness and program differentiation.
3.3 Methods

3.3.1 Participants, Randomization and Blinding

Detailed information regarding the participants, the training program, the experimental design and the outcome measures of the PACE study has been published elsewhere (281). In brief, 160 adults were deemed eligible to participate in the trial, based on the following inclusion criteria, – a diagnosis of MCI (according to (80) criteria), aged 65 years or over, able to travel to the research centre and proficient in spoken and written English. Individuals with a diagnosis of dementia according to ICD-10 criteria for research (282) or suffering notable cognitive impairment, as evidenced by a Mini Mental State Examination (MMSE;(283)) score of 23 or less, were excluded from the study. Additional exclusion criteria included current psychiatric disorder, current hazardous or harmful alcohol consumption (based on (251)), and current medical condition that prevented participation in the study tasks (such as sensory impairment) or was associated with reduced survival over a 12 month period (e.g. advanced cancer). Individuals who reported a clinical history of stroke associated with permanent disability were also excluded. A baseline neuropsychological assessment was conducted prior to randomization into either a five-week Cognitive Activity (CA) strategy training program or a control Education program. Randomisation was undertaken in blocks of 12 to 18, according to a random list of numbers generated by computer, with six to nine individuals allocated to each group. Due to the nature of the intervention, participants were not blinded to group membership; however research assistants undertaking the follow-up assessments were. All assessments and the program interventions were undertaken at the Western Australia Centre for Health and Ageing (WACHA) at Royal Perth Hospital (RPH).
This project was conducted in accordance with the Helsinki Declaration for Human Rights. The Ethics Committee of the Royal Perth Hospital approved the study protocol and all participants offered written informed consent.

### 3.3.2 Intervention

During the early stages of conceptualization of the trial, eight individuals with MCI, aged 60 years and over, were invited to participate in a one-hour focus group. Their opinions were sought regarding the development of a program of CA specifically designed for older adults concerned about cognitive decline. The consistent opinion of the group was that any CA program needed to be challenging and personally stimulating and to have a social component. Two program interventions were then manualised comprising the CA and Education arms. The content of the manuals incorporated known information regarding age-associated cognitive decline and strategies to manage difficulties, as well as, addressing health issues relevant to older adult populations. These programs were piloted with a group of 10 older adults with MCI and served as the basis for the design and implementation of the intervention, which is described below.

Study participants were asked to attend ten 90-minute sessions over a five-week period. The group randomly assigned to CA received information about age-associated cognitive changes and ways to manage common difficulties, as well as completing pencil and paper activities to illustrate strategies for enhancing attentional capacity, memory functions and executive processes. Details about the intervention have been described elsewhere (281). In contrast, participants randomly assigned to the Education program took part in a series of
presentations about healthy ageing, including the impact of lifestyle factors, with sessions comprising videos and group discussion (please see (281) for further details). A Clinical Neuropsychologist (MV) ran all groups, exposing participants to the same instructor, time with instructor and social contact. All participants received a manual that contained each session content and material covered for each session. Six months after the beginning of the intervention, participants received a “booster” telephone call that consisted of a summation of their program material and addressed any doubts or concerns. A further face-to-face booster group session, one hour in duration, was conducted one month after the 52-week follow up assessment. All booster sessions were conducted by the same Clinical Neuropsychologist who had run the group interventions (MV). Finally, all participants underwent the same assessment protocol, regardless of group assignment (please see (281) for details).

3.3.3 Study Measures

Study participants who attended the final session of their five-week group program were asked to complete a brief questionnaire (see Box 3.1), rating the acceptability of the program. These questionnaires were completed anonymously within the group environment whilst the instructor was out of the room and the data were collated and entered into an excel spreadsheet by an independent research assistant.
Box 3.1. Feedback questionnaire completed by participants at the conclusion of their treatment intervention program.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Please indicate how relevant you found this program to your needs</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>(1= very irrelevant and 5 = very relevant)</td>
<td></td>
</tr>
<tr>
<td>2. If you had the opportunity to attend this program in your own area would you attend?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>If “NO” please explain why not.</td>
<td></td>
</tr>
<tr>
<td>If “YES” would you be willing to pay a fee for his service: Yes or No</td>
<td></td>
</tr>
<tr>
<td>3. Do you expect to make any changes to your life as a result of this program?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>If “YES” please explain</td>
<td></td>
</tr>
<tr>
<td>4. Are there other topics you think should be covered in this program?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>If “YES” what are they?</td>
<td></td>
</tr>
<tr>
<td>5. Please rate the overall program presentation (1 = strongly disagree and 5 = strongly agree)</td>
<td>Clear 1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>Relevant 1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>Interesting 1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>Informative 1 2 3 4 5</td>
</tr>
<tr>
<td>6. Please provide any further comments/recommendations about the program.</td>
<td></td>
</tr>
</tbody>
</table>
Eleven Education and 11 CA strategy training groups were conducted over the course of the study resulting in a total of 110 presentations under each condition. The content of each session was digitally recorded and following each session, the voice recordings were downloaded onto a PC. An excel spreadsheet was used to identify a random list of session (e.g. 2-9) and group (e.g. 1-11) numbers, excluding sessions one and 10, generated by computer. Session one was excluded as it was considered an introductory session which reviewed the nature of the trial and, program material to be covered, and allowed for participants to informally get to know each other. As session 10 was used as a revision session and no new material was presented, it was also excluded. An Excel spreadsheet was used to identify a random list of numbers generated by computer, with a total of 44 sessions (i.e. 22 from each arm) randomly selected and transcribed by research assistants.

A template was devised that identified the individual content components of each session, against which ratings were later made to determine whether material contained in the instructor program manual had been presented. The amount of content and topic structure to be reviewed varied across each session. Topics which were rated and the amount of item content within each topic are shown in Table 3.1. A rating key was devised to indicate the degree to which the topic was covered and numerical ratings were applied.

A research assistant, who was not involved in the transcribing process and did not have any contact with participants, listened to the transcripts and completed the independent ratings. Once the initial ratings of session content had been completed, the rating scale was further collapsed and new values assigned to assist in analysis. “Not Covered” and
“Uncertain/Unclear” were assigned a value of “0”, “Partially Covered” was scored as “1” and “Covered” was scored as “2”, as outlined in Table 3.2.
Table 3.1. Content of session topics rated for fidelity assessment.

<table>
<thead>
<tr>
<th>Session Number</th>
<th>Cognitive Activity Group</th>
<th>Education Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Topic Introduced/Program Outline</td>
<td>No. items Rated</td>
</tr>
<tr>
<td>2</td>
<td>Welcome/Introduction of Session</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Warm up exercise</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Introduce session topic on “Cognition”</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Introduce “attention” as cognitive construct and focus of session</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Review strategies for improving attention</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Introduce “processing speed” as cognitive construct</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Strategies for coping with reduced processing speed</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Summarize and review new concepts</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Exercise Activity</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Closing Summation</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Brief review of previous session topic</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduce cognitive construct of “executive functions”</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Exercise activities</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Examples of strategies for use in the home</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Constructing manuals/notebooks</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Discuss non-cognitive factors that can influence memory</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Summarize and review new concepts</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Summarize and review new concepts</td>
<td>3</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session Number</td>
<td>Topic Introduced/Program Outline</td>
<td>No. items Rated</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>Cognitive Activity Group</td>
<td>No. items Rated</td>
</tr>
<tr>
<td>4</td>
<td>Introduction/welcome group</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Brief review of previous session topics</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Examples of myths about memory</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Introduce topic on how memory works</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Working Memory/Short Term Memory</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Long Term Memory (LTM)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Introduce terms: encode, storage, retrieval</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Encoding</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Attention</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Association</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Analysis and elaboration</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Storing information into LTM</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Retrieval</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Closing comments</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Brief review of previous session topic</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduce new topic</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Address other possible causes of memory difficulties</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Maintaining a positive attitude about memory</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Reviewing the basics of memory processes</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Discussion regarding depth of processing</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Closing comments</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Session Number</td>
<td>Cognitive Activity Group</td>
<td>Education Group</td>
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<tr>
<td>----------------</td>
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<tr>
<td></td>
<td>Topic Introduced/Program Outline</td>
<td>No. items Rated</td>
</tr>
<tr>
<td>6</td>
<td>Brief review of previous session topic</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduce new topic</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Using strategies in everyday settings</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Review importance of selective attention</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Memory strategies to be incorporated in the home and daily routine</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Take home messages</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Closing comments</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Introduce session outline</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Review home strategy suggestions/group discussion</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Review previously learnt word pairs</td>
<td>2</td>
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<tr>
<td></td>
<td>Review of attention, processing speed, executive functions</td>
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<tr>
<td></td>
<td>Tea Break</td>
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</tr>
<tr>
<td></td>
<td>Exercise activity</td>
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<tr>
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<td>Session Number</td>
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<td>Education Group</td>
</tr>
<tr>
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<td>-----------------</td>
</tr>
<tr>
<td>8</td>
<td>Topic Introduced/Program Outline</td>
<td>No. items Rated</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Ageing and language skills</td>
<td>6</td>
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<tr>
<td></td>
<td>Definition of semantic memory</td>
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<tr>
<td></td>
<td>Review of strategies for word finding difficulties</td>
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<tr>
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<td>Exercise activity</td>
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<tr>
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<td>Exercise activity</td>
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<tr>
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<td>Introduce session outline</td>
<td>1</td>
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<tr>
<td></td>
<td>Discussion of strategies for keeping mentally fit</td>
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</tr>
<tr>
<td></td>
<td>Review memory strategies</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Tea Break</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
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<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
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<tr>
<td></td>
<td>Exercise activity</td>
<td>5</td>
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<tr>
<td></td>
<td>Closing comments</td>
<td>2</td>
</tr>
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<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.2. Rating scale used in template.

<table>
<thead>
<tr>
<th>Content Coverage</th>
<th>Explanation</th>
<th>Numerical Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not covered</td>
<td>There was no mention of the topic/subject matter.</td>
<td>0</td>
</tr>
<tr>
<td>Uncertain/Unclear</td>
<td>Unclear if topic discussed either because there was only vague reference or the recorded information was distorted/unable to be interpreted.</td>
<td>0</td>
</tr>
<tr>
<td>Partially Covered</td>
<td>Reference was made to the topic, but only in minimal detail before the next topic was introduced. There were no detailed explanations or examples provided.</td>
<td>1</td>
</tr>
<tr>
<td>Covered</td>
<td>Information was presented that directly addressed the topic.</td>
<td>2</td>
</tr>
</tbody>
</table>

Exposure was maintained for each of the 11 groups in the respective CA and Education arms, by adhering to a strict 90-minute time limit for each session and ensuring that the same instructor consistently delivered all 10 sessions, within each intervention, across the course of the trial. Attendance at each session was manually recorded in order to monitor levels of participation across both groups. A minimum of seven sessions was set a priori for participants to be considered as having completed the program.

Program differentiation was maintained by ensuring that there was no potential for overlap between groups, with participant sessions separated by a two-hour time frame. If a husband and wife wished to participate in the program and both met criteria, they were asked to self-select the individual who would take part in the trial. Participants were explicitly asked at each assessment not to discuss information regarding the intervention with research staff and, similarly, staff conducting assessments were instructed not to discuss with participants any aspects of the intervention.
3.3.4 Statistical Analyses

Data were managed in Excel and analyzed with Stata version 11.0 (StataCorp, College Station, TX). We used descriptive statistics (mean, standard deviation of the mean [SD], proportions) to summarize our data, and Pearson’s chi-square statistic to test the frequency distribution of ratings. We calculated a fidelity score for each session by adding the ascribed ratings and dividing them by the maximum possible rating. For example, if there were forty content items, a maximum possible score would be 80/80, with the forty items having attracted a rating of “two” if they had been entirely covered. These values were converted to percentages for each session (e.g. 80/80 = 100%). An overall fidelity rating was later calculated by summing the percentages and determining the mean score for the 22 sessions randomly chosen to be rated. We established, a priori, that an overall fidelity rating of 90% or more indicated acceptable fidelity. Alpha was set at 5% and all tests reported are two-tailed.
3.4 Results

Of 160 participants, 80 were randomly assigned to the CA group. Participants in the CA and Education group did not differ in age, education or cultural background (p>0.05; data not shown), though there were significantly more women in the CA group (p<0.05; data not shown).

Seventy-four feedback forms were collected from the CA group and 68 from the Education group (out of a possible 80 participants in each group, respectively). The proportion of responses to questions one to five is presented in Table 3. The only significant difference between the two groups was the observation that the CA group reported the intervention to be significantly more relevant to their needs ($\chi^2=24.5$, degrees of freedom df=5, p<0.01), as expected. Each program was rated equally highly with respect to clarity, interest and how informative the content was and over 85% of participants from both groups surveyed indicated that they would attend this sort of program in their local area. More than two-thirds would be willing to pay a fee to receive the service, with no significant differences between the groups (Table 3.3).

An overall fidelity score was calculated for each group’s presentations, with these being 96.1% (SD 2.39; 95% CI 95.10, 97.10) and 94.7% (SD 4.40; 95% CI 92.87, 96.55) for the CA and Education group, respectively. There was no significant difference in the number of sessions attended between groups, with mean attendance for the CA group being 8.1 sessions (SD = 2.8, range 0-10), with 82.5% of the participants attending seven or more.
Mean attendance for those randomized to the Education group was 8.4 sessions (SD 2.6, range 0-10), with 87.5% attending seven or more.
Table 3.3 Percentage ratings for feedback questionnaires post program completion.

<table>
<thead>
<tr>
<th>Rating Scale</th>
<th>CA Group (N=74) Percent Response</th>
<th>Education Group (N=68) Percent Response</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1 Program Relevant</td>
<td>Q1 Program Relevant</td>
<td></td>
</tr>
<tr>
<td>Very Irrelevant</td>
<td>1.4</td>
<td>13.2</td>
<td>0.000</td>
</tr>
<tr>
<td>Irrelevant</td>
<td>2.7</td>
<td>1.5</td>
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</tr>
<tr>
<td>Neutral</td>
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<td>23.5</td>
<td></td>
</tr>
<tr>
<td>Relevant</td>
<td>23.0</td>
<td>27.9</td>
<td></td>
</tr>
<tr>
<td>Very Relevant</td>
<td>62.2</td>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>4.1</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q2 Attend Locally</td>
<td>Q2 Attend Locally</td>
<td>0.225</td>
</tr>
<tr>
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<td>95.9</td>
<td>88.2</td>
<td></td>
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<tr>
<td>No Attend Locally</td>
<td>4.1</td>
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<tr>
<td>No Response</td>
<td>0.0</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q2 Pay Fee</td>
<td>Q2 Pay Fee</td>
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</tr>
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<td>67.6</td>
<td></td>
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<td>20.3</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>8.1</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q3 Changes</td>
<td>Q3 Changes</td>
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<td>Yes Expect to Make</td>
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</tr>
<tr>
<td>Changes</td>
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<td>No Expect to Make</td>
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</tr>
<tr>
<td>Changes</td>
<td>14.9</td>
<td>26.5</td>
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<tr>
<td>No Response</td>
<td>2.7</td>
<td>5.9</td>
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<tr>
<td></td>
<td>Q4 Other Topics</td>
<td>Q4 Other Topics</td>
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<td>36.8</td>
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<td>No Other Topics</td>
<td>54.1</td>
<td>47.1</td>
<td></td>
</tr>
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<td>No Response</td>
<td>24.3</td>
<td>16.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q5a Clear</td>
<td>Q5a Clear</td>
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</tr>
<tr>
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<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0.0</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Neither Agree nor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>1.4</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>16.2</td>
<td>14.7</td>
<td></td>
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<tr>
<td>Strongly Agree</td>
<td>64.9</td>
<td>66.2</td>
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<td>14.9</td>
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<td>Neither Agree nor</td>
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<tr>
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<td>Rating Scale</td>
<td>CA Group (N=74)</td>
<td>Education Group (N=68)</td>
<td>p value</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Percent Response</td>
<td>Percent Response</td>
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<td>Q5c Interesting</td>
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<td></td>
<td></td>
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<tr>
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<td>1.4</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>20.3</td>
<td>23.5</td>
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<tr>
<td>Strongly Agree</td>
<td>63.5</td>
<td>57.4</td>
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<td>13.2</td>
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<td>Q5d Informative</td>
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<td>Neither Agree nor Disagree</td>
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<td>0.0</td>
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<td>Agree</td>
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<td>20.6</td>
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<td></td>
</tr>
<tr>
<td>No Response</td>
<td>6.8</td>
<td>11.8</td>
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3.5 Discussion

The PACE trial was designed to identify the effect of a five week CA intervention on cognitive decline for older adults with MCI, although it was critical to the interpretation of the main results of the study that appropriate acceptability and fidelity are established. We found that there was no difference in attendance between the CA and Education groups, the ratings of content material, and willingness to participate in such a program within a community setting. The only difference was that older people in the CA group rated the program to be significantly more relevant to their needs, as expected.

Assessment of treatment fidelity and, more specifically, delivery of the intervention, revealed a high level of consistency, confirming that the intervention programs were delivered as intended, with no apparent bias with respect to the quality of the presentations. In addition, participant attendance was generally high, which provides a further indication of satisfaction with the program content and delivery.

Manualising the program interventions was certainly critical to ensure reproducibility of the intervention, which should now be tested in different settings and populations. This process, together with the recording of sessions ensured consistency in delivery, and assisted in minimizing issues of contamination. Further, contamination was also avoided by adopting a lengthy time interval between groups so that participants from the differing conditions did not come into contact with each other. Resource materials were also securely stored so as to reduce opportunity for accidental exposure.
With respect to identifiable limitations, participants were motivated volunteers with a vested interest in improving their cognition. It remains unclear as to whether the acceptability of the intervention would be as high in a general community setting. Further, the adopted measure of acceptability was possibly limited in scope, given the brevity and specific nature of the questionnaire. The degree to which these forms of programs are readily adopted by participants and practically applied will only be determined once we are able to establish efficacy and the interventions implemented in clinical practice. With respect to the fidelity assessment, the number of sessions randomly chosen to be reviewed was relatively small. This in part reflected the time and costs involved in transcribing the extensive number of sessions which were run with each of the groups. More precise estimates of fidelity would require extension of the study activities. Finally, measures of fidelity were limited to the number of content units delivered by the two interventions. It is unclear if good fidelity translates into greater benefits for patients and we are currently in the process of evaluating the results of the trial.

Assessing a research trial’s acceptability and fidelity allows investigators and independent reviewers to draw more accurate conclusions regarding the merits of any observed outcomes. Ideally, these assessments should be reported in publications of intervention trials. The consequences associated with treatment fidelity may potentially be minimized if the intervention is designed by the therapist intended to deliver it. However, the delivery of the intervention by the same individual becomes crucial, particularly if procedures aren’t in place to manage situations whereby an alternate party is required to deliver the program. Additionally, and in large recruitment pools, by utilising a manualised script and recording
sessions, consistency in delivery can be ensured. The type of questionnaire/measure utilized in the PACE trial can readily be adapted for all intervention programs to ensure integrity, regardless of whether the format is group or individualized, computer versus pencil and paper etc. The criteria proposed by Dane and Schneider have relevance for all forms of intervention delivery – computer based training or otherwise and future standardization on the minimum details to be reported would help with pooling of data across trials. To our knowledge there are no other recently published RCTs of individuals with MCI who have participated in a cognition-focused intervention, and whereby the acceptability and fidelity has been systematically reported.

In conclusion, this study showed that the PACE interventions were delivered in accordance to the program manual and that the project activities were well received by participants. Future studies will determine if the intervention is similarly well accepted in other clinical settings and if the efficacy of the program is directly related to acceptability and fidelity measures.
3.6 Authors Contributions

All authors are members of the PACE project group and participated in the conceptualization and implementation of the study. MV acts as guarantor of the data and has been responsible for the day-to-day supervision of research staff and delivery of the interventions. All investigators have contributed to design the study and to obtain funding. MV has drafted this manuscript, which has been critically reviewed by OA, NL, LC and LF.
CHAPTER 4

RESULTS
CHAPTER 4: RESULTS

This chapter was published in The American Journal of Geriatric Psychiatry:

4.1 Abstract

Objectives: The role of cognition-focused interventions (CFI) in reducing cognitive decline in older people remains uncertain. This study aimed to clarify whether a group cognitive activity (CA) strategy training program would decrease the 2-year rate of cognitive decline of people with mild cognitive impairment (MCI).

Design: Randomised controlled trial.

Setting: One study site.

Participants: 160 older adults with MCI ≥65 years of age (mean, 75 SD, 5.8).

Intervention: Five-week cognitive activity (CA) strategy training or a control non-specific educational program. The primary outcome measure was change from baseline in the total score on the Cambridge Cognitive Examination-Revised (CAMCOG-R). Secondary outcomes of interest included changes in memory, attention, executive functions, mood and quality of life. Endpoints were collected 10, 52 and 104 weeks post baseline.

Results: Intention to treat analysis identified no significant difference in CAMCOG-R scores over time between the two groups (mean difference=−0.36, 95%CI=−1.02,0.29) or across secondary outcome measures. The exceptions were better performance of the CA group on immediate attention (Digit Span Forwards, adjusted mean difference=0.15, 95%CI=0.01,0.30) and better quality of life (adjusted mean difference=0.57, 95%CI=0.10,1.04) compared to controls.

Conclusions: The devised program of CA did not improve general cognitive performance of older adults with MCI over a period of 2 years. Whilst favourable, the beneficial effects of the intervention on attention and quality of life were small, and of uncertain significance.
4.2 Objectives

With the ageing of the world’s population, dementia is becoming an increasingly important public health issue (3). Available treatments for Alzheimer’s disease do not alter disease progression and, therefore, focus has been shifting towards prevention. Identifying modifiable risk factors for dementia is a burgeoning area of interest, with significant attention being given to the benefits derived from participation in mentally stimulating activities. Observational studies have shown that people involved in such activities (e.g. reading, playing Mahjong) have better cognitive function and a reduced risk of dementia over time (267, 284, 285). Similarly, cognition-focused interventions (CFI) utilising relatively preserved cognitive functions aim to maintain or delay further decline (195). Improvements on subjective measures of mood and quality of life have also been reported (286), although, the clinical impact of CFI remains to be established.

There are, however, few randomised controlled trials (RCT) of CFI with older adults (healthy or otherwise) and, because of methodological shortcomings, their results have been difficult to generalise (195, 223, 231, 234, 235, 287). These issues were highlighted in a recent publication reviewing the varied therapeutic approaches targeting individuals with cognitive compromise and the lack of theoretically driven models for evaluating efficacy (288). Importantly, it remains to be established if participation in this type of intervention can prevent dementia. This is particularly pertinent for people with mild cognitive impairment (MCI), who are at increased risk of conversion to dementia (94). In light of the many varied factors that seem to influence cognitive functioning, individuals with MCI are viewed as an appropriate target group for dementia prevention strategies.
Identifying the role that CFI can play in stabilising or reversing decline in this group of patients would have significant public health implications.

The primary objective of the Promoting Healthy Ageing with Cognitive Exercise (PACE) RCT was to determine whether a cognitive activity (CA) strategy training program could decrease the rate of decline amongst older people with MCI over a follow up period of two years. To this end, participants were provided strategies and coaching during group sessions to enhance cognitive functioning. A non-specific educational “control” group were offered a 5-week program of more generalised presentations on healthy ageing and retirement. It was hypothesised that participants randomised to the CA group would experience less cognitive decline than older adults allocated to the educational group.
4.3 Methods

4.3.1 Participants and Design

This single-blind RCT was registered with the Australian Clinical Trials Registry (ACTRN12608000556347). Detailed information about the participants, training program, experimental design and outcome measures has been described elsewhere (289). Briefly, 324 community volunteers were screened for the presence of MCI according to published criteria (80). Clinical evaluation of MCI was established by identifying performances 1.5 SD below age and gender norms on any Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) cognitive task (249). Additionally, participants had to be aged 65 years or over, proficient in spoken and written English, and able to travel to the research centre. Individuals with an established diagnosis of dementia according to International Statistical Classification of Diseases and Related Health Problems Tenth Revision (ICD-10) criteria for research (282) or who showed signs of cognitive impairment (as evidenced by a Mini Mental State Examination (MMSE; 283) score of 23 or less) were excluded. Additional exclusion criteria included current psychiatric disorder, current hazardous or harmful alcohol consumption (based on (251)), or a medical condition that could compromise participation in the study tasks (such as sensory impairment) or reduce medium-term survival (e.g. advanced cancer). Individuals who reported a clinical history of stroke associated with permanent disability were also excluded. One hundred and sixty adults met criteria and attended a baseline assessment prior to being randomised into either the CA strategy training group or the control Education group. The Human Research Ethics Committees of the University of Western Australia and of the Royal Perth Hospital (RPH)
approved this study and all participants provided written informed consent. Procedures of this study followed the principles of the Declaration of Helsinki for Human Rights.

4.3.1.1 Outcome Measures and Timeline of the Study

Further assessments post baseline occurred at 10 weeks, 52 weeks and 104 weeks. The primary outcome measure was the Cambridge Cognitive Examination Revised (CAMCOG-R) (290), with participants also completing the California Verbal Learning Test – Second Edition (CVLT-II – standard and alternate forms) (291), Digit Span and Symbol Search subtests from the Wechsler Adult Intellectual Scale – Third Edition (WAIS-III) (261), the Trail Making Tests Part A and B and the Controlled Oral Word Association Test (COWAT) (292). Participants were also asked to complete questionnaires assessing mood, engagement in leisure activities, weekly physical activity, social support, quality of life and perception of memory. Within one to two weeks of completing their program, participants were invited to return for a post intervention assessment (10 week). This testing session took approximately 90 minutes to complete and was undertaken by a research assessor blinded to group enrolment. Table 1 provides information regarding the assessment battery and interpretation of scores, including supportive references.
Table 4.1. Outline of the assessments and timelines of the PACE trial. The X indicates at which point of the trial the respective assessments took place. Follow-up times relate to baseline testing.

<table>
<thead>
<tr>
<th>Assessment Tool</th>
<th>Clinical Screen</th>
<th>Baseline</th>
<th>10 weeks</th>
<th>52 weeks</th>
<th>104 weeks</th>
<th>Outcome Measure</th>
<th>Measure/Comment</th>
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<tr>
<td>PHQ-9 (293)</td>
<td>X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mood</td>
<td>Total Score (0-27) ↓Scores = ↑Mood</td>
</tr>
<tr>
<td>CERAD (249)</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Global Cognition</td>
<td>Individual Subtest Scores ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>MMSE (283)</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Global Cognition</td>
<td>Total Score (0-30) ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>AUDIT (251)</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol Use</td>
<td>Total Score (0-40) ↓Scores = ↓Consumption</td>
</tr>
<tr>
<td>SAILS (243)</td>
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<td></td>
<td></td>
<td></td>
<td>Functional Ability</td>
<td>Total Score (0-150) ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>MHQ</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Health Issues</td>
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</tr>
<tr>
<td>CAMCOG-R (290)</td>
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<td></td>
<td></td>
<td></td>
<td>Global Cognition</td>
<td>Total Score (0-105) ↑Scores = ↑ Performance</td>
</tr>
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<td>CVLT-II (256)</td>
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<td></td>
<td></td>
<td></td>
<td>Memory</td>
<td>Recall Scores ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>Digit Span (261)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Attention</td>
<td>Total Scores ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>Symbol Search (261)</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Processing Speed</td>
<td>Total Score (0-60) ↑Scores = ↑ Performance</td>
</tr>
<tr>
<td>TMTA (260)</td>
<td>X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Attention/Proc. Speed</td>
<td>Total Time (seconds) ↓Scores = ↑ Performance</td>
</tr>
</tbody>
</table>

159
<table>
<thead>
<tr>
<th>Assessment Tool</th>
<th>Clinical Screen</th>
<th>Baseline</th>
<th>10 weeks</th>
<th>52 weeks</th>
<th>104 weeks</th>
<th>Outcome Measure</th>
<th>Measure/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMTB (260)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Executive Functions</td>
<td>Total Time (seconds) ↓ Scores = ↑ Performance</td>
</tr>
<tr>
<td>COWAT (260)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Executive Functions</td>
<td>Total Score ↑ Scores = ↑ Performance</td>
</tr>
<tr>
<td>LAQ (267)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Leisure Activity</td>
<td>Rarely or Frequently</td>
</tr>
<tr>
<td>PAQ (268)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Physical Activity</td>
<td>Active (≥ 2.5 hrs) or Inactive (&lt;2.5 hrs)</td>
</tr>
<tr>
<td>SNSQ (269)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Social Activity</td>
<td>Total Score (7-21) ↑ Scores = ↑ Support</td>
</tr>
<tr>
<td>MFQ (271)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Perception of Memory</td>
<td>Total Scale Score ↑ Scores = ↓ Concern</td>
</tr>
<tr>
<td>QOL-AD (272)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Quality of Life</td>
<td>Total Score (13-52) ↑ Scores = ↑ Quality</td>
</tr>
</tbody>
</table>

A booster telephone call took place at 24 weeks, with a face to face booster at 52 weeks.
↓ = Lower; ↑ = Higher; PHQ-9=Patient Health Questionnaire-Nine Item; CERAD=Consortium to Establish a Registry for Alzheimer’s Disease; MMSE=Mini Mental State Examination; AUDIT=Alcohol Use Disorders Identification Test; SAILS=Structured Assessment of Independent Living Skills; MHQ=Medical Health Questionnaire; CAMCOG-R=Cambridge Cognitive Examination-Revised; CVLT-II=California Verbal Learning Test- Second Edition; TMT=Trail Making Tests; COWAT=Controlled Oral Word Association Test; LAQ=Leisure Activity Questionnaire; PAQ=Physical Activity Questionnaire; SNSQ=Social Network Satisfaction Questionnaire; MFQ=Memory Functioning Questionnaire; QOL-AD=Quality of Life in Alzheimer’s Disease.
4.3.1.2 Randomisation, Sample Size and Power Calculation

Randomisation was undertaken in blocks of 12 to 18 according to a random list of numbers generated by computer, with six to nine individuals allocated to each group. The allocation list was handled by an independent investigator not involved in the assessments or delivery of the intervention. Due to the nature of the intervention, participants were not blinded to group membership; however, research assistants undertaking the follow-up assessments were. Participants and staff conducting the assessments were explicitly asked to not discuss information regarding the intervention. We are not aware of any breaches of protocol in this regard.

Older people living in the community lose approximately 1.6 points per year on the CAMCOG-R (294). Considering a possible 20% loss to follow up, with 64 people in each group, we calculated that the study would have 80% power to detect a between-group difference of 1.5 points on the CAMCOG-R (moderate effect size (0.5) over time, consistent with delay in the progression of cognitive decline of about 12 months.

4.3.1.3 Intervention

Each program was administered to groups of six to nine individuals, with participants attending ten 90-minute sessions over a 5-week period (2 sessions per week). A detailed description of the content of the programs has been published elsewhere (Vidovich et al. 2009 (281)). Briefly, the focus of the CA intervention was to discuss age-associated changes in cognition, with opportunity to undertake activities illustrating strategies to enhance attentional capacity, memory functions and executive processes. This information
was adapted for application in everyday life to improve how participants managed their cognitive difficulties and offer the opportunity to practise these in a group setting. The sessions and strategies incorporated elements of cognitive rehabilitation, cognitive stimulation and cognitive training. This form of cognition-focused intervention was chosen to overcome some of the limitations of other approaches, offer a format suitable for group delivery, be person-centred and to address the particular needs of people with MCI. Each session was divided into two halves separated by a 10 to 15 minute tea break.

The control Education group was provided with a series of presentations on healthy ageing, including the impact of lifestyle factors. Sessions comprised watching videos and group discussion. Topics included memory functioning and dementia, physical activity and diet, stress and depression, sleep and sleep disturbance in older adulthood, the effects of retirement and community safety. Each session was also divided into two halves separated by a 10 to 15 minute tea break.

A Clinical Neuropsychologist ran each of the groups, exposing the participants to the same intervention format, amount of instructor time and social contact. All participants were given a manual containing the session content and material. Participants were not required to engage in any additional activities beyond that delivered during their contact in group sessions. Participants in the CA strategy training program were actively encouraged to incorporate the strategies discussed during their sessions into their daily routines. At six months post baseline participants received a “booster” telephone call which consisted of a summation of their program material and addressed any concerns. Thirty
minutes of additional pencil and paper tasks was posted to participants in the CA strategy training group for completion prior to the booster call and served as the basis for discussion during the telephone contact. A face-to-face booster session was also conducted in small groups with participants approximately one month after their 52 week follow-up assessment. All booster sessions were conducted by the Clinical Neuropsychologist who had run the group interventions.

4.3.1.4 Fidelity assessment

A fidelity study of the intervention showed that sessions were delivered as planned and per protocol (Vidovich et al. 2013 (295)). Calculation of a fidelity score based on 44 randomly selected sessions revealed results of 96.1 % (SD 2.39; 95% CI 95.1, 97.1) and 94.7% (SD 4.40; 95% CI 92.87, 96.55) for the CA strategy training and control group respectively, indicating a high level of consistency with regard to the manualised presentation content.

4.3.1.5 Statistical analyses

The data were managed and analysed using Stata 12.1 (StataCorp). We used descriptive statistics to summarise numerical (mean, standard deviation, and 95% confidence interval (CI), of the mean) and categorical data (number and proportions), t-tests and Pearson chi-square ($X^2$) statistics to compare participants randomly assigned to the interventions (numerical and categorical data, respectively). The primary analyses of the study were intention-to-treat and used all available information on generalised linear mixed models for repeated measures (effect of time), with each person treated as a random effect (xtmixed command). We initially investigated the effect of the interaction between time (10, 52 and
104 weeks) and the intervention on the outcomes of interest, but later dropped the interaction terms from all analyses as they were not statistically significant (p>0.1). Due to imbalance in the distribution of gender in the study groups after randomisation, the variable was entered as a co-variate in all analyses. The analysis of the primary outcome measure (CAMCOG-R) was subsequently repeated excluding participants who had not adhered to the intervention (i.e., they completed six or less of the ten sessions of the program) and again for those who had provided valid outcome data at all assessments (completers). Finally, we used the Pearson chi-square statistic to analyse the impact of the intervention on the diagnosis of MCI at the end of the follow-up period and on the proportion of participants lost during follow-up.

Alpha was set at 5% and all tests reported are two-tailed.
4.4 Results

One hundred and sixty older adults with MCI were randomly assigned to the control or CA strategy training interventions (1:1 allocation). Figure 4.1 summarises the flow of participants over two years. At the end of the 10-week intervention, 1 control and 3 participants in the CA strategy training group did not provide valid follow up data. At the 12-month assessment, 3 controls and 3 people in the CA strategy training group did not contribute valid outcome data, whereas at the 24-month assessment outcome data were not available for 20 controls and 13 CA strategy training participants. The age of participants ranged from 65 to 92 years and 86 (53.7%) of them were women. Table 4.2 summarises the demographic and clinical characteristics of participants according to their group allocation at the time of randomisation. The groups were well balanced for all variables, except for gender: there were more women in the CA strategy training than control group ($X^2=6.44$, df=1, p=0.011).
Figure 4.1. Flowchart of participants in the control and cognitive activity groups from screening to the end of the follow up period of 2 years.
Table 4.2. Demographic and clinical characteristics at the time of randomisation.

<table>
<thead>
<tr>
<th>Characteristic/Measure</th>
<th>Controls (n=80)</th>
<th>Cognitive activity (n=80)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, mean years (SD)</td>
<td>74.9 (5.5)</td>
<td>75.1 (6.1)</td>
<td>0.760</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>35 (43.7)</td>
<td>51 (63.7)</td>
<td>0.011</td>
</tr>
<tr>
<td>NESB, n (%)</td>
<td>4 (5.0)</td>
<td>8 (10.0)</td>
<td>0.230</td>
</tr>
<tr>
<td>High school education, n (%)</td>
<td>29 (36.2)</td>
<td>26 (32.5)</td>
<td>0.618</td>
</tr>
<tr>
<td><strong>Lifestyle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUDIT</td>
<td></td>
<td></td>
<td>0.943</td>
</tr>
<tr>
<td>Non drinkers, n (%)</td>
<td>12 (15.0)</td>
<td>13 (16.2)</td>
<td></td>
</tr>
<tr>
<td>Low-risk, n (%)</td>
<td>61 (76.2)</td>
<td>61 (76.2)</td>
<td></td>
</tr>
<tr>
<td>Risky, n (%)</td>
<td>7 (8.7)</td>
<td>6 (7.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td>0.211</td>
</tr>
<tr>
<td>Never, n (%)</td>
<td>40 (50.6)</td>
<td>50 (63.3)</td>
<td></td>
</tr>
<tr>
<td>Past, n (%)</td>
<td>36 (45.6)</td>
<td>28 (35.4)</td>
<td></td>
</tr>
<tr>
<td>Current, n (%)</td>
<td>3 (3.8)</td>
<td>1 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Physically active, n (%)</td>
<td>26 (32.5)</td>
<td>25 (31.2)</td>
<td>0.865</td>
</tr>
<tr>
<td><strong>Leisure Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plays Board Games rarely, n (%)</td>
<td>74 (92.5)</td>
<td>68 (85.0)</td>
<td>0.133</td>
</tr>
<tr>
<td>Reads Novels/Books rarely, n (%)</td>
<td>39 (48.75)</td>
<td>45 (56.25)</td>
<td>0.342</td>
</tr>
<tr>
<td>reads newspapers/journals rarely, n (%)</td>
<td>17 (21.25)</td>
<td>19 (23.75)</td>
<td>0.705</td>
</tr>
<tr>
<td>Plays a musical instrument rarely, n (%)</td>
<td>77 (96.2)</td>
<td>78 (97.5)</td>
<td>0.650</td>
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<tr>
<td>Crossword puzzles/Sudoku rarely, n (%)</td>
<td>63 (78.75)</td>
<td>50 (62.5)</td>
<td>0.024</td>
</tr>
<tr>
<td>Writes letters/novels/emails rarely, n (%)</td>
<td>57 (71.25)</td>
<td>57 (71.25)</td>
<td>1.000</td>
</tr>
<tr>
<td>Participates in Grp Discussion rarely, n (%)</td>
<td>64 (80.0)</td>
<td>68 (85.0)</td>
<td>0.405</td>
</tr>
<tr>
<td><strong>Clinical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis, n (%)</td>
<td>39 (48.75)</td>
<td>40 (50.0)</td>
<td>0.874</td>
</tr>
<tr>
<td>Diabetes, n (%)</td>
<td>8 (10.0)</td>
<td>12 (15.0)</td>
<td>0.339</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>38 (47.5)</td>
<td>36 (45.0)</td>
<td>0.751</td>
</tr>
<tr>
<td>Stroke, n (%)</td>
<td>6 (7.5)</td>
<td>8 (10.0)</td>
<td>0.576</td>
</tr>
<tr>
<td>Heart Attack, n (%)</td>
<td>14 (17.5)</td>
<td>15 (18.7)</td>
<td>0.837</td>
</tr>
<tr>
<td>Heart Failure, n (%)</td>
<td>3 (3.75)</td>
<td>6 (7.5)</td>
<td>0.303</td>
</tr>
<tr>
<td>Poor Circulation, n (%)</td>
<td>18 (22.5)</td>
<td>21 (26.2)</td>
<td>0.581</td>
</tr>
<tr>
<td>Asthma, n (%)</td>
<td>16 (20.0)</td>
<td>13 (16.2)</td>
<td>0.538</td>
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<tr>
<td>Emphysema, n (%)</td>
<td>5 (6.25)</td>
<td>4 (5.0)</td>
<td>0.732</td>
</tr>
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<td>Osteoporosis, n (%)</td>
<td>18 (22.5)</td>
<td>26 (32.5)</td>
<td>0.157</td>
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<td>Characteristic/Measure</td>
<td>Controls (n=80)</td>
<td>Cognitive activity (n=80)</td>
<td>p-value</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Clinical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer, n (%)</td>
<td>11 (13.7)</td>
<td>14 (17.5)</td>
<td>0.514</td>
</tr>
<tr>
<td>Depression, n (%)</td>
<td>26 (32.5)</td>
<td>16 (20.0)</td>
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<tr>
<td>Dementia, n (%)</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Anxiety, n (%)</td>
<td>15 (18.7)</td>
<td>10 (12.5)</td>
<td>0.276</td>
</tr>
<tr>
<td>Thyroid Disorder, n (%)</td>
<td>13 (16.2)</td>
<td>8 (10.0)</td>
<td>0.242</td>
</tr>
<tr>
<td>Closed Head Injury, n (%)</td>
<td>11 (13.7)</td>
<td>11 (13.7)</td>
<td>1.000</td>
</tr>
<tr>
<td>SAILS, mean score (SD)</td>
<td>148.3 (1.2)</td>
<td>148.1 (1.6)</td>
<td>0.677</td>
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<tr>
<td><strong>Psychosocial Measures</strong></td>
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<tr>
<td>PHQ-9, mean score (SD)</td>
<td>4.3 (4.6)</td>
<td>4.0 (3.6)</td>
<td>0.783</td>
</tr>
<tr>
<td>QoL, mean score (SD)</td>
<td>38.9 (5.0)</td>
<td>37.8 (4.8)</td>
<td>0.156</td>
</tr>
<tr>
<td>SNSQ, mean score (SD)</td>
<td>19.1 (2.9)</td>
<td>19.2 (2.1)</td>
<td>0.511</td>
</tr>
<tr>
<td>MFQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Frequency of Forgetting, mean (SD)</td>
<td>117.3</td>
<td>117.0</td>
<td>0.931</td>
</tr>
<tr>
<td>Seriousness of Forgetting, mean (SD)</td>
<td>76.4 (18.6)</td>
<td>74.2 (21.2)</td>
<td>0.406</td>
</tr>
<tr>
<td>Retrospective Functioning, mean (SD)</td>
<td>15.8 (6.2)</td>
<td>16.3 (7.0)</td>
<td>0.624</td>
</tr>
<tr>
<td>Mnemonics Usage, mean (SD)</td>
<td>24.9 (8.2)</td>
<td>24.7 (9.8)</td>
<td>0.919</td>
</tr>
</tbody>
</table>

NESB=Non English Speaking Background; AUDIT=Alcohol Use Disorders Identification Test; SAILS=Structured Assessment of Independent Living Skills; PHQ-9=Patient Health Questionnaire-Nine Item; QOL-AD=Quality of Life in Alzheimer’s Disease; SNSQ=Social Network Satisfaction Questionnaire; MFQ=Memory Functioning Questionnaire
Table 4.3 summarises the cognitive outcome measures of the study before the intervention started. Participants assigned to the control and CA strategy training groups showed similar abilities across all measures. Changes of scores on outcome measures immediately post the intervention and again after 52 weeks and 104 weeks are displayed in Table 4.4. The CA strategy training intervention did not affect CAMCOG-R scores (primary outcome measure) over time compared with controls (mean difference -0.36, 95%CI=-1.02,0.29 results controlled for gender imbalance and baseline score). The CA strategy training intervention had no effect on all but 3 secondary outcome measures: participants in the CA strategy training group had marginally better scores on digit span forwards (adjusted mean difference=0.15, 95%CI=0.01,0.30) and quality of life scores during follow up (adjusted mean difference=0.57, 95%CI=0.10,1.04). They also reported comparatively less concern about the need for use of mnemonics than controls (adjusted mean difference=-1.07, 95%CI=-2.12,-0.02). All analyses were controlled for gender and respective baseline scores.

We also investigated the effect of the intervention on those who participated in at least 70% of the intervention sessions (i.e., those who showed acceptable adherence: 70 controls and 66 CA strategy training individuals). There was no obvious effect on CAMCOG-R scores when analyses were limited to those who had adhered to the intervention (adjusted mean difference=-0.15, 95%CI=-0.85,0.56; adjusted for gender and baseline score). A case-complete analysis (i.e., limited to the 60 controls and 67 CA strategy training participants who completed all assessments) confirmed that the intervention had no obvious effect on CAMCOG-R scores over time (adjusted mean difference=-0.36, 95%CI=-1.02,0.29).
Table 4.3. Mean scores and 95% confidence interval (95%CI) of cognitive measures at the baseline assessment.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Controls (n=80)</th>
<th>Cognitive activity (n=80)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMCOG-R score</td>
<td>90.7 (90.5,90.8)</td>
<td>89.5 (89.3, 89.7)</td>
<td>0.277</td>
</tr>
<tr>
<td>CVLT-II Total Recall</td>
<td>37.1 (36.8,37.4)</td>
<td>38.1 (37.8,38.4)</td>
<td>0.584</td>
</tr>
<tr>
<td>CVLT-II Short Delay Free Recall</td>
<td>6.1 (6.0,6.2)</td>
<td>6.5 (6.4,6.6)</td>
<td>0.512</td>
</tr>
<tr>
<td>CVLT-II Long Delay Free Recall</td>
<td>6.4 (6.3,6.5)</td>
<td>6.8 (6.7,6.9)</td>
<td>0.447</td>
</tr>
<tr>
<td>Digit Span Forward Span</td>
<td>5.9 (5.8,5.9)</td>
<td>6.1 (6.0,6.1)</td>
<td>0.277</td>
</tr>
<tr>
<td>Digit Span Backward Span</td>
<td>4.3 (4.3,4.3)</td>
<td>4.4 (4.4,4.4)</td>
<td>0.475</td>
</tr>
<tr>
<td>Digit Span Total Score</td>
<td>14.5 (14.4,14.6)</td>
<td>15.1 (15.0,15.1)</td>
<td>0.273</td>
</tr>
<tr>
<td>TMT A time (sec)</td>
<td>46.0 (45.6,46.4)</td>
<td>46.0 (45.4,46.5)</td>
<td>0.984</td>
</tr>
<tr>
<td>TMT B time (sec)</td>
<td>142.6 (140.6,144.6)</td>
<td>143.2 (141.0,145.4)</td>
<td>0.961</td>
</tr>
<tr>
<td>Symbol Search (items completed)</td>
<td>19.7 (19.5,19.8)</td>
<td>21.0 (20.8,21.2)</td>
<td>0.240</td>
</tr>
<tr>
<td>COWAT Total Score</td>
<td>36.2 (35.9,36.5)</td>
<td>35.5 (35.1,35.8)</td>
<td>0.694</td>
</tr>
</tbody>
</table>

We then examined whether the intervention contributed to change the MCI classification of participants during follow up (Table 4.5). “Memory complainers” were those participants who no longer met MCI criteria. Those characterised as “amnestic” obtained a score on any one of the memory tasks from the CERAD (with the exception of the recognition trials) below normative cut-offs. “Non-amnestic” demonstrated impairment in a domain other than memory (e.g. praxis, naming, fluency). Those with impairment upon more than one measure were labelled with “plus”. At the 52-week assessment, 27/77 controls and 34/77 CA strategy training participants no longer met criteria for MCI (OR=1.46, 95%CI=0.72,2.95), whereas at the 104-week assessment the numbers were 27/60 and 25/67 (OR=0.73, 95%CI=0.34,1.57). Finally, we examined whether the intervention was associated with differential loss to follow up: there was no difference between the 2 study groups (OR=0.58, 95%CI=0.24,1.36).
Table 4.4. Observed mean difference compared with baseline of outcome measures over 2 years for controls and cognitive activity participants.

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>Controls Mean (95% CI)</th>
<th>N</th>
<th>Cognitive activity Mean (95% CI)</th>
<th>Statistic (z)</th>
<th>p-value*</th>
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<tr>
<td>10 weeks</td>
<td>79</td>
<td>1.8 (1.1,2.5)</td>
<td>77</td>
<td>2.0 (1.1,2.9)</td>
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<tr>
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<td>67</td>
<td>-0.6 (-2.3,1.0)</td>
<td>-0.35</td>
<td>0.730</td>
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<tr>
<td>CVLT-II Total Recall</td>
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<tr>
<td>10 weeks</td>
<td>78</td>
<td>-3.0 (-4.6,-1.3)</td>
<td>77</td>
<td>-1.8 (-3.5,-0.1)</td>
<td>-0.35</td>
<td>0.730</td>
</tr>
<tr>
<td>52 weeks</td>
<td>76</td>
<td>0.2 (-1.4,1.9)</td>
<td>77</td>
<td>-0.6 (-2.4,1.2)</td>
<td>-0.35</td>
<td>0.730</td>
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<tr>
<td>104 weeks</td>
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<td>67</td>
<td>-3.1 (-5.5,-0.7)</td>
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<td>0.730</td>
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<td>78</td>
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<td>77</td>
<td>0.1 (-0.5,0.7)</td>
<td>0.10</td>
<td>0.923</td>
</tr>
<tr>
<td>52 weeks</td>
<td>76</td>
<td>0.2 (-0.4,0.8)</td>
<td>77</td>
<td>-0.0 (-0.7,0.6)</td>
<td>0.10</td>
<td>0.923</td>
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<tr>
<td>104 weeks</td>
<td>59</td>
<td>-0.2 (-1.0,0.6)</td>
<td>67</td>
<td>-0.3 (-1.0,0.5)</td>
<td>0.10</td>
<td>0.923</td>
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<td>77</td>
<td>0.0 (-0.6,0.6)</td>
<td>-0.35</td>
<td>0.730</td>
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<tr>
<td>52 weeks</td>
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<td>-0.0 (-0.6,0.6)</td>
<td>77</td>
<td>-0.3 (-1.0,0.4)</td>
<td>-0.35</td>
<td>0.730</td>
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<tr>
<td>104 weeks</td>
<td>59</td>
<td>-0.5 (-1.3,0.2)</td>
<td>67</td>
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<td>77</td>
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<td>0.140</td>
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<td>N</td>
<td>Cognitive activity Mean (95% CI)</td>
<td>Statistic (z)</td>
<td>p-value*</td>
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<tr>
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<tr>
<td>104 weeks</td>
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<tr>
<td>Measure</td>
<td>N</td>
<td>Controls Mean (95% CI)</td>
<td>N</td>
<td>Cognitive activity Mean (95% CI)</td>
<td>Statistic (z)</td>
<td>p-value*</td>
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<tr>
<td>104 weeks</td>
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<td>0.3 (-0.2,0.8)</td>
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<tr>
<td>104 weeks</td>
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<td>104 weeks</td>
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<tr>
<td>104 weeks</td>
<td>59</td>
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<td>-2.2 (-4.0,-0.4)</td>
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Z: z-statistic derived from a multilevel mixed model.
*p-value associated with the main effect of group (all interaction terms between time and group were not significant). The analyses were adjusted for gender and baseline scores of respective tests (i.e., all models had 4 degrees of freedom). 95% CI: 95% confidence interval of the mean difference. CAMCOG-R=Cambridge Cognitive Examination-Revised; CVLT-II=California Verbal Learning Test-Second Edition; TMT=Trail Making Tests; COWAT=Controlled Oral Word Association Test; PHQ-9=Patient Health Questionnaire-Nine Item; QOL-AD=Quality of Life in Alzheimer’s Disease; SNSQ=Social Network Satisfaction Questionnaire; SAILS=Structured Assessment of Independent Living Skills; MFQ=Memory Functioning Questionnaire.
Table 4.5. Change in mild cognitive impairment (MCI) status over time.

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<th>Controls</th>
<th>Cognitive activity</th>
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<td>N per status (%)</td>
<td>Total N = 80</td>
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<td>5 (9)</td>
<td>3 (5)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic plus</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Over the course of the trial, 16 individuals received a diagnosis of dementia from their treating doctor. Four of them (two from each group) dropped out of the study after completing their 52-week assessment, with the other 12 individuals continuing to the final data collection point. Of these 16 individuals with dementia, 10 had been randomly assigned to CA strategy training. The review of participants’ MMSE scores during follow-up showed that by 24 months, 11 participants had MMSE scores of <24, 9 of whom were in the CA strategy training group. Analysis of the odds of attaining a MMSE <24 at the 12 and 24 month assessments, adjusting for baseline MMSE, showed that people in the CA strategy training group had a non-significant increased odds of experiencing cognitive impairment compared with controls (OR=3.48, 95%CI=0.92,13.18).

4.4.1 Acceptability of Program

The acceptability of the program was investigated to identify consumer satisfaction with the interventions, the details of which have been reported elsewhere (295). Session attendance was equivalent between the groups and in each group over 80 percent of participants attended seven or more sessions. At program completion, participants completed a questionnaire regarding their perceptions of the intervention. Seventy four feedback forms were collected from the CA strategy training group and 68 from the controls. Both groups indicated that the programs were relevant to their needs; however the CA strategy training group reported the intervention to be significantly more relevant (p<0.001). Each program was rated equally highly with respect to clarity and interest and over 90% of all participants surveyed indicated they would attend this sort of program in their local area. More than
70% were willing to pay a fee, with no differences between the groups in their ratings (p>0.1).
4.5 Conclusions

PACE recruited 160 older adults with MCI to determine whether a 5-week CA strategy training program would decrease the rate of cognitive decline over two years. Analysis of our primary outcome measure, the CAMCOG-R, showed no effect of the intervention compared with controls. Two of our secondary measures seemed to favour the intervention (digit span and QoL), although effect sizes were small and of questionable clinical significance.

Whilst identifying factors contributing to the lack of intervention effect is challenging, the following warrants consideration. The gender imbalance and excess of amnestic MCI in the CA group could have biased the outcomes, although statistical adjustment did not alter the results. Moreover, the usefulness of the diagnosis of MCI has been questioned because of its notorious instability over time (89, 94). More than one third of the participants in our groups no longer met criteria for MCI at the 52 and 104 week follow-up periods and this is consistent with previous comment regarding change in status with time (84). Another issue relates to the sensitivity of the outcome measures (235). We chose the CAMCOG-R because this instrument has previously been shown to be sensitive to change over time (294), although change in this MCI sample was minimal and, during the initial 12 months, scores actually improved in both groups, possibly as a consequence of practice. In addition, our secondary measures included the assessment of specific cognitive domains, such as attention, memory, processing speed and executive functions. The improvement in immediate attention associated with the intervention did not appear to have implications for performance on additional tasks (e.g. translating to enhanced memory recall) and it remains
uncertain if this effect reflects real improvement or is merely a chance finding attributable to type I error. The possibility that knowledge of specific strategies altered the test-taking approach adopted by participants is entertained, however we did not systematically collect data regarding these behaviours. Interestingly, participants receiving the active intervention reported improved quality of life (QoL) and less reliance on the use of mnemonic strategies to enhance memory in day-to-day situations. Improvements in QoL have been reported in other CFI (286), and one might speculate that participation in the intervention was associated with a modest increase in confidence and well being despite this not appearing to translate into quantitative findings on objective test measures. Participation in the CATS program may have induced a false sense of security regarding memory ability; with individuals feeling that strategy use was no longer necessary. Unfortunately, neither self-report nor collateral measures of daily functioning were included and it remains unclear as to any potential study impact on instrumental activities of daily living. We adopted a practical measure (the SAILS), however due to the relatively high functioning nature of our MCI group, performances were at ceiling initially and did not change significantly over the length of study involvement.

The nature of the CA strategy training program and the amount of content delivered over a relatively short time frame was possibly insufficient to lead to noticeable improvements or to afford opportunity to master skills or strategies necessary to translate into quantitative gains in cognition. Further, we did not objectively measure how actively participants were utilising the information they were taught and trained at. Hence, whilst providing training and strategies to circumvent cognitive difficulties and increase participation in mentally
stimulating activities, the intervention may have failed to lead to behavioural changes. Alternatively, as both programs were well received, it is possible that the lack of a differential effect of the intervention was due to a positive effect of the control educational activity. It is unknown whether the material presented in the education group influenced lifestyle choices (e.g. diet and exercise), although the educational material presented during the trial made no direct mention of this issue. Notwithstanding the non-specific content of our ‘control’ intervention, it is possible that certain unmeasured behaviours of participants could have affected the cognitive outcomes of people assigned to the educational control group. Participation in the control group exposed individuals to social interaction and stimulation, which is very different from a wait-list control or “usual care group”. This form of control group was utilised to maximise retention of study participants. It may be the case that participation in any mentally stimulating activity is beneficial regardless of its cognitive content. Similar findings were reported by a recent RCT with inactive older adults allocated to mental activity and physical activity intervention and control groups (2x2 factorial design) (296): there was no statistically significant difference between the groups, although all groups improved over 12 weeks. Practice effects or activity amount (not type), were postulated as potential reasons for the outcomes of the study (296).

The results of previous CFI trials with similarly aged participants with MCI have yielded both negative and positive findings. Rapp and colleagues (297) engaged community dwelling individuals with MCI in a multi-faceted intervention (memory training, relaxation training, cognitive restructuring) over a six week period, once a week, for 120 minutes and used a no treatment control group. Despite subjective improvement in memory, no
significant benefits were observed on objective test measures (297). A lack of positive findings on objective outcome measures of memory was also noted by Troyer and colleagues (298) who randomised 54 participants with amnestic MCI to treatment or a wait-list control condition. The intervention consisted of ten 2-hour sessions over six months. Whilst there were significant differences in the knowledge and application of memory strategies, no practical objective cognitive benefit was demonstrated. Similarly, no significant differences on outcome measures of cognitive function were observed in the RCT conducted by Jean et al (299). Regardless of the memory training technique implemented, the two intervention groups showed similar improvements. Adopting a multi-modal approach, Tsolaki et al (300) concluded that it was possible to improve cognitive and functional performance in participants with MCI. However, despite the nature of the intervention there was no discussion regarding the observed pattern of performances on only seven of the 21 objective measures and the statistical analysis adopted did not permit a thorough interpretation of pre and post intervention changes.

Kinsella et al (301) reported encouraging outcomes following their RCT of 54 participants with amnestic MCI. Inspection of their results revealed improvement on a measure of prospective memory after training participants on strategies to manage every day memory problems. The investigators noted that at the longest follow-up period (four months) the effect was no longer present. Finally, Huckans et al (288) conceded that reviewed data regarding the effectiveness of cognitive rehabilitation therapies for individuals with MCI remains “promising” though “inconclusive” and advocate for ongoing trials with more stringent study designs.
PACE was a single-site RCT utilising community volunteers who were interested in participating due to concerns regarding memory. Hence, these findings require replication. Whilst possibly our study lacked power to detect differences between the groups over time, the confidence intervals of our effects estimates reveal that any putative effects missed would have been too small to be of clinical relevance. Due to our limited sample size, we lacked power to investigate “conversion” to dementia. However, our analyses suggest an association in the opposite direction of that expected: more people in the CA strategy training than control group showed evidence of cognitive impairment at the end of the follow up period.

In summary, whilst the PACE study was well received by participants, this form of CFI failed to decrease the 24-month rate of cognitive decline among older people with MCI. Other demonstrably effective interventions are needed to address this increasingly important public health issue.
4.6 Authors Contributions

All authors (except KM) are members of the PACE project group and participated in the conceptualisation and implementation of the study. All PACE investigators contributed to design the study and to obtain funding. MV acts as guarantor of the data and has been responsible for the day-to-day supervision of research staff and delivery of the interventions. MV, OPA and KM analysed the data. MV drafted the manuscript with the assistance of OPA, which was later critically reviewed by NL, LC and LF. All authors have approved the submission of the present paper to The American Journal of Geriatric Psychiatry.
CHAPTER 5

SUMMARY AND CONCLUSIONS
CHAPTER 5: SUMMARY AND CONCLUSIONS

5.1 Study Aims and Hypotheses Revisited

The Promoting Health Ageing with Cognitive Exercise (PACE) study was designed to determine whether a structured program of cognitive activity (CA) strategy training could delay progression of cognitive decline amongst a group of older adults at increased risk of dementia – those with a diagnosis of mild cognitive impairment (MCI). The proposed study aimed to improve the understanding of possible modifying factors of cognition and highlight the potential effect of the intervention in an older age population. One hundred and sixty participants aged 65 years or older who fulfilled the study criteria for MCI were randomly assigned to either a CA strategy training group or an educational control group. Each group participated in a five-week manualised program and the cognitive performances, quality of life and functional level of both groups were monitored across multiple time points.

It was hypothesised that older adults with MCI randomised to an intervention of CA strategy training would experience less cognitive decline, as measured by a standardised global test of cognitive function (CAMCOG-R), over a 12-month period compared with participants assigned the control education intervention. With the subsequent acquisition of further funding, the trial was extended and participants were invited to remain in the study for an additional 12 months (i.e., 24 months in total). It was predicted that the CA group would demonstrate stronger performances than the education group on secondary outcome measures of memory, attention, processing speed and executive functions across all time
points. A series of self-report questionnaires were also included to afford insight into the
degree to which each of the intervention programs influenced different lifestyle aspects and
well-being.
5.2 Practical and Theoretical Implications of Findings

We undertook to establish the acceptability and fidelity of our intervention. Attendance between the two treatment groups was comparable, as were their impressions of the study content material and willingness to participate in such a program were it to be made available within a community setting. Not unexpectedly, those older adults in the CA group rated the program to be significantly more relevant to their needs. Assessment of treatment fidelity and, more specifically, delivery of the intervention, revealed high consistency. This was likely influenced by having manualised the program interventions and by the recording of the sessions.

Thus, the intervention was well received by participants, with the content and presentation of material delivered at an appropriate level and considered relevant and suitable to their perceived needs. There were also no apparent contamination evident with respect to the manner with which the session material was delivered both across and within groups.

Analysis of our primary outcome measure, the CAMCOG-R, showed no effect of the active compared with the control intervention. Two of our secondary measures seemed to favour the active intervention (digit span and QoL), although effect sizes were small and of questionable clinical significance. It is however noteworthy that improvement on ratings of quality of life has been observed in other studies (e.g. (231, 235)) and a relationship between perceived health and well-being and memory complaints, would not be surprising. An association with improved memory confidence and self-perceptions regarding the need to utilise memory aids may also have factored in to our observation that those in the CA
strategy training group did not appear as reliant on the use of mnemonic strategies to assist in day-to-day activities. Although the PACE study was well received by participants, this form of cognition focussed intervention (CFI) failed to decrease the 12- and 24-month rate of cognitive decline among older people with MCI.

A number of potential contributing factors to a lack of observed intervention effect were proposed in Chapter 4. These included the participant sample (i.e., gender and amnestic MCI imbalance), the diagnosis of MCI, the sensitivity of the outcome measures and potential practice effects. Whilst it has been recognised that gender differences in disease incidence, cognitive functioning and psychotherapy outcomes may influence results from psychosocial interventions with older adults (302), controlling for imbalances in participant baseline characteristics did not significantly alter the findings. It is important to acknowledge that the nature and dosage of the intervention itself (e.g., content; time frame of delivery; frequency of booster sessions) may have been insufficient to afford any quantitative gains in cognitive functioning. The concept of a “prescribed dose” of intervention remains highly attractive, albeit elusive, and needs to be balanced between the practicalities of delivery time frames and maintaining interest in participation.

Both of our interventions were well received and promoted a similar level of social interaction and exposure to the facilitator. Previous studies have also recognised the potential of social interaction and support on outcome results (167, 168, 296). Hence, it is possible that the lack of difference between the groups may have been due to a significant “treatment effect” associated with the control intervention. In their meta-analysis, Martin et
al. (2011) concluded that alternate (control) interventions for MCI participants were as similarly positive as the cognitive interventions, implying that training interventions could not be regarded as effective, given that improvements were not over and above the effects of active control conditions (233). Reijnders et al. (2013) has also found that when active control conditions are implemented with individuals with MCI, limited positive effects are observed on objective and subjective cognitive outcomes (137).

A lack of robust evidence of clinically significant findings is certainly not specific to the PACE trial, with careful systematic analysis suggesting that with few exceptions, the impact of CFI, particularly with respect to “real-life” activities, is minimal (234). Whilst comparison between a series of CFI with similarly aged MCI participants, utilising more traditional (and non-computerised) methods of intervention, reveals a tendency to implement a “no treatment” or “wait-list” control group (see Table 5.1), the efficacy of these interventions has not been established. Mixed outcomes, and highly varied periods of intervention are apparent. Whilst the trial conducted by Tsolaki et al. (2011) appears to demonstrate the most consistent and significant differences, the time invested in the intervention is also clearly substantial relative to other trials.

Presently, the balance of available research data suggests that there is limited cognitive benefit to be gained from participating in CFI. Results from the PACE study are consistent with these conclusions. Whilst this does not discount a possible place for these types of treatments with some older adult populations, it does imply a need for attention to the way such interventions are promoted together with close evaluation of cost-benefit trade offs.
Time devoted to repetitive training exercises or specific rehabilitation of single cognitive domains, is also time away from other activities that may benefit cognitive and physical health of older adults (e.g. exercising, socialising with friends and family, exploring new hobbies). Further, the cost of delivery of such programs (either home based or community interventions) may be objectionable if their benefits do not appear to translate into clinically significant better health and psychological outcomes, something that remains to be seen given the limited number of longer term follow-up studies. If engagement in activity, of any sort, is the key to enhancing cognition (as is suggested by the PACE study) then interventions might best be directed towards identifying ways to develop personal interests (e.g. studying art, wood work, music, geography). This approach would cater for a broader scope of activity and individualised pursuits and, therefore, optimise opportunity for maintaining engagement.
Table 5.1 Intervention characteristics of RCTs similar to PACE.

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Intervention Aim</th>
<th>Duration (Total Hours)</th>
<th>Control Condition</th>
<th>Outcome Measures and Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapp et al. (2002)</td>
<td>19</td>
<td>Information on memory and training on strategies</td>
<td>2 hrs per week (12)</td>
<td>No treatment</td>
<td>Cognitive and mood measures. No significant difference between groups.</td>
</tr>
<tr>
<td>Kinsella et al.</td>
<td>52</td>
<td>Memory strategies for day-to-day difficulties</td>
<td>1.5 hrs per week (7.5)</td>
<td>Wait-list</td>
<td>Cognitive measures. Significant difference on two of five measures.</td>
</tr>
<tr>
<td>Jean et al. (2010)</td>
<td>22</td>
<td>Face-name association training paradigms and education on memory</td>
<td>45 minute sessions (4.5)</td>
<td>Errorful learning and memory education</td>
<td>Cognitive measures. No significant differences; some improvements in both groups observed.</td>
</tr>
<tr>
<td>Tsolaki et al.</td>
<td>176</td>
<td>Attention, executive functioning and memory enhancement and strategy training</td>
<td>3 x 90 min sessions per week (90)</td>
<td>Wait-list</td>
<td>Cognitive and daily functioning measures. Significant differences between groups.</td>
</tr>
</tbody>
</table>
5.3 **Strengths and Limitations of the Study**

A major strength of this research is its robust design in the form of a RCT that follows the CONSORT guidelines (303). As previously reviewed, historically, few previous RCTs had explored the benefits of a CFI with a group of older adults with MCI. Whilst the number of published trials has continued to steadily grow, the size of the study populations recruited generally remain small (N<100) and the follow-up periods often do not extend beyond the completion of the intervention (288). Our 24-month follow-up also afforded a substantial period to monitor for cognitive change over time, taking into consideration more traditional review assessments utilised with older adults in both community and clinic settings. A range of outcome measures was used (most are common psychological tests) ensuring diversity of the cognitive, emotional and functional dimensions that could be evaluated. One of the unique features of this research was the application of a fidelity and acceptability assessment. This provided confirmation regarding the consistency in the delivery of the intervention, and its adaptability, together with recognising the perceived impressions of study participants with respect to its quality and applicability.

With respect to identifiable limitations of this research, several issues warrant consideration. It is not uncommon for factors associated with participant recruitment to have implications for hypotheses generated from outcomes. In this research, participants were motivated volunteers with a vested interest in improving their cognition. Hence, our findings require replication and it remains to be seen whether the acceptability of our intervention would be as high in a general community setting. Due to our limited sample size, we also lacked power to investigate “conversion” to dementia. Given the observed
instability and heterogeneity in the MCI population, this remains a highly significant research question. There has been a mixed approach in the research regarding the inclusion of varying presentations of MCI, for example, limiting recruitment to only those participants presenting with amnestic MCI. Focussing on homogenous participant populations may present as a more appealing approach allowing for targeted and specific intervention, delivered in a more saturated manner (e.g. focusing only on memory and functional enhancement in day-to-day scenarios).

The outcome measures chosen may have also influenced the current study findings. For example, it is possible that the measures adopted to rate acceptability of our program were limited in scope and that the number of sessions randomly chosen to be reviewed as part of our fidelity assessment was insufficient. These limitations were driven, to a degree, by economic factors (e.g. time and financial costs). We also did not systematically collect data regarding knowledge and implementation of specific strategies during test-taking (assessment time points), nor did we objectively measure how actively participants were utilising the information they were taught and trained outside of the research environment. As such, it remains uncertain as to what degree (if any) the intervention produced the expected behavioural changes specifically related to cognitive functioning. Additionally, there were no self-report or collateral measures of daily functioning. Unfortunately, it was evident that our practical measure of functional activity was not sensitive to changes due to ceiling effects and it remains unclear whether the intervention had a meaningful impact on instrumental activities of daily living. Functional gains may well have been independent of what was able to be measured on the more traditional administered psychological tests.
Utilising an informant to provide ratings on observed changes in daily activity and well being has been found useful in previous research (e.g.(304)) and may have offered an alternate perspective regarding the value of the PACE intervention. Further, instead of focusing on more traditional, psychometrically based psychological measures, the adoption of goal attainment scaling (GAS) may have allowed for the identification of tangible, outcomes for day-to-day individually focused goals/activities (305). Whilst initially developed to evaluate mental health programs, GAS has been used in a variety of settings to evaluate service delivery and functional outcomes (305).

As mentioned, an additional related issue is that despite the relatively non-specific content of the ‘control’ intervention, it is possible that certain unmeasured behaviours of participants could have affected the cognitive outcomes of people assigned to the educational control group, thereby circumventing any intervention effects. Furthermore, the assessment battery chosen and utilisation of outcome measures is diverse and broad across research designs. The ecological validity of the tests used and the specific relevance to the targeted intervention is often uncertain, unless the participant is directly trained upon the task with which the efficacy of the intervention is being ascertained.
5.4 Directions for Future Research and Conclusions

This research has raised numerous important issues relevant to our ageing community, which have potential implications for policy recommendations regarding health care resources and to facilitate changes in the approach and management of individuals with MCI. Robust research designs with manualised intervention programs that can be readily used in clinic and community settings are needed, as are routine assessments of fidelity and acceptability. Wherever possible, the inclusion of an informant to assist with monitoring behaviour and functional change, together with offering support and reinforcement for engagement in targeted activities, would appear helpful. More accurate and sensitive measures of daily functioning are required in order to accommodate for the potential ceiling effects that can be observed in MCI populations given the relatively intact levels of functional capacity. Addressing the degree to which learnt applications and strategies transfer across settings (i.e. from the research lab to real life scenarios) remains a void in trials of this nature and, possibly, a somewhat challenging aspect of these types of interventions.

In accordance with the findings from the PACE study and similar research trials to date, it would seem somewhat remiss to adopt or promote these forms of interventions as potential preventative or protective approaches against dementia. It is also of interest that, in line with the continued lack of clarity and efficacy regarding treatment approaches for MCI populations, that focus is shifting toward more elaborate and multi-modal strategic approaches (288). Combining cognitive and functional techniques and integrating education on modifiable lifestyle factors into the intervention, appears to have some merit,
particularly given recognition of how diet, management of cardiovascular risk factors and engagement in physically and socially active lifestyles may moderate brain health and well-being (146). Isolation, adjustment to retirement, sleep changes, depression and anxiety are also not uncommon experiences in older adult populations, and may need consideration in a multi-modal approach given the potential for these factors to impede cognition. Indeed, preliminary findings from the Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) are promising, with this large RCT revealing the potential of a multi-domain intervention for improving or maintaining cognition in older at-risk individuals (306). Four intervention components were utilised, in individual and group sessions, covering nutrition, physical exercise training, cognitive training and management of metabolic and vascular risk factors – all potentially modifiable lifestyle factors that have previously been recognised as dementia prevention opportunities (146). Close inspection of the reported outcomes does, however, reveal the potential confounding effects associated with multiple avenues for cognitive enhancement (some of which are already well recognised; e.g. physical activity), adherence to all intervention components and the cost-effectiveness of such programs. Review of the initially reported test outcomes identifies a relatively small difference between the groups at follow-up, and these were mostly due to small improvements in processing speed and executive functioning, but not memory (306). Whilst enhancement in domains other than memory is not necessarily an uncommon finding (e.g. ACTIVE trial (215)), it does have implications with respect to MCI populations and the appropriateness of targeted interventions dependent on the nature of the cognitive impairment (e.g. amnestic MCI; non-amnestic multi-domain MCI).
In an ideal situation, the inclusion of an additional study arm allowing for the monitoring of biological processes (e.g., PIB scanning) of change in tandem with the chosen intervention and use of more traditional outcome measures would have been advantageous. The relatively large scale of these rigorous applications could likely only be achieved across multiple study research sites.

In conclusion, whilst the efficacy of CFI for vulnerable older adult populations seems questionable, there is no evidence that these sorts of interventions cause harm. Participants certainly enjoyed their involvement in the PACE program and considered it worthwhile. Future research is required to address the numerous questions that remain unanswered regarding the place of CFI in preventing dementia.
If I had to live my life again I would have made a rule to read some poetry and listen to some music at least once a week; for perhaps the parts of my brain now atrophied could thus have been kept active through use.

Charles Darwin (from Autobiography, 1887)
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Appendix A: Publications

Appendix B: Ethics Documentation

Appendix C: Test Materials and Questionnaires

Appendix D: Fidelity Assessment Materials
Appendix A: Publications
Cognition-focused interventions for older adults: the state of play

Mandy Vidovich and Osvaldo P. Almeida

Objective: The aim of this study was to review and discuss the evidence supporting the use of cognition-focused interventions to enhance mental function and decrease the risk of dementia.

Method: A non-quantitative review was made of existing evidence supporting the use of cognitive stimulation, rehabilitation and training in enhancing mental function and decreasing the risk of dementia in later life.

Results: Despite growing popularity, there is limited evidence from randomized trials to support the use of cognition-focused interventions to decrease the rate of cognitive decline associated with increasing age or with dementia. There is currently no evidence available from randomized trials to support the use of cognition-focused interventions to prevent dementia.

Conclusions: Sufficiently powered randomized trials of cognition-focused interventions designed to prevent dementia and limit the progression of cognitive decline in later life are needed before these programs are adopted in normal routine clinical practice.

Key words: cognitive stimulation, cognitive training, dementia, mental activity, rehabilitation.

In 1999 Dr William Sunderman was still working from 8 a.m. to 4 p.m. editing a medical journal at the Institute for Clinical Science at Pennsylvania Hospital in Philadelphia. He was a man of much energy and many talents – a poet, a scientist, a leader who worked to improve the standard of pathology practice, and a violinist good enough to play at Carnegie Hall. Perhaps the most striking thing about him was that in 1999, while working his 40 hour week, he was 100 years old.

Few will be unfamiliar with the adage “use it or lose it”, and cases such as Dr Sunderman’s add credence to the belief that regular engagement in mental activity or intellectual stimulation assists in the maintenance of cognition. Animal, 1–3 neuroimaging 4,5 and observational studies have consistently identified an association between enriched environments, enhanced cognition and reduced risk of dementia in later life. 6–8 Whilst such findings are generally consistent, causal links have not been firmly established, in part reflecting uncertainty regarding the pathological processes, the interplay between environment, lifestyle and genetic factors, and the degree to which cognitive benefits are ameliorated by time-points of activity across the lifespan.

MENTAL ACTIVITY AND COGNITION-FOCUSED INTERVENTIONS

Life experience (educational and occupational factors) and leisure pursuits (e.g. mah-jong, reading, learning a language) are examples of mental activity.
In contrast to the day-to-day types of stimulation that people engage in when awake, are cognition-focused interventions. Typically grouped into one of three categories – cognitive stimulation, cognitive rehabilitation and cognitive training – the terms, as well as the nature of the activities, are often used interchangeably in the literature.

Cognitive stimulation

Cognitive stimulation (CS) emphasizes the benefits of group activities that, dependent on the target population and objectives, can range from education, discussion and debate, and problem solving, to reality-orientation, reminiscence and validation therapy. Adopted in 2006 as part of the National Institute for Health and Clinical Excellence (NICE) guidelines, CS therapy has been recommended as the treatment of choice for individuals in the early stages of dementia (Mini Mental State Examination – MMSE, score ≥ 20). Improved cognitive performances and quality of life scores have been reported in people with dementia who undergo CS, and research into the cost-effectiveness of this type of intervention has also been undertaken. Despite favourable indications, few randomized trials of CS have been published to date and the research regarding the use of this type of intervention for cognitively healthy older adults at risk for dementia is also extremely limited. Further, the relationship between the activities and expected results across outcome measures is not clearly defined. This appears to reflect the lack of grounding of the intervention in theoretical models of neuropsychology and the limitations associated with activities not being tailored to meet personal needs. There is also some uncertainty about the trial that was used to support the introduction of the NICE guidelines, as that study may have inadvertently reported as improvement what seems to have been a deterioration of scores on the Alzheimer’s disease assessment scale, cognitive subscale (ADAS-cog) (increasing ADAS-cog scores indicate deteriorating cognitive function). Table 2 of the manuscript by Spector et al. shows that the ADAS-cog scores of participants in the intervention group increased 1.9 points (standard deviation (SD) = 6.2), whereas in the control group they declined 0.3 points (SD = 5.5). In the text, the authors reported that at “follow-up, the treatment group had significantly higher scores on the MMSE and ADAS-cog.” This seems to suggest that either the interpretation or the reporting of these data was incorrect.

Cognitive rehabilitation

Cognitive rehabilitation (CR) focuses on the identified needs of the individual, with consideration given to specific areas of impairment, and an emphasis on improving everyday skills. It aims to optimize functioning and wellbeing, minimize disability and enhance the individual’s self-efficacy and coping skills. Goals are often considered in light of the level of cognitive impairment, and outcome measures are chosen to specifically capture the rehabilitation focus. Individuals with dementia seem to benefit from this form of intervention, with numerous case-studies suggesting that the use of techniques such as spaced retrieval and vanishing cues, improves learning of names, reduces repetitive behaviours and enhances certain aspects of function. CR results are encouraging, although data from sufficiently powered randomized trials are still lacking. In addition, the success of CR is influenced by factors such as motivation, practice, program duration, third party involvement (e.g. family member, carer) and the ability of the intervention to adapt to the changing needs of the individual.

Cognitive training

Cognitive training (CT) involves a set of standardized, repeatedly performed tasks, designed to enhance or, at a minimum, maintain a particular set of cognitive functions. CT interventions have been employed with a range of participant populations, utilizing various techniques and applications (e.g. individualized versus group; pencil/paper versus computer). One of the largest and most frequently cited studies with healthy older adults is the Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE) trial, which recruited 2832 community dwelling individuals aged 65 to 94 years. In this randomized controlled trial (RCT), participants were trained in one of three different interventions: memory, processing speed, and reasoning. Whilst participants improved their performance on trained tasks, the effects of the intervention failed to generalize beyond the trained domain. Cognitive improvements dissipated over time, though some gain was still detectable five years later. Despite the reasoning group reporting significantly less difficulty in undertaking instrumental activities of daily living than the control group at the long term follow up, there continued to be no demonstrable effects on outcome measures assessing functional capacity. It is not surprising that healthy older adults have the capacity to improve performance with CT, and this has been demonstrated in other trials measuring speed of information processing, memory and executive functions. Even older adults with mild cognitive impairment (MCI) show gains upon trained tasks. The main criticisms of this type of intervention are that these programs do not necessarily focus on the needs of the individual, and gains made by participants tend to be task-specific, with little transfer of training to other domains. A recent challenge to this assumption has come from Ball et al. who reviewed sets of data collected from the ACTIVE trial and studied the effects of CT on subsequent motor vehicle collisions (MVC) in older drivers. They concluded that those participants who had undergone speed of processing and reasoning training were involved in a lower number of at fault MVC than controls over a six year period, suggesting a possible role for CT in enhancing driver safety.
DISCUSSION

Currently, available evidence in support of the use of CS, CR and CT to prevent cognitive decline in later life is scant. CS therapy may have the potential to enhance cognition and wellbeing in older adults with dementia, yet long-term maintenance effects remain uncertain. CR techniques are well established and can be used to improve cognition in discrete areas, though the cost effectiveness and access to suitably trained therapists creates limitations with respect to the availability of resources and their usefulness in improving function. CT programs improve performance on trained tasks (with potential long-term maintenance of gains) though the transfer of effects to other day-to-day activities appears limited. In instances where gains have translated into improved performance in everyday life, the underlying component of the trained tasks tends to closely mimic the cognitive skill set utilized in performance.

Despite persuasive evidence that cognition may be enhanced with specific interventions, there is not yet a definitive answer as to whether engaging older adults in these forms of activities provides a protective mechanism or “buffer” against cognitive decline, particularly in domains other than those that have been trained. It also remains to be seen whether the use of cognition-focused interventions in vulnerable populations (e.g. those with MCI) can reduce the risk of dementia, or if the application of these types of strategies can slow down the trajectory of the disease process. Difficulties in establishing the benefits of engaging in cognition-focused interventions has been compounded by differences in study methodology and participant populations, varied intervention techniques implemented across diverse time frames, and the adoption of a broad number of outcome measures (or lack thereof in some instances). These factors have limited the application of meta-analytic techniques when systematically reviewing the literature, with subsequent varied conclusions regarding the potential of cognition-focused interventions for reducing cognitive decline and the risk of dementia. 25-27

What does this all mean for consumers? Australia has yet to adopt “brain fitness programs” as standard practice in residential facilities, yet this burgeoning and unregulated million dollar industry continues to expand, fuelled by media interest in brain health and consumer concern regarding memory loss and dementia. An article published online in the journal Nature generated considerable debate regarding the merits of commercially available brain training programs. The authors conducted a six-week online study, in which participants trained several times each week, in their own home, on tasks designed to improve reasoning, memory, planning, visuo-spatial skills and attention. Improvements in performances were limited to the cognitive tasks upon which the individual was trained, with no reported evidence for transfer effects to untrained tasks. Whilst this has been used as evidence of a lack of empirical support regarding the benefits of these programs in the broader population, the study has drawn criticisms with respect to its methodology, with high dropout rates of participants and the use of questionable outcome measures. 30,31

There is currently no cure and no definitive way of preventing Alzheimer’s disease, although some interventions seem potentially promising. 32-33 As the market for computerized “brain boosting” programs explodes and vulnerable consumers expend time and finances on commercial products that may provide limited benefit, clinicians find themselves in uncertain territory concerning how best to advise their patients. “Prescriptive” information regarding what to do remains elusive. Older adults (cognitively intact or otherwise) should be encouraged to engage in regular stimulating activities that are moderately challenging, motivating and interesting. What is best for the individual might only be appropriately determined by baseline neuropsychological assessments, identifying strengths and weaknesses, and the implementation of a personalized regime targeting fragile cognitive domains. Including carers/companions in the rehabilitation and training process to ensure ongoing and regular implementation of learnt strategies may also be necessary, and combining both individualized home programs with the social components of group environments may further optimize cognitive enrichment, particularly with respect to influencing mood and wellbeing.

A “one type fits all” approach may well be unsatisfactory and part of the underlying reason as to why, after years of research, there is still no compelling evidence to support the systematic use of CS, CR and CT in clinical practice. Nevertheless, lack of evidence is not the same as evidence of lack of an effect. We continue to wait with anticipation for the results of sufficiently powered randomized trials of cognition-focused interventions designed to prevent dementia and limit the progression of cognitive decline in later life.

DISCLOSURE

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REFERENCES


Study protocol

The PACE Study: A randomised clinical trial of cognitive activity (CA) for older adults with mild cognitive impairment (MCI)

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Abstract

Background: Research evidence from observational studies suggests that cognitive activity reduces the risk of cognitive impairment in later life as well as the rate of cognitive decline of people with dementia. The Promoting Healthy Ageing with Cognitive Exercise (PACE) study has been designed to determine whether a cognitive activity intervention decreases the rate of cognitive decline amongst older adults with mild cognitive impairment (MCI).

Methods/Design: The study will recruit 160 community-dwelling men and women aged 65 years of age or over with mild cognitive impairment (MCI). Participants will be randomly allocated to two treatment groups: non-specific education and cognitive activity. The intervention will consist of ten 90-minute sessions delivered twice per week over a period of five weeks. The primary outcome measure of the study is the change from baseline in the total score on the Cambridge Cognitive Score (CAMCOG). Secondary outcomes of interest include changes in memory, attention, executive functions, mood and quality of life. Primary endpoints will be collected 12, 52 and 104 weeks after the baseline assessment.

Discussion: The proposed project will produce the best available evidence on the merits of increased cognitive activity as a strategy to prevent cognitive decline among older adults with MCI. We anticipate that the results of this study will have implications for the development of evidence-based preventive strategies to reduce the rate of cognitive decline amongst older people at risk of dementia.

Trial registration: ACTRN12608000556347

Background

The World's population is ageing rapidly and so is the frequency of age-related disorders. Dementia is one of the most frequent mental health disorders of older people and a leading cause of years of life lost due to disability [1]. Mild Cognitive Impairment (MCI) in old age is con-
sidered an important clinical state potentially predictive of future cognitive decline. The term MCI has been used to describe a heterogeneous group of older adults, who, whilst not fulfilling diagnostic criteria for dementia, demonstrate cognitive abilities at a level below what is considered normal for their age. Cognitive deficits may be apparent across unitary or multiple domains though the person continues to maintain a high level of functional independence [2]. Whilst this diagnostic group is at increased risk for conversion to dementia, a substantial number of individuals remain stable or even return to normal levels of functioning with time [3].

There is increasing evidence that the onset of dementia can be delayed by targeting relevant risk factors. In older adults, frequent participation in mentally stimulating leisure activities has been associated with stronger cognitive abilities (such as memory) and reduced risk of dementia [4,5]. The idea that mentally stimulating activity can influence cognitive processes is akin to the "use it or lose it" adage [6]. Few randomised controlled studies have explored this notion and critical evaluation of the research on this topic reveals a number of methodological limitations. These include the specific nature of some of the participant cohorts, the tests used to measure cognitive functioning, and the complexity associated with identifying and defining a broad range of leisure activities with regard to type and degree of cognitive stimulation (see [6] for a review).

Cognition-focused interventions (cognitive training, cognitive rehabilitation and cognitive stimulation) attempt to make use of intact domains to help maintain cognition and prevent/delay decline. These techniques have also been employed to increase functional independence and reduce caregiver burden (see [7] for a review).

Similar to mentally stimulating leisure activities, cognitive stimulation (CS) is a type of intervention that emphasises the benefits of group activities focussing on education, discussion and debate, and problem solving. In contrast, cognitive rehabilitation (CR) can be tailored towards an individual's needs, with consideration given to specific areas of impairment and an emphasis on improving everyday functioning. Another commonly used strategy is cognitive training (CT), which aims to provide the individual with a set of standardised tasks that they repeatedly perform. CT using specifically designed computer programs has become a burgeoning business and is generating increasing scientific interest.

Collectively, the research in this area has revealed that older adults (with and without dementia) show modest gains across areas related to the target intervention, and improvements on subjective measures assessing aspects of mood and quality of life have also been observed [8]. However, there is a paucity of randomised controlled trials in this area, limiting conclusions that can be drawn from existing data.

We have designed a single-blind, randomised controlled trial of an intervention that draws on methods of cognition-focussed approaches, selected with regard to suitability for older adults with MCI, and combined into a package considered interesting, engaging and acceptable to this group. The primary focus of this research is to determine whether a structured program of cognitive activity (CA) can decrease the rate of cognitive decline amongst older adults with MCI over 24 months. We hypothesize that participants allocated to the CA group will experience less cognitive decline than older adults randomised to a control education intervention.

**Methods/Design**

**Background**

The Promoting Healthy Ageing with Cognitive Exercise (PACE) study is a randomised controlled trial that commenced recruitment of participants in March 2007.

In late 2006, eight individuals with MCI, aged 60 years and over, were invited to offer their opinions regarding the development of a program of cognitive activity (CA), specifically designed for older adults with cognitive decline. The group confirmed the merit of such research and provided feedback with respect to the elements needed to be incorporated into the designed intervention. The general consensus was that any CA program needed to be challenging, personally stimulating and to have a social component.

In February 2007, the CA and educational interventions forming the basis of the PACE study were piloted with 10 participants (five allocated to each intervention), aged 65 and over with MCI. These individuals attended on a daily basis over a two week period and were asked to provide written feedback regarding the session material. The proposed interventions were well received, with positive feedback regarding the relevance of the content/material, format and delivery style. The education group described the program as "useful" and "informative" and the CA group, "encouraging" and "practically helpful". After collating the feedback, additional, minor modifications were made to the study protocol and recruitment began.

**Participants**

**Recruitment of older persons**

Participants were community dwelling volunteers recruited from various sources such as memory clinics, local media and other ongoing research studies. Potential participants were initially screened with a semi-structured
Volunteers were initially screened via a telephone interview to ascertain individuals’ concerns regarding their memory. Those indicating that they had received a diagnosis of dementia were immediately excluded. The remainder were then asked about general health - both past and current concerns - as well as education and English literacy skills. Details regarding current alcohol consumption were also collected and all potential participants completed the PHQ-9 (see below) and the TICS-M (see below). Telephone interviews took approximately 10 to 30 minutes to complete depending on the extent of information needed to address inclusion and exclusion criteria. Those meeting provisional criteria for inclusion were invited to a face-to-face assessment at the WACHA to confirm that they fulfilled the study criteria.

**Patient Health Questionnaire - Nine Item (PHQ-9)** [11]

The PHQ-9 is the depression module taken from the full PHQ [12], an instrument used to make criteria-based diagnoses of depressive and other mental disorders according to the DSM-IV. In this study it was used to initially exclude individuals with depression and then to monitor the presence of depressive symptoms at follow up. Scores range from 0 to 27, with scores of 15 or greater indicative of clinically significant depression. Volunteers with a score of 15 or more on the PHQ-9 were excluded from further participation in the study.

**Clinical Screen**

Three-hundred and twenty-four older adults completed the face-to-face assessment to establish the diagnosis of MCI according to the following criteria [2]

- Cognitive complaints and reports of decline from the individual
- Cognitive disorder as evidenced by clinical evaluation (impairment in memory and/or in another cognitive domain)
- Absence of major repercussions on daily life (the individual may however report difficulties concerning complex day to day activities)
- Absence of dementia

Cognitive disorder was established by identifying performances 1.5 standard deviations below the age and sex norms on any Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) cognitive task [14]. The CERAD is composed of sub-tests assessing language, memory and praxis and is considered a valid and reliable measure of cognitive function, as well as MCI and Alzheimer’s disease [15]. Embedded within this test battery is the MMSE. This brief cognitive test is a commonly used screening instrument that produces a total score that can range from 0 to 30. Scores lower than 24 are reliably associated with the diagnosis of dementia or other organic mental disorders. The present study also used the MMSE to exclude participants with more severe cognitive impairment than MCI.

In addition to the cognitive screen, participants were required to score less than 16 on the World Health Organ-
A self-reported medical history questionnaire was also completed by the participants and details collected regarding their medication use. A screen of participants' ability to manage complex activities of daily living was conducted using a modified version of the Structured Assessment of Independent Living Skills (SAILS [17]). Information regarding the participant's motor skills (fine and gross), language abilities and capacity to carry out tasks similar to day to day activities (e.g. money related skills, following a recipe, reading a calendar) were collected. A score of 150 represented a perfect score and those individuals with scores of less than 141, suggestive of difficulties carrying out instrumental activities of daily living, were excluded.

The screening assessment at the WACHA took approximately 30 to 40 minutes to complete. Any pertinent clinically information was reported to the relevant treating physician with the consent of the study participant. Of those who were screened, 171 met criteria and 160 completed written informed consent to participate.

**Outcome Measures and Assessment Procedures**

**Baseline Assessment**

Baseline assessments were completed within three months of inclusion in the study, approximately two weeks prior to the first intervention session and prior to randomisation. Baseline and post intervention assessments took between 60 to 90 minutes to complete (including the provision of short breaks), with a two hour session allocated for the more detailed 12 and 24 month follow ups. The assessments comprised a series of tests and questionnaires, and included the following:

**Primary outcome measure**

Cambridge Cognitive Screen (CAMCOG): This is the brief neuropsychological battery of the Cambridge Examination for Mental Disorders of the Elderly - Revised (CAM-DEX-R) [18] that includes a range of objective cognitive tests. It provides sub-scale scores for a number of cognitive domains as well as a global score out of 105. It takes approximately 30 minutes to administer and is very effective at differentiating between people with and without dementia [19]. There is also evidence that CAMCOG scores are sensitive to change over time [20]. The CAMCOG is the primary outcome measure of this study.

**Secondary Outcome Measures**

California Verbal Learning Test-Second Edition (Standard and Alternate Forms) (CVLT-II) [21]: This is a 16-item word list task that measures verbal learning and memory. It yields scores on immediate and delayed recall as well as recognition. Provision of standard and alternate forms minimises practice effects and are being used to monitor change in memory functions. The CVLT-II was chosen as a secondary outcome measure because low scores on word list learning tasks are associated with progression to dementia [22].

The Symbol Search sub-test from the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III) [23] comprises forward and backward span components assessing individuals' auditory immediate attention and working memory. The examinee listens to a series of digits given orally by the examiner and then repeats the digits either in a forward or reverse sequence. Testing is discontinued after failure on the two trials of any series.

The Digit Span sub-test from the WAIS-III [23] comprises forward and backward span components assessing individuals' auditory immediate attention and working memory. In Part A the participant draws lines to connect consecutively numbered circles. Part B requires the participant to connect a sequence of numbered and lettered circles, alternating between the two sequences. The tests are timed, with participants instructed to complete the sequencing as quickly as possible.

The Trail Making Test (TMT) [25] has two parts and measures complex visual scanning, motor speed and mental agility. In Part A the participant draws lines to connect consecutively numbered circles. Part B requires the participant to connect a sequence of numbered and lettered circles, alternating between the two sequences. The tests are timed, with participants instructed to complete the sequencing as quickly as possible.

The Controlled Word Association Test (COWAT) [25] consists of three word naming trials, with the letters FAS employed. Participants are asked to say as many words as they can think of that begin with the given letter of the alphabet, excluding proper nouns, numbers and the same word with a different suffix. A minute is given for each letter trial and performance is used as an indicator of executive functioning.

PHQ-9: We used the PHQ-9 total score, as previously described, to monitor changes in mood throughout the trial.
Leisure Activity and Frequency Questionnaire [4]: This seven-item questionnaire assesses the frequency of participation in a variety of mentally stimulating leisure activities. Given the relationship identified between leisure activity and cognitive decline [24], the aforementioned questionnaire was chosen to identify the effects that the individual’s level of activity over the course of the study may have on their rate of cognitive decline.

Participants also rated their level of engagement in physical activity [26]. They were asked to indicate how much time they spent, over a week, taking part in vigorous and non-vigorous activity. An additional questionnaire was also added to identify the nature and quality of the participants' social relationships [27].

The Memory Functioning Questionnaire (MFQ) [28]: The MFQ is a 64-item questionnaire evaluating self-perception of everyday memory functioning. It was used at baseline and across follow-up assessments to determine the influence of the intervention on perceived level of memory ability.

The Quality of Life in Alzheimer's Disease (QoL-AD) [29]: This is a 13-item questionnaire completed by the participant assessing their perception of their quality of life across a number of different domains.

Participants were also asked to provide specific details regarding their educational and occupational background.

The assessment battery described above was repeated immediately after the intervention (please see details below) and again after 12 and 24 months (please see table 1). The 12 and 24 month follow-up assessments were undertaken relative to the baseline testing and also included the additional measures administered at the “Clinic Screen”.

Biological Sample and DNA Collection
We also asked participants to donate a blood or saliva sample to determine the influence of common biochemical (e.g., high plasma homocysteine) and genetic factors (e.g., apolipoprotein E4 genotype) on participants' response to the intervention. The samples are being collected and processed by the Department of Clinical Pathology and Biochemistry at the RPH where they are currently stored at -80°C. All material has been batched and will only be processed at the end of the trial.

Intervention
The interventions (both CA and education) consisted of a five-week group activity run by a qualified Neuropsychologist at the WACHA. The CA and control education groups were exposed to the same length of intervention, social interaction and contact with the program coordinator. Both the CA and educational intervention were manualised and delivered in a structured way, and all sessions (220) were audio-taped for subsequent fidelity assessment. Forty four of these sessions were randomly selected and transcribed. An independent rater used a specially devised scale to evaluate session content for consistency of concepts and issues raised across sessions according to a pre-defined criteria.

Research assistants (RAs) blinded to group allocation conducted all assessments. RAs were provided with strict instructions to avoid any potential opportunity for disclosure regarding intervention participation. The intention is that RAs undertaking data collection will be asked to guess the group membership of participants at the end of the study. This will be done to determine the effectiveness of the blinding procedures that were put in place for this project. A brief summary of each intervention is provided below.

CA Group
Each group consisted of 6-9 participants who took part in 90-minute sessions twice a week for five weeks (10 sessions in total). Session One introduced the nature of the program and developed familiarity within the group, with personal introductions and sharing of background information/experiences. Sessions Two and Three focused on the cognitive domains of attention, processing speed and executive functions, how these domains change as people age and the influence they have on memory abilities. Participants were advised about strategies to manage cognitive decline associated with these domains, including a number of practical exercises. Sessions Four to Seven primarily focused on memory, with the aim of defining the processes involved in learning and retaining new information. These sessions provided participants with strategies and techniques to manage memory dysfunction. There was regular opportunity for supervised practice of such techniques in all sessions. Session Eight reviewed age associated language difficulties and aimed to provide participants with ways to manage word finding difficulties, as well as affording opportunity for undertaking language-based exercise activities. Sessions Nine to Ten were used to practice and review the previously presented material and recommended strategies, and to discuss any difficulties managing the strategies/techniques previously presented.

As part of the intervention, all participants received a folder containing the slides of each session, and copies of all completed activities.

Education Group
Each educational group consisted of 6 to 9 participants who took part in 90-minute sessions twice a week for five weeks (10 sessions in total). Session One followed the
same format described for the CA group. Session Two covered the topic of memory functioning and dementia, aiming to provide a broad overview of how these issues can affect older people. Session Three reviewed the health benefits associated with physical activity and ways to incorporate physical activity into daily lifestyle. Sessions Four and Five were devoted to defining stress and depression as well as reviewing the cause, effects and management of these conditions. Session Six outlined changes in sleep associated with ageing and the management of sleep disturbance. In sessions Seven to Nine, focus was placed on issues of retirement including expectations, lifestyle changes, volunteer activities, cultural/societal implications of ageing and travelling. Session Ten reviewed the content of material covered in the previous weeks and provided opportunity for discussion of any questions/issues arising from the presented topics. In contrast to the CA group, there was no emphasis on skill development or

Table 1: Outline of the assessments and timelines of the PACE trial.

<table>
<thead>
<tr>
<th>Assessment Tool</th>
<th>Telephone Screen</th>
<th>Clinical Screen</th>
<th>Baseline (0 weeks)</th>
<th>Post-Intervention (12 weeks)</th>
<th>12 months (52 weeks)</th>
<th>24 months (104 weeks)</th>
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<tbody>
<tr>
<td>TICS-M</td>
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The X indicates at which point of the trial the respective assessments took place. Follow-up times relate to baseline testing.
A booster telephone call took place at 24 weeks, with a face to face booster at 52 weeks.
TICS-M = The Modified Telephone Interview for Cognitive Status; PHQ-9 = Patient Health Questionnaire - Nine Item; CERAD = Consortium to Establish a Registry for Alzheimer’s Disease; MMSE = Mini Mental State Examination; AUDIT = Alcohol Use Disorders Identification Test; SAILS = Structured Assessment of Independent Living Skills; MHQ = Medical Health Questionnaire; CAMCOG = Cambridge Cognitive Examination; CVLT-II = California Verbal Learning Test - Second Edition; TMT = Trail Making Tests; COWAT = Controlled Oral Word Association Test; LAQ = Leisure Activity Questionnaire; PAQ = Physical Activity Questionnaire; SNSQ = Social Network Satisfaction Questionnaire; MFQ = Memory Functioning Questionnaire; QOL-AD = Quality of Life in Alzheimer’s Disease.
the promotion of mentally stimulating activities and sessions had a greater level of mental passivity. However, as in the CA group, there was opportunity for group discussion and interaction and participants were provided with a folder containing the slides of each session.

**Booster Sessions**

All participants received a fifteen-minute "booster" telephone call six months after the baseline assessment to review and discuss the topics presented at the group sessions. Thirty minutes of additional exercise material was posted to participants in the CA group for completion prior to the booster call and served as the basis for discussion during the telephone contact. After the 12-month assessment a face-to-face group 1-hour booster session was offered to both intervention groups. This session was used to review the practical aspects of the CA and educational programs.

**Randomisation**

After the baseline assessment, participants were randomly allocated to either the CA or control education interventions according to a random list of numbers generated by computer. Randomisation was undertaken in random blocks of 12 to 18, with six to nine individuals allocated to each group. The allocation list was handled by an independent investigator (OPA) who had no contact with study participants and was not involved in the supervision of staff responsible for the collection of data. The allocation table was then passed on to the investigator running the intervention (MV), who invited eligible participants to join the relevant groups. Research assistants undertaking the follow-up assessments remained blinded to group allocation.

**Sample Size and Power Calculation**

At present there is no reliable data for calculating the sample size of the proposed trial. Currently available data suggests that older people living in the community lose 1.6 points per year on the CAMCOG [30]. Factoring in a possible 20% loss to follow up, with 64 people in each group we will have 80% power to detect a between-groups difference of 1.5 points on the CAMCOG. This assumes a decline that is twice as large in the educational compared with the cognitive intervention group, and although statistically this may be associated with moderate effect size (0.5), it is the minimum difference that one would consider clinically significant.

**Analysis of the Data**

Changes in the CAMCOG score from baseline are the primary outcome of interest in the study. We will model these changes at 3 time points: 12 weeks (immediately after the intervention comes to an end), 52 and 104 weeks. We will use mixed effects models to analyse the data. This approach will enable us to take into account the cognitive performance of participants at baseline, as well as the intra-person correlation generated from repeated measures. Intention-to-treat analyses will be based on the use of imputation by chain equations (ICE), which will precede the use of the mixed-effects model.

We accept that participation in the cognitively non-specific educational intervention is likely to have an effect on the performance of participants. However, to ensure continued participation of the control group we deemed it crucial to provide some form of intervention or potentially face differential drop out, with the control group participants withdrawing because of lack of engagement in the study. We will model changes over time for both groups and this will enable us to determine the effect of both interventions (as well as the sustainability of this effect over 24 months) on cognitive performance.

**Comment**

Our group has previously demonstrated that it is possible to delay cognitive decline in people with MCI by means of a physical activity program [31]. Observational data and basic research suggest that cognitive activity is also associated with decreased risk of cognitive impairment, though there is limited empirical evidence from randomised trials that cognitive activity can delay the progression of cognitive decline in people with MCI who are at increased risk of developing dementia. This trial has been designed according to CONSORT guidelines and has been structured to enable its reproduction in both research and clinical settings. We expect to collect the final endpoint by December 2010 and anticipate that the results of this study will have implications for the development of evidence-based preventive strategies to reduce the rate of cognitive decline amongst older people at risk of dementia.

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ contributions**

All authors are members of the PACE project group and participated in the conceptualisation and implementation of the study. MV acts as guarantor of the data and has been responsible for the day-to-day supervision of research staff and delivery of the interventions. All investigators have contributed to design the study and to obtain funding. MV and OA have drafted this manuscript, which has been critically reviewed by NL, LC and LF. All authors have approved the submission of the present paper to Trials.

**Acknowledgements**

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References


ABSTRACT

Background: Acceptability and fidelity assessments are an integral part of research, although few published trials comment on these processes in detail.

Methods: We designed a randomized controlled trial (RCT) to identify the benefits of a cognition-focused intervention for older adults with mild cognitive impairment. Participants completed a six-item feedback questionnaire identifying level of satisfaction with their allocated intervention; this formed the acceptability assessment. Audio recordings of all sessions were reviewed and systematically assessed and rated for consistency of delivery (fidelity assessment).

Results: Mean attendance (standard deviation) was 8.1 sessions (2.8) for the cognitive activity (CA) group and 8.4 (2.6) for the control general education group. There were no differences between groups regarding clarity and interest, willingness to attend the program in the community and pay a fee. Both groups reported the interventions to be relevant to their needs; however, this was rated more highly by the CA group (p < 0.01). There was high adherence to delivery of program content across both groups, yielding consistency scores above 95%.

Conclusion: This study illustrates a systematic approach to assess acceptability and fidelity. The results show that the intervention was well received and met the needs of all participants. The manualized structure of the sessions facilitated the systematic implementation and reproducibility of the interventions. Acceptability and fidelity assessments have implications for the validity of assumptions made regarding trial outcomes and should therefore be included as standard process in RCTs.

Key words: acceptability, fidelity, cognitive activity, mild cognitive impairment

Introduction

Identifying how well a behavioral intervention is received by the intended target population and the degree to which it adheres to a set protocol can have significant implications for translation of the program into clinical practice and to determine the validity of the findings. These two processes, commonly labeled “acceptability” and “treatment fidelity,” should routinely be adopted as due process in the early stages of planning in health behavior interventions and programs.

The acceptability of an intervention can be influenced by several factors, including the specific nature of the treatment (e.g. opportunity for personal gain), the complexity of the intervention, and the format of the delivery of the specific treatment (Cowan and Sheridan, 2003). Subjective evaluation measures, such as the use of self-report questionnaires, are frequently adopted to identify consumer ratings regarding the appropriateness, effectiveness, and fairness of the intervention, which are characteristics that exemplify acceptability (Finn and Sladecek, 2001). Consumer satisfaction plays a particularly important role in determining whether the intervention or treatment procedures are likely...
to be adopted, implemented, and maintained, beyond the setting in which it was delivered.

Treatment fidelity can be defined as the methodological strategies and practices used to address the reliability and validity of research interventions (Bellg et al., 2004). It aims to determine if the treatment was delivered as intended and the extent to which newly learnt skills are applied to daily life (Lichstein et al., 1994). Treatment fidelity becomes important when determining the degree to which the effectiveness (or lack thereof) of an intervention may have been influenced by other factors, and has implications for the degree of confidence placed upon proposed mechanisms for observed change (Lichstein et al., 1994). This becomes a particularly salient issue for interventions delivered by different instructors across varied time points within a trial.

Despite the potential implications for the interpretation of study outcomes, the reporting of acceptability and treatment fidelity has not been consistent (Bellg et al., 2004). For example, Dane and Schneider (1998) reviewed the degree to which consideration was given to fidelity assessments in a series of primary and early secondary prevention programs. They established a set of criteria against which studies were assessed, focusing specifically on aspects of program integrity, rating fidelity according to adherence, exposure, quality of delivery, participant responsiveness, and program differentiation (Dane and Schneider, 1998). They found that less than a third of the 162 outcome studies addressed the issue of fidelity.

The Promoting Healthy Ageing with Cognitive Exercise (PACE) study was designed to determine whether a cognitive activity intervention could decrease the rate of cognitive decline amongst older adults with mild cognitive impairment (MCI). The aim of identifying the acceptability of the program was to investigate consumer satisfaction with the interventions and to determine how the target population rated the program components. They were also asked to rate the relevance of the program to their perceived needs and whether the intervention was something in which they would be willing to participate in their community.

The aim of the fidelity assessment was to ensure consistency in delivery of the content of the intervention. In accordance with the criteria utilized by Dane and Schneider (1998), attention was also paid to exposure, participant responsiveness, and program differentiation.

**Methods**

**Participants, randomization, and blinding**

Detailed information regarding the participants, the training program, the experimental design, and the outcome measures of the PACE study has been published elsewhere (Vidovich et al., 2009). In brief, 160 adults were deemed eligible to participate in the trial, based on the following inclusion criteria – a diagnosis of MCI (according to Portet et al., 2006, criteria), aged 65 years or older, able to travel to the research center, and proficient in spoken and written English. Individuals with a diagnosis of dementia according to International Classification of Diseases 10th Revision (ICD-10) criteria for research (WHO, 2007) or suffering notable cognitive impairment, as evidenced by a Mini Mental State Examination (MMSE; Folstein et al., 1975) score of 23 or less, were excluded from the study. Additional exclusion criteria included current psychiatric disorder, current hazardous or harmful alcohol consumption (based on Saunders et al., 1993), and current medical condition that prevented participation in the study tasks (such as sensory impairment) or was associated with reduced survival over a 12-month period (e.g. advanced cancer). Individuals who reported a clinical history of stroke associated with permanent disability were also excluded. A baseline neuropsychological assessment was conducted prior to randomization into either a five-week cognitive activity (CA) program or a control general education (GE) program. Randomization was undertaken in blocks of 12–18, according to a random list of numbers generated by computer, with six to nine individuals allocated to each group. Due to the nature of the intervention, participants were not blinded to group membership; however, research assistants undertaking the follow-up assessments were. All assessments and the program interventions were undertaken at the Western Australia Centre for Health and Ageing at Royal Perth Hospital.

This project was conducted in accordance with the Helsinki Declaration for Human Rights. The ethics committee of the Royal Perth Hospital approved the study protocol and all participants offered written informed consent.

**Intervention**

During the early stages of conceptualization of the trial, eight individuals with MCI, aged 60 years and older, were invited to participate in a one-hour focus group. Their opinions were sought regarding the development of a program of CA specifically designed for older adults concerned about cognitive decline. The consistent opinion of the group was that any CA program needed to be challenging and personally stimulating and to have a social component. Two program interventions were then manualized comprising the CA and GE arms. The content of the manuals incorporated known information regarding age-associated cognitive
decline and strategies to manage difficulties, as well as addressing health issues relevant to older adult populations. These programs were piloted with a group of ten older adults with MCI and served as the basis for the design and implementation of the intervention, which is described below.

Study participants were asked to attend ten 90-minute sessions over a five-week period. The group randomly assigned to CA received information about age-associated cognitive changes and ways to manage common difficulties, as well as completing pencil and paper activities to illustrate strategies for enhancing attentional capacity, memory functions, and executive processes. Details about the intervention have been described elsewhere (Vidovich et al., 2009). In contrast, participants randomly assigned to the GE program took part in a series of presentations about healthy aging, including the impact of lifestyle factors, with sessions comprising videos and group discussion (please see Vidovich et al., 2009, for further details). A clinical neuropsychologist (MRV) ran all groups, exposing participants to the same instructor, time and group (e.g. 1–11) numbers, excluding sessions one and ten, generated by computer. Session one was excluded as it was considered an introductory session which reviewed the nature of the trial and program material to be covered, and allowed for participants to informally get to know each other. As session ten was used as a revision session and no new material was presented, it was also excluded. An excel spreadsheet was used to identify a random list of numbers generated by computer, with a total of 44 sessions (i.e. 22 from each arm) randomly selected and transcribed by research assistants.

Study measures
Study participants who attended the final session of their five-week group program were asked to complete a brief questionnaire (see Box 1), rating the acceptability of the program. These questionnaires were completed anonymously within the group environment whilst the instructor was out of the room and the data were collated and entered into an excel spreadsheet by an independent research assistant.

Eleven GE and 11 CA groups were conducted over the course of the study resulting in a total of 110 presentations under each condition. The content of each session was digitally recorded and following each session, the voice recordings were downloaded onto a PC. An excel spreadsheet was used to identify a random list of session (e.g. 2–9) and group (e.g. 1–11) numbers, excluding sessions one and ten, generated by computer. Session one was excluded as it was considered an introductory session which reviewed the nature of the trial and program material to be covered, and allowed for participants to informally get to know each other. As session ten was used as a revision session and no new material was presented, it was also excluded. An excel spreadsheet was used to identify a random list of numbers generated by computer, with a total of 44 sessions (i.e. 22 from each arm) randomly selected and transcribed by research assistants.

A template was devised that identified the individual content components of each session, against which ratings were later made to determine whether material contained in the instructor program manual had been presented. The amount of content and topic structure to be reviewed varied across each session. Topics which were rated and the amount of item content within each topic are shown in Table 1. A rating key was devised to indicate the degree to which the topic was covered and numerical ratings were applied.

A research assistant, who was not involved in the transcribing process and did not have any contact with participants, listened to the transcripts and completed the independent ratings. Once the initial

<table>
<thead>
<tr>
<th>Box 1. Feedback questionnaire completed by participants at the conclusion of their treatment intervention program.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Please indicate how relevant you found this program to your needs</td>
</tr>
<tr>
<td>(1 = very irrelevant and 5 = very relevant)</td>
</tr>
<tr>
<td>1 2 3 4 5</td>
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<tr>
<td>2. If you had the opportunity to attend this program in your own area would you attend?</td>
</tr>
<tr>
<td>Yes or No</td>
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<tr>
<td>If “No” please explain why not.</td>
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<tr>
<td>If “Yes” would you be willing to pay a fee for his service: Yes or No</td>
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<tr>
<td>3. Do you expect to make any changes to your life as a result of this program?</td>
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<tr>
<td>Yes or No</td>
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<tr>
<td>If “Yes” please explain</td>
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<tr>
<td>4. Are there other topics you think should be covered in this program?</td>
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<tr>
<td>Yes or No</td>
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<tr>
<td>If “Yes” what are they</td>
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<tr>
<td>5. Please rate the overall program presentation</td>
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<tr>
<td>(1 = strongly disagree and 5 = strongly agree)</td>
</tr>
<tr>
<td>(a) Clear 1 2 3 4 5</td>
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<tr>
<td>(b) Relevant 1 2 3 4 5</td>
</tr>
<tr>
<td>(c) Interesting 1 2 3 4 5</td>
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<tr>
<td>(d) Informative 1 2 3 4 5</td>
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<tr>
<td>6. Please provide any further comments/recommendations about the program.</td>
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<tr>
<td>SESSION NUMBER</td>
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</tbody>
</table>
Table 1. Continued

<table>
<thead>
<tr>
<th>SESSION NUMBER</th>
<th>TOPIC INTRODUCED/PROGRAM OUTLINE</th>
<th>NO. ITEMS RATED</th>
<th>EDUCATION GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COGNITIVE ACTIVITY GROUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Recognizing the symptoms of depression 11</td>
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<tr>
<td></td>
<td>Tea break</td>
<td>1</td>
<td>Tea break 1</td>
</tr>
<tr>
<td></td>
<td>Discussion regarding depth of processing</td>
<td>13</td>
<td>Treatments for depression 3</td>
</tr>
<tr>
<td></td>
<td>Closing comments</td>
<td>5</td>
<td>Risk factors for depression 5</td>
</tr>
<tr>
<td>6</td>
<td>Brief review of previous session topic</td>
<td>3</td>
<td>Seeking help for depression 4</td>
</tr>
<tr>
<td></td>
<td>Introduce new topic</td>
<td>1</td>
<td>Closing comments 4</td>
</tr>
<tr>
<td></td>
<td>Using strategies in everyday settings</td>
<td>9</td>
<td>Introduce session topic 3</td>
</tr>
<tr>
<td></td>
<td>Tea break</td>
<td>1</td>
<td>Why is sleep so important 5</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Discussion of stages of sleep 7</td>
</tr>
<tr>
<td></td>
<td>Review importance of selective attention</td>
<td>9</td>
<td>Defining sleep problems 5</td>
</tr>
<tr>
<td></td>
<td>Memory strategies to be incorporated in the home and daily routine</td>
<td>6</td>
<td>Recognizing factors that might negatively influence sleep 6</td>
</tr>
<tr>
<td></td>
<td>Take home messages</td>
<td>7</td>
<td>Tea break 1</td>
</tr>
<tr>
<td>7</td>
<td>Closing comments</td>
<td>3</td>
<td>Improving sleep using medication 5</td>
</tr>
<tr>
<td></td>
<td>Introduce session outline</td>
<td>1</td>
<td>Closing comments 3</td>
</tr>
<tr>
<td></td>
<td>Review home strategy suggestions/group discussion</td>
<td>6</td>
<td>Introduce topic 1</td>
</tr>
<tr>
<td></td>
<td>Review previously learnt word pairs</td>
<td>2</td>
<td>What is the meaning of “old age”? 4</td>
</tr>
<tr>
<td></td>
<td>Review of attention, processing speed, executive functions</td>
<td>6</td>
<td>Challenging cognitive perceptions of the older adult 5</td>
</tr>
<tr>
<td></td>
<td>Tea break</td>
<td>1</td>
<td>Volunteering 8</td>
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<tr>
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<td>Exercise activity</td>
<td>4</td>
<td>Tea break 1</td>
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<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Discuss types of volunteer activities 6</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Deciding if volunteering is right for the individual 4</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Obtaining more information about volunteering</td>
</tr>
<tr>
<td></td>
<td>Closing comments</td>
<td>2</td>
<td>Closing comments 3</td>
</tr>
<tr>
<td>8</td>
<td>Introduce session outline</td>
<td>1</td>
<td>Introduce session 1</td>
</tr>
<tr>
<td></td>
<td>Aging and language skills</td>
<td>6</td>
<td>Definition of retirement 1</td>
</tr>
<tr>
<td></td>
<td>Definition of semantic memory</td>
<td>4</td>
<td>Implications of retirement (positive and negative) 7</td>
</tr>
<tr>
<td></td>
<td>Review of strategies for word finding difficulties</td>
<td>4</td>
<td>Involvement in different levels and types of activities 2</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Different types of activities/opportunities in retirement 6</td>
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<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Tea break 1</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Traveling in retirement 7</td>
</tr>
<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Health benefits of having a pet 7</td>
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<tr>
<td></td>
<td>Exercise activity</td>
<td>4</td>
<td>Closing comments 3</td>
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<td>Exercise activity</td>
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<tr>
<td></td>
<td>Closing comments</td>
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<tr>
<td>9</td>
<td>Introduce session outline</td>
<td>1</td>
<td>Introduce session 1</td>
</tr>
<tr>
<td></td>
<td>Discussion of strategies for keeping mentally fit</td>
<td>6</td>
<td>Fire safety tips 7</td>
</tr>
<tr>
<td></td>
<td>Review memory strategies</td>
<td>9</td>
<td>Home security 9</td>
</tr>
</tbody>
</table>
ratings of session content had been completed, the rating scale was further collapsed and new values were assigned to assist in analysis. “Not covered” and “Uncertain/unclear” were assigned a value of “0,” “Partially covered” was scored as “1,” and “Covered” was scored as “2,” as outlined in Table 2.

Exposure was maintained for each of the 11 groups in the respective CA and GE arms, by adhering to a strict 90-minute time limit for each session and ensuring that the same instructor consistently delivered all ten sessions, within each intervention, across the course of the trial. Attendance at each session was manually recorded in order to monitor levels of participation across both groups. A minimum of seven sessions was set a priori for participants to be considered as having completed the program.

Program differentiation was maintained by ensuring that there was no potential for overlap between groups, with participant sessions separated by a two-hour time frame. If a husband and wife wished to participate in the program and both met criteria, they were asked to self-select the individual who would take part in the trial. Participants were explicitly asked at each assessment not to discuss information regarding the intervention with research staff and, similarly, staff conducting assessments were instructed not to discuss with participants any aspects of the intervention.

Statistical analyses

Data were managed in Excel and analyzed with Stata version 11.0 (StataCorp, College Station, TX). We used descriptive statistics (mean, standard deviation of the mean (SD), proportions) to summarize our data, and Pearson’s $\chi^2$ statistic to test the frequency distribution of ratings. We calculated a fidelity score for each session by adding the ascribed ratings and dividing them by the maximum possible rating. For example, if there were 40 content items, a maximum possible score would be 80/80, with the 40 items having attracted a rating of “two” if they had been entirely covered. These values were converted to percentages for each session (e.g. 80/80 = 100%). An overall fidelity rating was later calculated by summing the percentages and determining the mean score for the 22 sessions randomly chosen to be rated. We established, a priori, that an overall fidelity rating of 90% or more indicated acceptable fidelity. Alpha was set at 5% and all tests reported are two-tailed.
Results

Of 160 participants, 80 were randomly assigned to the CA group. Participants in the CA and GE groups did not differ in age, education, or cultural background (p > 0.05; data not shown), though there were significantly more women in the CA group (p < 0.05; data not shown).

Seventy-four feedback forms were collected from the CA group and 68 from the GE group (out of a possible 80 participants in each group, respectively). The proportion of responses to questions one to five is presented in Table 3. The only significant difference between the two groups was the observation that the CA group reported only significant difference between the two groups (Table 3). The proportion of responses to questions one to five is presented in Table 3. The only significant difference between the two groups was that older people in the CA group rated the program to be significantly more relevant to their needs (χ² = 24.5, degrees of freedom (df) = 5, p < 0.01), as expected. Each program was rated equally highly with respect to clarity, interest, and how informative the content was and over 85% of participants from both groups surveyed indicated that they would attend this sort of program in their local area. More than two-thirds would be willing to pay a fee to receive the service, with no significant differences between the groups (Table 3).

An overall fidelity score was calculated for each group’s presentations, with these being 96.1% (SD = 2.39; 95% CI = 95.10, 97.10) and 94.7% (SD = 4.40; 95% CI = 92.87, 96.55) for the CA and GE groups, respectively. There was no significant difference in the number of sessions attended between groups, with mean attendance for the CA group being 8.1 sessions (SD = 2.8, range = 0–10), with 82.5% of the participants attending seven or more. Mean attendance for those randomized to the GE group was 8.4 sessions (SD = 2.6, range = 0–10), with 87.5% attending seven or more.

Discussion

The PACE trial was designed to identify the effect of a five-week CA intervention on cognitive decline for older adults with MCI, although it was critical to the interpretation of the main results of the study that appropriate acceptability and fidelity are established. We found that there was no difference in attendance between the CA and GE groups, the ratings of content material, and willingness to participate in such a program within a community setting. The only difference was that older people in the CA group rated the program to be significantly more relevant to their needs, as expected.

Assessment of treatment fidelity and, more specifically, delivery of the intervention revealed a high level of consistency, confirming that the intervention programs were delivered as intended, with no apparent bias with respect to the quality of the presentations. In addition, participant attendance was generally high, which provides a further indication of satisfaction with the program content and delivery.

Manualizing the program interventions was certainly critical to ensure reproducibility of the intervention, which should now be tested in different settings and populations. This process, together with the recording of sessions, ensured consistency in delivery and assisted in minimizing issues of contamination. Furthermore, contamination was also avoided by adopting a lengthy time interval between groups so that participants from the differing conditions did not come into contact with each other. Resource materials were also securely stored so as to reduce opportunity for accidental exposure.

With respect to identifiable limitations, participants were motivated volunteers with a vested interest in improving their cognition. It remains unclear as to whether the acceptability of the intervention would be as high in a general community setting. Furthermore, the adopted measure of acceptability was possibly limited in scope, given the brevity and specific nature of the questionnaire. The degree to which these forms of programs are readily adopted by participants and practically applied will only be determined once we are able to establish efficacy and the interventions implemented in clinical practice. With respect to the fidelity assessment, the number of sessions randomly chosen to be reviewed was relatively small. This in part reflected the time and costs involved in transcribing the extensive number of sessions which were run with each of the groups. More precise estimates of fidelity would require extension of the study activities. Finally, measures of fidelity were limited to the number of content units delivered by the two interventions. It is unclear if good fidelity translates into greater benefits for patients and we are currently in the process of evaluating the results of the trial.

Assessing a research trial’s acceptability and fidelity allows investigators and independent reviewers to draw more accurate conclusions regarding the merits of any observed outcomes. Ideally, these assessments should be reported in publications of intervention trials. The consequences associated with treatment fidelity may potentially be minimized if the intervention is designed by the therapist intended to deliver it. However, the delivery of the intervention by the same individual becomes crucial, particularly if procedures are not in place to manage situations whereby an alternate party is required to deliver the program. Additionally, and in large recruitment pools, by
Table 3. Percentage ratings for feedback questionnaires post-program completion

<table>
<thead>
<tr>
<th>RATING SCALE</th>
<th>CA GROUP (N = 74)</th>
<th>EDUCATION GROUP (N = 68)</th>
<th>P</th>
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<tbody>
<tr>
<td>Q1 Program relevant</td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Very irrelevant</td>
<td>1.4</td>
<td>13.2</td>
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<tr>
<td>Irrelevant</td>
<td>2.7</td>
<td>1.5</td>
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<tr>
<td>Neutral</td>
<td>6.8</td>
<td>23.5</td>
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<tr>
<td>Relevant</td>
<td>23.0</td>
<td>27.9</td>
<td></td>
</tr>
<tr>
<td>Very relevant</td>
<td>62.2</td>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>4.1</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Q2 Attend locally</td>
<td></td>
<td></td>
<td>0.225</td>
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<td>Q2 Pay fee</td>
<td></td>
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<td>71.6</td>
<td>67.6</td>
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<td>No response</td>
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<td></td>
<td></td>
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<tr>
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<td>82.4</td>
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<td>14.9</td>
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<td>5.9</td>
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<td></td>
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<td>Yes</td>
<td>21.6</td>
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<td>54.1</td>
<td>47.1</td>
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<td>24.3</td>
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<td>Q5a Clear</td>
<td></td>
<td></td>
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<tr>
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<td>2.9</td>
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<td>1.5</td>
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<tr>
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<td>16.2</td>
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<td>Q5b Relevant</td>
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<td>Q5c Interesting</td>
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<td>1.5</td>
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<td>57.4</td>
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<td>Q5d Informative</td>
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<td>2.9</td>
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<tr>
<td>Strongly agree</td>
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<td>63.2</td>
<td></td>
</tr>
<tr>
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<td>6.8</td>
<td>11.8</td>
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</table>
Treatment fidelity and acceptability

utilizing a manualized script and recording sessions, consistency in delivery can be ensured. The type of questionnaire/measure utilized in the PACE trial can readily be adapted for all intervention programs to ensure integrity, regardless of whether the format is group or individualized, computer versus pencil and paper etc. The criteria proposed by Dane and Schneider (1998) have relevance for all forms of intervention delivery – computer-based training or otherwise and future standardization on the minimum details to be reported would help with pooling of data across trials. To our knowledge, there are no other recently published RCTs of individuals with MCI who have participated in a cognition-focused intervention, and whereby the acceptability and fidelity have been systematically reported.

In conclusion, this study showed that the PACE interventions were delivered in accordance to the program manual and that the project activities were well received by participants. Future studies will determine if the intervention is similarly well accepted in other clinical settings and if the efficacy of the program is directly related to acceptability and fidelity measures.

Conflict of interest

None.

Description of authors’ roles

All authors are members of the PACE project group and participated in the conceptualization and implementation of the study. MRV acts as guarantor of the data and has been responsible for the day-to-day supervision of research staff and delivery of the interventions. All investigators have contributed to design the study and to obtain funding. MRV has drafted this manuscript, which has been critically reviewed by OPA, NTL, LC, and LF.

Acknowledgments

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References


Objective: The role of cognition-focused interventions in reducing cognitive decline in older people remains uncertain. This study aimed to clarify whether a group cognitive activity (CA) strategy-training program would decrease the 2-year rate of cognitive decline of people with mild cognitive impairment (MCI). Design: Randomized controlled trial. Setting: One study site. Participants: 160 older adults with MCI ≥65 years of age (mean: 75, SD: 5.8). Intervention: Five-week CA strategy training or a control nonspecific educational program. The primary outcome measure was change from baseline in the total score on the Cambridge Cognitive Examination-Revised (CAMCOG-R). Secondary outcomes of interest included changes in memory, attention, executive functions, mood, and quality of life. Endpoints were collected 10, 52, and 104 weeks post baseline. Results: Intention to treat analysis identified no significant difference in CAMCOG-R scores over time between the two groups (mean difference: −0.36, 95% CI: −1.02,0.29) or across secondary outcome measures. The exceptions were better performance of the CA group on immediate attention (Digit Span Forwards, adjusted mean difference: 0.15, 95% CI: 0.01,0.30) and better quality of life (adjusted mean difference: 0.57, 95% CI: 0.10,1.04) compared with controls. Conclusion: The devised program of CA did not improve general cognitive performance of older adults with MCI over a period of 2 years. Although favorable, the beneficial effects of the intervention on attention and quality of life were small, and of uncertain significance. (Am J Geriatr Psychiatry 2015; 23:360–372)

Key Words: Neuropsychology, cognition, dementia, prevention, intervention
With the aging of the world’s population, dementia is becoming an increasingly important public health issue. Available treatments for Alzheimer disease do not alter disease progression and, therefore, focus has been shifting towards prevention. Identifying modifiable risk factors for dementia is a burgeoning area of interest, with significant attention being given to the benefits derived from participation in mentally stimulating activities. Observational studies have shown that people involved in such activities (e.g., reading, playing Mahjong) have better cognitive function and a reduced risk of dementia over time. Similarly, cognition-focused interventions (CFIs) utilizing relatively preserved cognitive functions aim to maintain or delay further decline. Improvements on subjective measures of mood and quality of life have also been reported, although the clinical impact of CFIs remains to be established.

There are, however, few randomized controlled trials (RCTs) of CFIs with older adults (healthy or otherwise) and, because of methodological shortcomings, their results have been difficult to generalize. These issues were highlighted in a recent publication reviewing the varied therapeutic approaches targeting individuals with cognitive compromise and the lack of theoretically driven models for evaluating efficacy. Importantly, it remains to be established if participation in this type of intervention can prevent dementia. This is particularly pertinent for people with mild cognitive impairment (MCI), who are at increased risk of conversion to dementia. In light of the many varied factors that seem to influence cognitive functioning, individuals with MCI are viewed as an appropriate target group for dementia prevention strategies. Identifying the role that CFIs can play in stabilizing or reversing decline in this group of patients would have significant public health implications.

The primary objective of the Promoting Healthy Ageing with Cognitive Exercise (PACE) RCT was to determine whether a cognitive activity training strategy (CATS) program could decrease the rate of decline among older people with MCI over a follow-up period of two years. To this end, participants were provided strategies and coaching during group sessions to enhance cognitive functioning. A nonspecific educational “control” group was offered a 5-week program of more generalized presentations on healthy aging and retirement. We hypothesized that participants randomized to the CATS group would experience less cognitive decline than older adults allocated to the educational group.

**METHODS**

**Participants and Design**

This single-blind RCT was registered with the Australian Clinical Trials Registry (ACTRN1260800556347). Detailed information about the participants, training program, experimental design and outcome measures has been provided elsewhere. Briefly, 324 community volunteers were screened for the presence of MCI according to published criteria. Clinical evaluation of MCI was established by identifying performances 1.5 standard deviations below age and sex norms on any Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) cognitive task. Additionally, participants had to be aged 65 years or over, proficient in spoken and written English, and able to travel to the research center. Individuals with an established diagnosis of dementia according to International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, criteria for research or who showed signs of cognitive impairment (as evidenced by a Mini Mental State Examination MMSE, score of 23 or less) were excluded. Additional exclusion criteria included current psychiatric disorder, current hazardous or harmful alcohol consumption, or a medical condition that could compromise participation in the study tasks (such as sensory impairment) or reduce medium-term survival (e.g., advanced cancer). Individuals who reported a clinical history of stroke associated with permanent disability were also excluded. One hundred sixty adults met criteria and attended a baseline assessment prior to being randomized into either the CATS or the control Education group. The human research ethics committees of the University of Western Australia and of the Royal Perth Hospital approved this study and all participants provided written informed consent. Procedures of this study followed the principles of the Declaration of Helsinki for Human Rights.

**Outcome Measures and Timeline of the Study**

Further assessments post baseline occurred at 10 weeks, 52 weeks, and 104 weeks. The primary outcome measure was the Cambridge Cognitive Examination...
Revised (CAMCOG-R), with participants also completing the California Verbal Learning Test–Second Edition (CVLT-II, standard and alternate forms), Digit Span and Symbol Search subtests from the Wechsler Adult Intellectual Scale–Third Edition (WAIS-III), the Trail Making Tests Part A and B, and the Controlled Oral Word Association Test (COWAT). Participants were also asked to complete questionnaires assessing mood, engagement in leisure activities, weekly physical activity, social support, quality of life, and perception of memory. Within one to two weeks of completing their program, participants were invited to return for a post intervention assessment (10-week timepoint). This testing session took approximately 90 minutes to complete and was undertaken by a research assessor blinded to group enrollment. Table 1 provides information regarding the assessment battery and interpretation of scores, including supportive references.

**Randomization, Sample Size and Power Calculation**

Randomization was undertaken in blocks of 12–18 according to a random list of numbers generated by computer, with 6–9 individuals allocated to each...
group. The allocation list was handled by an independent investigator not involved in the assessments or delivery of the intervention. Due to the nature of the intervention, participants were not blinded to group membership, although research assistants undertaking the follow-up assessments were. Participants and staff conducting the assessments were explicitly asked to not discuss information regarding the intervention. We are not aware of any breaches of protocol in this regard.

Older people living in the community lose approximately 1.6 points per year on the CAMCOG-R.24 Considering a possible 20% loss to follow up, with 64 people in each group, we calculated that the study would have 80% power to detect a between-group difference of 1.5 points on the CAMCOG-R (moderate effect size [0.5]) over time, consistent with delay in the progression of cognitive decline of about 12 months.

**Intervention**

Each program was administered to groups of six to nine individuals, with participants attending ten 90-minute sessions over a 5-week period (two sessions per week). A detailed description of the content of the programs has been published elsewhere.14 Briefly, the focus of the CATS was to discuss age-associated changes in cognition, with opportunity to undertake activities illustrating strategies to enhance attentional capacity, memory functions, and executive processes. This information was adapted for application in everyday life to improve how participants managed their cognitive difficulties and offered the opportunity to practice these in a group setting. The sessions and strategies incorporated elements of cognitive rehabilitation, cognitive stimulation, and cognitive training. This form of CFI was chosen to overcome some of the limitations of other approaches, offer a format suitable for group delivery, be person-centered, and to address the particular needs of people with MCI. Each session was divided into two halves separated by a 10- to 15-minute tea break.

The control Education group was provided with a series of presentations on healthy aging, including the impact of lifestyle factors. Sessions comprised watching videos and group discussion. Topics included memory functioning and dementia, physical activity and diet, stress and depression, sleep and sleep disturbance in older adulthood, the effects of retirement, and community safety. Each session was also divided into two halves separated by a 10- to 15-minute tea break.

A clinical neuropsychologist ran each of the groups, exposing the participants to the same intervention format, amount of instructor time, and social contact. All participants were given a manual containing the session content and material. Participants were not required to engage in any additional activities beyond that delivered during their contact in group sessions. Participants in the CATS program were actively encouraged to incorporate the strategies discussed during their sessions into their daily routines.

At 6 months post baseline participants received a “booster” telephone call, which consisted of a summation of their program material and addressed any concerns. Thirty minutes of additional pencil and paper tasks was posted to participants in the CATS group for completion prior to the booster call and served as the basis for discussion during the telephone contact. A face-to-face booster session was also conducted in small groups with participants approximately 1 month after their 52-week follow-up assessment. All booster sessions were conducted by the clinical neuropsychologist who had run the group interventions.

**Fidelity Assessment**

A fidelity study of the intervention showed that sessions were delivered as planned and per protocol.25 Calculation of a fidelity score based on 44 randomly selected sessions revealed results of 96.1% (standard deviation [SD]: 2.39; 95% confidence interval [CI]: 95.1, 97.1) and 94.7% (SD: 4.40; 95%: CI 92.87, 96.55) for the CATS and control group, respectively, indicating a high level of consistency with regard to the manualized presentation content.

**Statistical Analyses**

The data were managed and analyzed using Stata 12.1 (StataCorp, College Station TX). We used descriptive statistics to summarize numerical (mean, SD, and 95% CI) and categorical data (number and proportions). t and Pearson χ² statistics to compare participants randomly assigned to the interventions (numerical and categorical data, respectively). The primary analyses of the study were
intention-to-treat and used all available information on generalized linear mixed models for repeated measures (effect of time), with each person treated as a random effect (xtmixed command). We initially investigated the effect of the interaction between time (10, 52, and 104 weeks) and the intervention on the outcomes of interest, but later dropped the interaction terms from all analyses as they were not statistically significant. Due to imbalance in the distribution of sex in the study groups after randomization, the variable was entered as a covariate in all analyses. The analysis of the primary outcome measure (CAMCOG-R) was subsequently repeated excluding participants who had not adhered to the intervention (i.e., they completed 6 or fewer of the 10 sessions of the program) and again for those who had provided valid outcome data at all assessments (completers). Finally, we used the Pearson $\chi^2$ statistic to analyze the impact of the intervention on the diagnosis of MCI at the end of the follow-up period and on the proportion of participants lost during follow-up.

Alpha was set at 5% and all tests reported are two-tailed.
RESULTS

One hundred sixty older adults with MCI were randomly assigned to the control or CATS interventions (1:1 allocation). Figure 1 summarizes the flow of participants over two years. At the end of the 10-week intervention, one control and three participants in the CATS group did not provide valid follow up data. At

**TABLE 2. Demographic and Clinical Characteristics at the Time of Randomization**

<table>
<thead>
<tr>
<th>Characteristic/Measure</th>
<th>Controls (N = 80)</th>
<th>Cognitive activity (N = 80)</th>
<th>Statistic (df)</th>
<th>p value</th>
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<tr>
<td>Demographics</td>
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</tr>
<tr>
<td>Age, mean years (SD)</td>
<td>74.9 (5.5)</td>
<td>75.1 (6.1)</td>
<td>t = 0.51 (158)</td>
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<td>51 (63.7)</td>
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<td>High school education, N (%)</td>
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<td>AUDIT</td>
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<td>Non drinkers, N (%)</td>
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<td>61 (76.2)</td>
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<td>Risky, N (%)</td>
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<td>6 (7.5)</td>
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<td>Current, N (%)</td>
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<td>1 (1.5)</td>
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<td>Physically active, N (%)</td>
<td>26 (32.5)</td>
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<td>Leisure Activities</td>
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<tr>
<td>Plays Board Games rarely, N (%)</td>
<td>74 (92.5)</td>
<td>68 (85.0)</td>
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<tr>
<td>Reads Novels/Books rarely, N (%)</td>
<td>39 (48.75)</td>
<td>45 (56.25)</td>
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<td>Plays newspapers/journals rarely, N (%)</td>
<td>17 (21.25)</td>
<td>19 (23.75)</td>
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<td>Plays a musical instrument rarely, N (%)</td>
<td>77 (96.2)</td>
<td>78 (97.5)</td>
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<td>Crossword puzzles/Sudoku rarely, N (%)</td>
<td>63 (78.75)</td>
<td>50 (62.5)</td>
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<td>Writes letters/novels/emails rarely, N (%)</td>
<td>57 (71.25)</td>
<td>57 (71.25)</td>
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<td>Participates in Grp Discussion rarely, N (%)</td>
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<td>68 (85.0)</td>
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<td>Arthritis, N (%)</td>
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<td>Diabetes, N (%)</td>
<td>8 (10.0)</td>
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<td>Hypertension, N (%)</td>
<td>38 (47.5)</td>
<td>36 (45.0)</td>
<td>χ² = 0.10 (1)</td>
<td>0.751</td>
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<tr>
<td>Stroke, N (%)</td>
<td>6 (7.5)</td>
<td>8 (10.0)</td>
<td>χ² = 0.51 (1)</td>
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<td>Heart Attack, N (%)</td>
<td>14 (17.5)</td>
<td>15 (18.7)</td>
<td>χ² = 0.04 (1)</td>
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<td>Heart Failure, N (%)</td>
<td>3 (3.75)</td>
<td>6 (7.5)</td>
<td>χ² = 1.06 (1)</td>
<td>0.303</td>
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<tr>
<td>Poor Circulation, N (%)</td>
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<td>21 (26.2)</td>
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<td>0.581</td>
</tr>
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<td>Asthma, N (%)</td>
<td>16 (20.0)</td>
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<td>Emphysema, N (%)</td>
<td>5 (6.25)</td>
<td>4 (5.0)</td>
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<td>Osteoporosis, N (%)</td>
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<td>Cancer, N (%)</td>
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<td>Depression, N (%)</td>
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<tr>
<td>Dementia, N (%)</td>
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<td>Anxiety, N (%)</td>
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<td>0.276</td>
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<td>Thyroid Disorder, N (%)</td>
<td>13 (16.2)</td>
<td>8 (10.0)</td>
<td>χ² = 1.57 (1)</td>
<td>0.242</td>
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<tr>
<td>Closed Head Injury, N (%)</td>
<td>11 (13.7)</td>
<td>11 (13.7)</td>
<td>χ² = 0 (1)</td>
<td>1.000</td>
</tr>
<tr>
<td>SAILS, mean score (SD)</td>
<td>148.3 (1.2)</td>
<td>148.1 (1.6)</td>
<td>t = 0.80 (258)</td>
<td>0.427</td>
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<tr>
<td>Psychosocial Measures</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PHQ-9, mean score (SD)</td>
<td>4.5 (4.6)</td>
<td>4.0 (3.6)</td>
<td>t = 0.48 (158)</td>
<td>0.633</td>
</tr>
<tr>
<td>QoL, mean score (SD)</td>
<td>38.9 (5.0)</td>
<td>37.8 (4.8)</td>
<td>t = 1.43 (158)</td>
<td>0.156</td>
</tr>
<tr>
<td>SNSQ, mean score (SD)</td>
<td>19.1 (2.9)</td>
<td>19.2 (2.1)</td>
<td>t = 0.28 (158)</td>
<td>0.779</td>
</tr>
<tr>
<td>MFQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Frequency of Forgetting, mean (SD)</td>
<td>117.3 (19.1)</td>
<td>117.0 (23.6)</td>
<td>t = 0.09 (158)</td>
<td>0.951</td>
</tr>
<tr>
<td>Seriousness of Forgetting, mean (SD)</td>
<td>80.4 (19.7)</td>
<td>76.7 (21.4)</td>
<td>t = 1.07 (158)</td>
<td>0.406</td>
</tr>
<tr>
<td>Retrospective Functioning, mean (SD)</td>
<td>15.8 (6.2)</td>
<td>16.3 (7.0)</td>
<td>t = 0.49 (158)</td>
<td>0.624</td>
</tr>
<tr>
<td>Mnemonics Usage, mean (SD)</td>
<td>24.9 (8.2)</td>
<td>24.7 (9.8)</td>
<td>t = 0.10 (158)</td>
<td>0.919</td>
</tr>
</tbody>
</table>

Notes: df: degrees of freedom; χ²: Pearson χ² statistic; t: Student t test; NESB: Non English Speaking Background; AUDIT: Alcohol Use Disorders Identification Test; SAILS: Structured Assessment of Independent Living Skills; PHQ-9: Patient Health Questionnaire-Nine Item; QOL-AD: Quality of Life in Alzheimer’s Disease; SNSQ: Social Network Satisfaction Questionnaire; MFQ: Memory Functioning Questionnaire.
The PACE Study for MCI

Table 3. Mean Scores and Standard Deviations of Cognitive Measures at Baseline Assessment

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (SD) Controls (N: 80)</th>
<th>Cognitive activity (N: 80)</th>
<th>Statistic (df = 158)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMCOG-R</td>
<td>90.6 (6.4)</td>
<td>89.5 (6.9)</td>
<td>t = 1.09</td>
<td>0.277</td>
</tr>
<tr>
<td>CVLT-II Total Recall</td>
<td>37.1 (11.0)</td>
<td>38.1 (11.9)</td>
<td>t = 0.95</td>
<td>0.584</td>
</tr>
<tr>
<td>CVLT-II Short Delay Free Recall</td>
<td>6.1 (3.5)</td>
<td>6.5 (3.6)</td>
<td>t = 0.66</td>
<td>0.512</td>
</tr>
<tr>
<td>CVLT-II Long Delay Free Recall</td>
<td>6.4 (3.8)</td>
<td>6.8 (4.0)</td>
<td>t = 0.76</td>
<td>0.447</td>
</tr>
<tr>
<td>Digit Span Forward Span</td>
<td>5.9 (1.1)</td>
<td>6.1 (1.2)</td>
<td>t = 1.10</td>
<td>0.277</td>
</tr>
<tr>
<td>Digit Span Backward Span</td>
<td>4.3 (1.1)</td>
<td>4.4 (1.1)</td>
<td>t = 0.72</td>
<td>0.475</td>
</tr>
<tr>
<td>Digit Span Total Score</td>
<td>14.5 (3.3)</td>
<td>15.0 (3.0)</td>
<td>t = 1.10</td>
<td>0.273</td>
</tr>
<tr>
<td>TMT A time (sec)</td>
<td>46.0 (16.4)</td>
<td>46.0 (22.1)</td>
<td>t = 0.02</td>
<td>0.984</td>
</tr>
<tr>
<td>TMT B time (sec)</td>
<td>142.6 (81.1)</td>
<td>143.2 (84.9)</td>
<td>t = 0.05</td>
<td>0.961</td>
</tr>
<tr>
<td>Symbol Search (items completed)</td>
<td>19.7 (6.9)</td>
<td>21.0 (7.5)</td>
<td>t = 1.18</td>
<td>0.240</td>
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<tr>
<td>COWAT Total Score</td>
<td>36.2 (12.4)</td>
<td>35.4 (12.0)</td>
<td>t = 0.39</td>
<td>0.694</td>
</tr>
</tbody>
</table>


the 12-month assessment, three controls and three people in the CATS group did not contribute valid outcome data, and at the 24-month assessment outcome data were not available for 20 controls and 13 CATS participants. The age of participants ranged from 65–92 years and 86 (53.7%) of them were women. Table 2 summarizes the demographic and clinical characteristics of participants according to their group allocation at the time of randomization. The groups were well balanced for all variables, except for sex: there were more women in the CATS than control group.

Table 3 summarizes the cognitive outcome measures of the study before the intervention started. Participants assigned to the control and CATS groups showed similar abilities across all measures. Changes of scores on outcome measures immediately post the intervention and again after 52 weeks and 104 weeks are displayed in Table 4. The CATS intervention did not affect CAMCOG-R scores (primary outcome measure) over time compared with controls (mean difference: −0.36, 95% CI: −1.02, 0.29; results adjusted for sex imbalance and baseline score). The CATS intervention had no effect on all but three secondary outcome measures: participants in the CATS group had marginally better scores on Digit Span Forwards (adjusted mean difference: 0.15, 95% CI: 0.01, 0.30) and quality of life scores during follow-up (adjusted mean difference: 0.57, 95% CI: 0.10, 1.04). They also reported comparatively less concern about the need for use of mnemonics than controls (adjusted mean difference: −1.07, 95% CI: −2.12, −0.02). All analyses were controlled for sex and respective baseline scores.

We also investigated the effect of the intervention on those who participated in at least 70% of the intervention sessions (i.e., those who showed acceptable adherence: 70 controls and 66 CATS individuals). There was no obvious effect on CAMCOG-R scores when analyses were limited to those who had adhered to the intervention (adjusted mean difference: −0.15, 95% CI: −0.85, 0.56; adjusted for sex and baseline score). A case-complete analysis (i.e., limited to the 60 controls and 67 CATS participants who completed all assessments) confirmed that the intervention had no obvious effect on CAMCOG-R scores over time (adjusted mean difference: −0.36, 95% CI: −1.02, 0.29).

We then examined whether the intervention contributed to change in the MCI classification of participants during follow-up (Table 5). “Memory complainers” were those participants who no longer met MCI criteria. Those characterized as “amnestic” obtained a score on any one of the memory tasks from the CERAD (with the exception of the recognition trials) below normative cutoffs. “Non-amnestic” demonstrated impairment in a domain other than memory (e.g., praxis, naming, fluency). Those with impairment upon more than one measure were labelled with “plus”. At the 52-week assessment, 27 of 77 controls and 34 of 77 CATS participants no longer met criteria for MCI (odds ratio [OR]: 1.46, 95% CI: 0.72, 2.95), and at the 104-week assessment the numbers were 27 of 60 and 25 of 67 (OR: 0.73, 95% CI: 0.34, 1.57). Finally, we examined whether the intervention was associated with differential loss to follow-up; there was no difference between the two study groups (OR: 0.58, 95% CI: 0.24, 1.36).

Over the course of the trial, 16 individuals received a diagnosis of dementia from their treating doctor. Four of them (two from each group) dropped out of the
<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>Controls Mean (95% CI)</th>
<th>N</th>
<th>Cognitive activity Mean (95% CI)</th>
<th>Statistic (z)</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CAMCOG-R score</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>10 weeks</td>
<td>79</td>
<td>1.8 (1.1, 2.5)</td>
<td>77</td>
<td>2.0 (1.1, 2.9)</td>
<td>−1.09</td>
<td>0.276</td>
</tr>
<tr>
<td>52 weeks</td>
<td>77</td>
<td>1.1 (0.4, 1.9)</td>
<td>77</td>
<td>1.0 (0.3, 1.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>104 weeks</td>
<td>60</td>
<td>0.8 (−0.8, 2.5)</td>
<td>67</td>
<td>−0.6 (−2.3, 1.0)</td>
<td></td>
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</tr>
<tr>
<td>CVLT-II Total Recall</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>−3.0 (−4.6, −1.3)</td>
<td>77</td>
<td>−1.8 (−3.5, −0.1)</td>
<td>−0.27</td>
<td>0.787</td>
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<tr>
<td>52 weeks</td>
<td>76</td>
<td>0.2 (−1.4, 1.9)</td>
<td>77</td>
<td>−0.6 (−2.4, 1.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>104 weeks</td>
<td>59</td>
<td>−2.2 (−4.4, 0.0)</td>
<td>67</td>
<td>−3.1 (−5.5, −0.7)</td>
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<tr>
<td>CVLT-II Short Delay Free Recall</td>
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</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>−0.4 (−1.0, 0.2)</td>
<td>77</td>
<td>0.1 (−0.5, 0.7)</td>
<td>0.10</td>
<td>0.923</td>
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<tr>
<td>52 weeks</td>
<td>76</td>
<td>0.2 (−0.4, 0.8)</td>
<td>77</td>
<td>−0.0 (−0.7, 0.6)</td>
<td></td>
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<tr>
<td>104 weeks</td>
<td>59</td>
<td>−0.2 (−1.0, 0.6)</td>
<td>67</td>
<td>−0.3 (−1.0, 0.5)</td>
<td></td>
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<tr>
<td>CVLT-II Long Delay Free Recall</td>
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</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>−0.2 (−0.8, 0.5)</td>
<td>77</td>
<td>0.0 (−0.6, 0.6)</td>
<td>−0.35</td>
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<tr>
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<td>77</td>
<td>−0.3 (−1.0, 0.4)</td>
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<tr>
<td>104 weeks</td>
<td>59</td>
<td>−0.5 (−1.3, 0.2)</td>
<td>67</td>
<td>−0.7 (−1.5, −0.0)</td>
<td></td>
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<tr>
<td>Digit Span Forward Span</td>
<td></td>
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</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>0.29 (0.03, 0.56)</td>
<td>77</td>
<td>0.30 (0.07, 0.53)</td>
<td>2.06</td>
<td>0.039</td>
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<tr>
<td>52 weeks</td>
<td>77</td>
<td>−0.03 (−0.27, 0.22)</td>
<td>77</td>
<td>0.17 (−0.08, 0.42)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>0.15 (−0.15, 0.45)</td>
<td>67</td>
<td>0.16 (−0.12, 0.45)</td>
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<tr>
<td>Digit Span Backward Span</td>
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<tr>
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<td>0.1 (−0.1, 0.4)</td>
<td>77</td>
<td>0.1 (−0.1, 0.4)</td>
<td>1.48</td>
<td>0.140</td>
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<td>77</td>
<td>0.0 (−0.2, 0.2)</td>
<td></td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>−0.1 (−0.3, 0.2)</td>
<td>66</td>
<td>0.0 (−0.2, 0.3)</td>
<td></td>
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<tr>
<td>Digit Span Total Score</td>
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<td></td>
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</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>0.7 (0.2, 1.2)</td>
<td>77</td>
<td>0.6 (0.2, 1.0)</td>
<td>1.33</td>
<td>0.185</td>
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<tr>
<td>52 weeks</td>
<td>77</td>
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<td>0.4 (−0.1, 0.9)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>0.3 (−0.4, 1.0)</td>
<td>66</td>
<td>0.5 (−0.2, 0.9)</td>
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<tr>
<td>TMT A time (sec)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>10 weeks</td>
<td>78</td>
<td>−4.2 (−7.4, −1.1)</td>
<td>77</td>
<td>−2.9 (−6.4, 0.6)</td>
<td>1.20</td>
<td>0.231</td>
</tr>
<tr>
<td>52 weeks</td>
<td>77</td>
<td>−2.6 (−6.3, 1.2)</td>
<td>77</td>
<td>−0.3 (−3.8, 3.1)</td>
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<tr>
<td>104 weeks</td>
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<td>3.2 (−4.3, 10.7)</td>
<td>65</td>
<td>6.5 (0.8, 12.2)</td>
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<td>TMT B time (sec)</td>
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<tr>
<td>10 weeks</td>
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<td>104 weeks</td>
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<td>5.1 (−2.9, 13.2)</td>
<td>62</td>
<td>15.3 (−1.0, 31.7)</td>
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<tr>
<td>Symbol Search (items completed)</td>
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<tr>
<td>10 weeks</td>
<td>77</td>
<td>0.8 (−0.3, 1.9)</td>
<td>75</td>
<td>1.2 (0.2, 2.2)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>0.6 (−0.5, 1.7)</td>
<td>65</td>
<td>−0.4 (−1.9, 1.1)</td>
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<tr>
<td>COWAT Total Score</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10 weeks</td>
<td>78</td>
<td>1.4 (−0.2, 3.1)</td>
<td>77</td>
<td>2.3 (0.7, 3.8)</td>
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<td>52 weeks</td>
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<td>1.8 (0.1, 3.6)</td>
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<td>1.4 (−0.2, 3.0)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>2.0 (0.1, 3.9)</td>
<td>66</td>
<td>1.1 (−0.4, 2.7)</td>
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<tr>
<td>PHQ-9 Total Score</td>
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</tr>
<tr>
<td>10 weeks</td>
<td>79</td>
<td>−0.3 (−1.1, 0.4)</td>
<td>77</td>
<td>−0.3 (−1.0, 0.4)</td>
<td>−0.06</td>
<td>0.953</td>
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<td>52 weeks</td>
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<td>0.1 (−0.9, 1.1)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>−0.2 (−1.0, 0.6)</td>
<td>67</td>
<td>−0.4 (−1.2, 0.5)</td>
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<td>QoL Score</td>
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<td>−0.5 (−1.2, 0.3)</td>
<td>77</td>
<td>0.7 (−0.1, 1.5)</td>
<td>2.36</td>
<td>0.018</td>
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<tr>
<td>52 weeks</td>
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<td>77</td>
<td>0.0 (−0.7, 0.8)</td>
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</tr>
<tr>
<td>104 weeks</td>
<td>60</td>
<td>−1.0 (−1.8, −0.2)</td>
<td>67</td>
<td>−0.1 (−0.9, 0.7)</td>
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<tr>
<td>SNSQ Score</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 weeks</td>
<td>79</td>
<td>0.1 (−0.4, 0.5)</td>
<td>77</td>
<td>−0.1 (−0.6, 0.4)</td>
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<td>0.822</td>
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<td>77</td>
<td>0.3 (−0.2, 0.8)</td>
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<tr>
<td>104 weeks</td>
<td>60</td>
<td>0.3 (−0.2, 0.8)</td>
<td>67</td>
<td>0.1 (−0.4, 0.6)</td>
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<td>SAILS Score</td>
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<td>52 weeks</td>
<td>77</td>
<td>−0.0 (−0.7, 0.6)</td>
<td>76</td>
<td>−0.1 (−0.8, 0.5)</td>
<td>−1.20</td>
<td>0.231</td>
</tr>
<tr>
<td>104 weeks</td>
<td>60</td>
<td>−0.4 (−1.2, 0.3)</td>
<td>66</td>
<td>−0.6 (−1.4, 0.1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
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study after completing their 52-week assessment, with the other 12 individuals continuing to the final data collection point. Of these 16 individuals with dementia, 10 had been randomly assigned to CATS. The review of participants’ MMSE scores during follow-up showed that by 24 months, 11 participants had MMSE scores of less than 24, 9 of whom were in the CATS group. Analysis of the odds of attaining a MMSE less than 24 at the 12- and 24-month assessments, adjusting for baseline MMSE, showed that people in the CATS group had a nonsignificant increased odds of experiencing cognitive impairment compared with controls (OR: 3.48, 95% CI: 0.92, 13.18).

Acceptability of Program

The acceptability of the program was investigated to identify consumer satisfaction with the interventions,

Note: z: z statistic derived from a multilevel mixed model. 95% CI: 95% confidence interval of the mean difference; CAMCOG-R: Cambridge Cognitive Examination-Revised; CVLT-II: California Verbal Learning Test-Second Edition; TMT: Trail Making Tests; COWAT: Controlled Oral Word Association Test; PHQ-9: Patient Health Questionnaire-Nine Item; QOL-AD: Quality of Life in Alzheimer’s Disease; SNSQ: Social Network Satisfaction Questionnaire; SAILS: Structured Assessment of Independent Living Skills; MFQ: Memory Functioning Questionnaire.

*p value associated with the main effect of group (all interaction terms between time and group were not significant). The analyses were adjusted for sex and baseline scores of respective tests (i.e., all models had 4 degrees of freedom). Bold print highlights statistically significant results.

TABLE 5. Change in Mild Cognitive Impairment (MCI) Status Over Time

<table>
<thead>
<tr>
<th>Time Point</th>
<th>MCI Status</th>
<th>Controls</th>
<th>Cognitive Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total N = 80</td>
<td>N per status (%)</td>
<td>Total N = 80</td>
</tr>
<tr>
<td>Enrollment</td>
<td>Memory complainer</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Amnestic</td>
<td>33 (41)</td>
<td>50 (62)</td>
</tr>
<tr>
<td></td>
<td>Amnestic plus</td>
<td>28 (35)</td>
<td>23 (29)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic</td>
<td>13 (16)</td>
<td>5 (6)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic plus</td>
<td>6 (8)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>52 weeks</td>
<td>Memory complainer</td>
<td>27 (35)</td>
<td>34 (44)</td>
</tr>
<tr>
<td></td>
<td>Amnestic</td>
<td>31 (40)</td>
<td>27 (35)</td>
</tr>
<tr>
<td></td>
<td>Amnestic plus</td>
<td>13 (17)</td>
<td>12 (16)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic</td>
<td>6 (8)</td>
<td>4 (5)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic plus</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>104 weeks</td>
<td>Memory complainer</td>
<td>27 (45)</td>
<td>25 (37)</td>
</tr>
<tr>
<td></td>
<td>Amnestic</td>
<td>17 (28)</td>
<td>24 (36)</td>
</tr>
<tr>
<td></td>
<td>Amnestic plus</td>
<td>11 (18)</td>
<td>15 (22)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic</td>
<td>5 (9)</td>
<td>3 (5)</td>
</tr>
<tr>
<td></td>
<td>Non-amnestic plus</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
the details of which have been reported elsewhere.25 Session attendance was equivalent between the groups and in each group over 80% of participants attended seven or more sessions. At program completion, participants completed a questionnaire regarding their perceptions of the intervention. A total of 74 feedback forms were collected from the CATS group and 68 from the controls. Both groups indicated that the programs were relevant to their needs, although the CATS group reported the intervention to be significantly more relevant. Each program was rated equally highly with respect to clarity and interest and over 90% of all participants surveyed indicated they would attend this sort of program in their local area. More than 70% were willing to pay a fee, with no differences between the groups in their ratings (data not shown).

CONCLUSION

PACE recruited 160 older adults with MCI to determine whether a 5-week CATS program would decrease the rate of cognitive decline over two years. Analysis of our primary outcome measure, the CAMCOG-R, showed no effect of the intervention compared with controls. Two of our secondary measures seemed to favor the intervention (Digit Span and quality of life, QoL), although effect sizes were small and of questionable clinical significance.

Although identifying factors contributing to the lack of intervention effect is challenging, the following warrants consideration. The sex imbalance and excess of amnestic MCI in the CATS group could have biased the outcomes, although statistical adjustment did not alter the results. Moreover, the usefulness of the diagnosis of MCI has been questioned because of its notorious instability over time.13,26 More than one-third of the participants in our groups no longer met criteria for MCI at the 52- and 104-week follow-up periods, and this is consistent with previous comment regarding change in status with time.27 Another issue relates to the sensitivity of the outcome measures.2 We chose the CAMCOG-R because this instrument has previously been shown to be sensitive to change over time,24 although change in this MCI sample was minimal and, during the initial 12 months, scores actually improved in both groups, possibly as a consequence of practice. In addition, our secondary measures included the assessment of specific cognitive domains, such as attention, memory, processing speed, and executive functions. The improvement in immediate attention associated with the intervention did not appear to have implications for performance on additional tasks (e.g., translating to enhanced memory recall) and it remains uncertain if this effect reflects real improvement or is merely a chance finding attributable to Type 1 error. The possibility that knowledge of specific strategies altered the test-taking approach adopted by participants is entertained, however we did not systematically collect data regarding these behaviors. Interestingly, participants receiving the active intervention reported improved quality of life (QoL) and less reliance on the use of mnemonic strategies to enhance memory in day-to-day situations. Improvements in QoL have been reported in other CFIs,6 and one might speculate that participation in the intervention was associated with a modest increase in confidence and well-being despite this not appearing to translate into quantitative findings on objective test measures. Participation in the CATS program may have induced a false sense of security regarding memory ability, with individuals feeling that strategy use was no longer necessary. Unfortunately, neither self-report nor collateral measures of daily functioning were included and it remains unclear as to any potential study impact on instrumental activities of daily living. We adopted a practical measure (the SAILS), although due to the relatively high functioning nature of our MCI group, performances were at ceiling initially and did not change significantly over the length of study involvement. In addition, it is important to note that the impact of the intervention on these secondary outcomes may have been a chance finding that we would not have been able to declare as significant after adjustment for multiple comparisons.

The nature of the CATS program and the amount of content delivered over a relatively short time frame was possibly insufficient to lead to noticeable improvements or to afford opportunity to master skills or strategies necessary to translate into quantitative gains in cognition. Further, we did not objectively measure how actively participants were utilizing the information they were taught and trained at. Hence, although providing training and strategies to circumvent cognitive difficulties and increase participation in mentally stimulating activities, the
The PACE Study for MCI

intervention may have failed to lead to behavioral changes. Alternatively, as both programs were well received, it is possible that the lack of a differential effect of the intervention was due to a positive effect of the control Educational activity. It is unknown whether the material presented in the Education group influenced lifestyle choices, as these outcomes were not assessed systematically during the trial. For example, there is evidence that exercise decreases the rate of cognitive decline among people with MCI,\textsuperscript{28} as do certain diets in later life (such as the Mediterranean diet).\textsuperscript{29} It is, therefore, conceivable that the lack of difference between the groups might have been due to favorable outcomes associated with the educational intervention. In addition, participation in the control group exposed individuals to social interaction and stimulation, which is very different from a wait-list control or “usual care group”. This form of control group was utilized to maximize retention of study participants. It may be the case that participation in any mentally stimulating activity is beneficial regardless of its cognitive content. Similar findings were reported by a recent RCT with inactive older adults allocated to mental activity and physical activity intervention and control groups ($2 \times 2$ factorial design).\textsuperscript{30} There was no statistically significant difference between the groups, although all groups improved over 12 weeks. Practice effects or activity amount (not type) were postulated as potential reasons for the outcomes of the study.\textsuperscript{30}

The results of previous CFI trials with similarly aged participants with MCI have yielded both negative and positive findings. Rapp and colleagues\textsuperscript{31} engaged community-dwelling individuals with MCI in a multi-faceted intervention (memory training, relaxation training, cognitive restructuring) over a 6-week period, once a week, for 120 minutes and used a no treatment control group. Despite subjective improvement in memory, no significant benefits were observed on objective test measures.\textsuperscript{31} A lack of positive findings on objective outcome measures of memory was also noted by Troyer and colleagues,\textsuperscript{32} who randomized 54 participants with amnestic MCI to treatment or a waitlist control condition. The intervention consisted of ten 2-hour sessions over six months. Although there were significant differences in the knowledge and application of memory strategies, no practical objective cognitive benefit was demonstrated. Similarly, no significant differences on outcome measures of cognitive function were observed in the RCT conducted by Jean and collaborators.\textsuperscript{33} Regardless of the memory training technique implemented, the two intervention groups showed similar improvements. Adopting a multimodal approach, Tsolaki and colleagues\textsuperscript{34} concluded that it was possible to improve cognitive and functional performance in participants with MCI. Despite the nature of the intervention, however, there was no discussion regarding the observed pattern of performances on only 7 of the 21 objective measures and the statistical analysis adopted did not permit a thorough interpretation of pre and post intervention changes. Kinsella’s group\textsuperscript{35} reported encouraging outcomes following their RCT of 54 participants with amnestic MCI. Inspection of their results revealed improvement on a measure of prospective memory after training participants on strategies to manage every day memory problems. The investigators noted that at the longest follow-up period (4 months) the effect was no longer present. Finally, Huckans and colleagues\textsuperscript{12} conceded that reviewed data regarding the effectiveness of cognitive rehabilitation therapies for individuals with MCI remains “promising” though “inconclusive” and advocate for ongoing trials with more stringent study designs.

PACE was a single-site RCT utilizing community volunteers who were interested in participating due to concerns regarding memory. Hence, these findings require replication. Although our study possibly lacked power to detect differences between the groups over time, the confidence intervals of our effects estimates reveal that any putative effects missed would have been too small to be of clinical relevance. Due to our limited sample size, we lacked power to investigate “conversion” to dementia. Our analyses suggest an association in the opposite direction of that expected: More people in the CATS than in control group showed evidence of cognitive impairment at the end of the follow-up period.

In summary, whereas the PACE study was well received by participants, this form of CFI failed to decrease the 24-month rate of cognitive decline among older people with MCI. Other demonstrably effective interventions are needed to address this increasingly important public health issue.
We are most grateful to all volunteers taking part in the study and to our research staff, in particular Ms. Josephine Shaw, who was involved in data collection. This project is supported by grants from the Centre of Excellence in Alzheimer’s disease Research and Care (L0602) and the National Health and Medical Research Council (513772).

All authors (except KM) are members of the PACE project group and participated in the conceptualization and implementation of the study. All PACE investigators contributed to design the study and to obtain funding. MV acts as guarantor of the data and has been responsible for the day-to-day supervision of research staff and delivery of the interventions. MV, OPA, and KM analysed the data. MV drafted the manuscript with the assistance of OPA, which was later critically reviewed by NL, LC, and LF. All authors have approved the submission of the present paper to The American Journal of Geriatric Psychiatry.

The authors declare that they have no conflicts of interest.
The PACE Study for MCI

ETHICS COMMITTEE

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Dept of Internal Medicine Chairman
Tel: 9224 2461 Fax: 9224 2346
Email alasdair.millar@health.wa.gov.au

Room 4112, Level 4, Kirkman House
Tel: 9224 2292

Ref: EC 2007/051
(This number must be quoted on all correspondence)

16 November 2006

Ms Mandy Vidovich
School of Psychiatry & Clinical Neurosciences
Level 6, Ainslie House
Royal Perth Hospital

Dear Mandy

EC 2007/051 – A trial of cognitive activity for older adults with mild cognitive impairment

Further to your e-mail dated 15th November, 2006, I write to advise that he study is now APPROVED.

The following general conditions apply to all approvals by this Committee, and starting a trial or research project following the issue of ethics approval will be deemed to be an acceptance of them by all investigators:

1. The submission of an application for Ethics Committee approval will be deemed to indicate that the investigator and any sponsor recognises the Committee as a registered (with AHEC) Health Research Ethics Committee and that it complies in all respects with the National Statement on Ethical Conduct Research Involving Humans and all other national and international ethical requirements. The Committee will not enter into further correspondence on this point.

2. All income arising from the study must be lodged in a hospital special purposes account. Performance of a clinical trial for a sponsor is a service for tax purposes and all GST obligations must be met.

3. The investigator will report adverse events accompanied by a statement as to whether or not the trial should continue. The Committee reserves the right to not receive reports whose complexity or level of detail requires the expenditure of unreasonable time and effort. The Committee receives voluminous paperwork relating to adverse event reporting. From time to time the Committee chairman may require these reports to be summarised and approval is granted subject to the agreement of the investigator that he or she will prepare such a summary on request.

4. The Committee has decided that, as the responsibility for the conduct of trials lies with the investigator, all correspondence should be signed by the investigator.

5. All trial drugs must be dispensed by the Pharmacy Department. A fee is levied for this service and investigators must regard this fee as an item requiring a budget
allocation. Alternatively, if a sponsor agrees, separate direct funding of pharmacy services may be undertaken. There are provisions for this fee to be waived for locally-inspired unfunded studies not having an external sponsor.

6. Though state institutions are outside the jurisdiction of the Privacy Act and related legislation, the Committee will assume that the privacy provisions of that Act will be the minimum standards applying during the conduct of a trial at Royal Perth Hospital. Traditional standards of patient confidentiality will apply.

7. The Committee will not acknowledge trial communications as a matter of course, unless they relate to a matter requiring Committee approval. Evidence of dispatch of a letter will be deemed to be evidence of receipt. This rule may be waived at the Committee's discretion on provision of a pro forma receipt by the investigator for the Chairman's signature and return. However, trivial correspondence (as judged by the Committee) will not be acknowledged even if a pro forma receipt is provided. Where an investigator requests written approval or written record of a matter for special purposes (say at the request of a sponsor), the investigator should prepare the required letter for the chairman's signature rather than expect the Committee secretary to prepare it. This mechanism increases the probability that the trial details in the letter are correct.

8. The Committee will provide the names and representative affiliation of members on request, but will not provide personal details or voting records.

9. A brief annual report on each project approved will be required at the end of each fiscal year, in default of which approval for the study may be suspended. Ethics approvals at RPH do not carry an expiry date so the annual report is an important part of Ethics Committee procedure.

10. The Committee has the authority to audit the conduct of any trial without notice. Exercise of this authority will only be considered if there are grounds to believe that some irregularity has occurred or if a complaint is received from a third party, or the Committee wishes to undertake an audit for QA purposes.

11. Complaints relating to the conduct of a clinical trial should be directed to the Chairman and will be promptly investigated. Complaints about the Ethics Committee decisions or policies that cannot be resolved by discussion with the Chairman or about any actions of a particular member including the Chairman, should be directed to the Director of Clinical Services. Only written complaints (not e-mail) will be accepted for investigation.

Investigators of sponsored studies are advised to draw the above conditions to the attention of the sponsor.

Yours sincerely

J A Millar
Chairman, Royal Perth Hospital Ethics Committee

The Royal Perth Hospital Ethics Committee is constituted and operates in accordance with NH&MRC Guidelines.

cc: The Chief Pharmacist, RPH
cc: The Business Manager
cc: Naomi Lillywhite, Clinical Trials & SAS Pharmacist
EC 2007/051
(This number must be quoted on all correspondence)

Ms Mandy Vidovich
School of Psychiatry & Clinical Neurosciences
Ainslie House
Royal Perth Hospital

Dear Mandy

EC 2007/051 – A randomised clinical trial of cognitive activity for older adults with mild cognitive impairment

I refer to your letter dated 15th April 2008, requesting an extension of a further 12 months to the study and also an amendment to the original study, concerning an apoE gene investigation. I have pleasure in approving these requests and the revised Patient Information Sheets and Consent Forms.

Yours sincerely

F M van Bockxmeer
Chairman, Royal Perth Hospital Ethics Committee

The Royal Perth Hospital Ethics Committee is constituted and operates in accordance with NH&MRC Guidelines. An Annual Report on the progress of your trial will be required (see Committee explanatory notes available on Servio)
Introduction
We would like to invite you to join the above study because we believe you have mild cognitive impairment (MCI). People with MCI have cognitive abilities (eg. memory) at a level below what is considered normal for their age. Recent studies have shown that memory decline in older adults is associated with a number of potentially modifiable lifestyle factors, such as a lack of leisure and mentally stimulating activities. The purpose of this study is to investigate whether a cognitive activity (CA) program especially designed for people with MCI can reduce further cognitive decline and positively influence quality of life over a 12-month period.

What will you be required to do?
Firstly, you will be invited to a screening visit at Royal Perth Hospital (RPH) to determine if you are eligible to participate. This screening visit will take approximately one hour and will involve you answering questions and completing some tests (such as memory tests). If you are eligible, you will be randomly assigned (like tossing a coin) to one of two groups.

CA Intervention: In this group you will be asked to attend 90 minute sessions, twice a week, for five consecutive weeks, and will engage in education and strategy development about ways to manage ageing changes in cognition (eg. attention, memory and language skills). These sessions will be held at RPH and will be conducted with classes of no more than 10 participants.

Control Education Intervention: In this group you will participate in 90 minute sessions, twice a week, for five consecutive weeks, and will be provided with information and education regarding a range of issues relevant to older adults (including memory problems, depression, health and retirement). These sessions will be held at RPH and will be conducted with classes of no more than 10 participants.

Each of the program sessions will be audio-taped to ensure quality and consistency across each of the lesson plans and presentations.

Prior to commencing either of the programs, you will undergo an assessment of your cognition and complete questionnaires regarding leisure activities, mood and memory. This assessment will be repeated after the completion of the intervention and then twelve months later. These assessments will take approximately 90 minutes to complete. In total, you will need to attend Royal Perth Hospital 14 times over the course of 12 months.

Six months after joining the study you will be contacted by telephone and sent information in the mail. This phone call will provide the opportunity to review the information from your intervention sessions and allow you the opportunity to discuss any changes or differences in your level of functioning that you may have noticed. The information that you receive in the mail will also provide you with written reminders of the details of the intervention sessions you participated in.
What are the benefits and risks?
Overall this is a safe intervention designed specifically for people with mild cognitive problems. Each of the program sessions will be delivered by an experienced Clinical Neuropsychologist. The only possible issue arising from participation in the study are the effects of fatigue associated with the 90 minute sessions and the length of the assessments. You might also experience a degree of frustration or feel uncomfortable if you find any of the activities, tasks or tests challenging. These issues will be minimised by offering the opportunity for rest breaks and should you become distressed during any of the activities, you will be provided with extra assistance or the opportunity to discontinue the task in question.

By participating in the intervention you will receive the benefit of education on cognitive decline and ageing and the sessions will also provide an opportunity for group discussion. This study will assist in increasing knowledge regarding the effects of continued education and mental stimulation on the cognitive functioning of older adults.

What are my rights?
Participation in this study is voluntary and you are free to withdraw at any time without explanation. This will not affect your future medical treatment in any way. In the unlikely event that you suffer an adverse event or a medical accident during this study, arising from your participation in the study, you will be offered all full and necessary treatment by RPH. The Ethics Committee has approved this study on the basis (amongst others) that the reported risk of such an event is either small or acceptable in terms of the risk you face as a result of your current illness or the benefit that is possible with the new treatment being tested. No provisions have been made in this trial to offer participants who suffer an adverse reaction monetary compensation, but the absence of such a provision does not remove your rights to seek compensation under common law.

Confidentiality
All information provided by you and gathered during the course of the study will be held in strict confidence. It will be stored in a locked filing cabinet at RPH. The information will not have your name on it and will be identified by number only.

Further Information
This research project has been approved by the Ethics Committee at RPH. Further information may be obtained from the Chief Investigator, Ms. Mandy Vidovich (Tel: 08 9224 2855), or from Clin. Prof. J. A. Millar, Chairman of the Ethics Committee (Tel: 08 9224 2244).

I understand that the investigator and sponsor of the trial will adhere to usual standards of confidentiality in the collection and handling of my personal information and that the provisions of the Privacy Act 1988 will apply to the way my information is handled.
EC Reference Number: 2007/051

I, ................................................................. agree to participate in the above study. I have read and understood the Study Information and I have been given a copy of it. I have been given the opportunity to ask questions about the study and these questions have been answered to my satisfaction. I understand that I may withdraw from the study at any time without affecting any future medical treatment.

I have been advised as to what data is being collected, what the purpose is and what will be done with the data upon completion of the research. I understand that research data gathered for the study may be published and that my name or other identifying information will not be used.

Signed............................................................. Date .........................

Signature of Investigator............................ Date .........................
CONSENT TO A FURTHER TWELVE MONTH PERIOD OF PARTICIPATION IN A COGNITIVE ACTIVITY PROGRAM FOR OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT (PACE STUDY)

EC Reference Number: 2007/051

I……………………………………………………agree to participate in the above study for an additional 12 month period. I have been given the opportunity to ask questions about the additional commitments associated with extending my involvement in the project and these questions have been answered to my satisfaction. I understand that I may withdraw from the study at any time without affecting any future medical treatment.

I have been advised as to what data is being collected, what the purpose is and what will be done with the data upon completion of the research. I understand that research data gathered for the study may be published and that my name or other identifying information will not be used.

Signed……………………………………….. Date……………………
EC Reference Number: 2007/051

1. I agree to providing a sample of DNA. I direct that the sample be
   [kept only for this project] OR [stored indefinitely] [Circle your choice]
   I understand that a DNA sample may be used to study many genes and that any future study will be restricted to the area of interest covered by this project.

2. I direct that in the event of my death, existing information about my genes
   [may] OR [may not] [Circle your choice]
   be communicated to my first degree relatives if they so request.

3. I direct that in the event of my death, further DNA testing on my sample, possibly involving genes that are currently not specified,
   [may] OR [may not] be undertaken. [Circle your choice]

4. I understand that I have the right to request that my DNA sample be discarded at any time by writing to the Director of Clinical Services, Royal Perth Hospital, Perth, W.A 6001.

5. I understand that genetic information obtained by studying my DNA sample will only be communicated to a third party under the order of a court of law (including a search warrant) or where the hospital at its sole discretion considers that an over-riding public interest is satisfied.

Signed ..........................................................................................................................
Name ..........................................................................................................................
Date ..........................................................................................................................
INFORMATION SHEET REGARDING RECENT CHANGES TO THE PACE STUDY

Dear PACE participant

We were recently awarded additional funding to assist with our study looking at the benefits of cognitive activity for older adults with mild cognitive impairment. The provision of extra funding has meant that we will now be able to extend the period of time that we conduct follow-up assessments of study participants.

If you would like to participate in the study for a further 12 months we would ask you to complete the following:

1. A one hour booster session at Royal Perth Hospital. This session would be similar to the type of activities you were involved in the previous five week program you completed.

2. A repeat assessment of your cognition (similar to the two hour test battery that you have previously completed) in another 12 months time (making the total follow-up period 24 months).

If you decide to participate in the 12 month extension, you won’t receive individual feedback on your test scores until you complete the study. You will however be made aware of any clinically relevant decline.

Participating in the study for another 12 months is entirely optional. If you are willing to continue for a further 12 months, please sign the attached consent form.

Additionally, we are also interested in clarifying whether biochemical (such as plasma homocysteine) and genetic factors (such as apolipoprotein E (ApoE) genotype) are important in mediating participants’ responses to mental stimulation. Whilst one type of ApoE gene (ApoE4) has been previously associated with an increased risk of developing Alzheimer’s disease, it is well established that this gene does not cause the disease; it is simply another factor modulating the risk of developing the condition.

For this reason, we are also asking if you would be willing to donate a blood sample that will be stored in a freezer at the Department of Clinical Pathology and Biochemistry at Royal Perth Hospital. The blood sample will be taken before you have had breakfast (we will give you breakfast after the blood collection). If you do not wish to donate a blood sample you can also donate DNA by using a mouth swab.

The biochemical and genetic information will not be analysed until the very end of the study. Therefore, individual results will not be disclosed unless they are clinically relevant.

Providing a DNA sample is an optional part of the study and you are free to continue with the study if you prefer not to consent to the sample collection. A separate consent form regarding DNA sample storage and collection is attached.

If you have any additional questions or concerns regarding these two new components of the PACE study please call and asked to speak with any one of the investigators involved on 9224 2855.
Appendix C: Test Material and Questionnaires

NOTE: Appendix C has been removed due to copyright restrictions.
Appendix D: Fidelity Assessment Materials
PACE STUDY
FINAL SESSION FEEDBACK FORM

Completing this brief questionnaire gives you an opportunity to record your views and also provides for on-going development of our study. Thank you for taking the time to complete it.

1. Please indicate how relevant you found this program to your needs
   (1 = very irrelevant, and 5 = very relevant) Please circle.
   1  2  3  4  5

2. If you had the opportunity to attend this program in your own area would you attend?
   [ ] Yes (go to B)  [ ] No (go to A)
   a) If no, please explain why not.
      ____________________________________________________________
      ____________________________________________________________
      ____________________________________________________________

   b) If yes, would you be willing to pay a fee for this service?
      [ ] Yes  [ ] No

3. Do you expect to make any changes to your life as a result of this program?
   [ ] Yes  [ ] No
   If yes, please explain
      ____________________________________________________________
      ____________________________________________________________
4. Are there other topics you think should be covered in this program?

☐ Yes ☐ No

If yes, what are they?
_____________________________________________________________________________
_____________________________________________________________________________

5. Please rate the overall program presentation: (1=strongly disagree, and 5=strongly agree) Please circle.

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6. Please provide any further comments/recommendations about the program?
_____________________________________________________________________________
_____________________________________________________________________________

Thank you for your participation.
PACE STUDY
FINAL SESSION FEEDBACK FORM

Completing this brief questionnaire gives you an opportunity to record your views and also provides for on-going development of our study. Thank you for taking the time to complete it.

1. Please indicate how relevant you found this program to your needs
   (1 = very irrelevant, and 5 = very relevant) Please circle.
   1 2 3 4 5

2. If you had the opportunity to attend this program in your own area would you attend?
   ☐ Yes (go to B) ☐ No (go to A)
   a) If no, please explain why not.
      __________________________________________________________
      __________________________________________________________

   b) If yes, would you be willing to pay a fee for this service?
      ☐ Yes ☐ No

3. Do you expect to make any changes to your life as a result of this program?
   ☐ Yes ☐ No
   If yes, please explain
      __________________________________________________________
      __________________________________________________________
4. Are there other topics you think should be covered in this program?

☐ Yes  ☐ No

If yes, what are they?
_____________________________________________________________________________
_____________________________________________________________________________

5. Please rate the overall program presentation: (1=strongly disagree, and 5=strongly agree) Please circle.

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6. Please provide any further comments/ recommendations about the program?
_____________________________________________________________________________
_____________________________________________________________________________
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Thank you for your participation.
Promoting Healthy Ageing with Cognitive Exercise

The PACE Study: A Randomised Control Trial of Cognitive Activity for Older Adults with Mild Cognitive Impairment

Cognitive Activity Intervention

PROGRAM MANUAL TEMPLATE

Rating Key:
N = No, topic not covered
C = Topic completely covered
P = Topic partially covered
U = Unsure if topic covered
### Introduce Study

1. Welcome Participants
   -  
2. Remind of commitments required
   -  
3. Information on participant manuals
   -  
4. Review Purpose of the Research
   -  

**Comments:**

### Explain content of Manuals

1. Personal details in folders
   -  
2. Attendance days / Calendar
   -  
3. Participation Pledge
   -  

**Comments:**

### Review Behaviour Expectations

1. Confidentiality issues
   -  
2. Tea and toilet breaks
   -  
3. Problems understanding/hearing sessions
   -  
4. Discuss any concerns participants may have
   -  

**Comments:**

### Program Outline Provided

1. Discuss each session topic
   -  

**Comments:**
Introduce group members to each other
1. Name Tags  
2. Ice Breaker Exercise - Individual Introductions 

Comments:

Tea Break

Introductions continued
1. Introduce name game  
2. Each participant to have a try 

Comments:

Interview Exercise
1. Explain task requirements  
2. Participants to Interview each other (Act. 1.1)  
3. Participants to present interviewee to group (Act. 1.2)  
4. Quiz for recall of group member information (Act. 1.3) 

Comments:

Closing Comments
1. Introduce next session topic  
2. Thank participants for attending 

Comments:

Total:  

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### SESSION TWO: The Ageing Brain: Is it Really a Memory Problem?  
**Part One**

#### Welcome/Introduction of Session
- **NCPU**

#### Warm Up Exercise
1. **Name Game around group – Instructions**  
   - **NCPU**
2. **Each person participates**  
   - **NCPU**

#### Introduce Session Topic
1. Define the term cognition  
   - **NCPU**
2. Identify changes in cognition as we age  
   - **NCPU**
3. Review changes in learning of information  
   - **NCPU**
4. Mention changes to attention  
   - **NCPU**
5. Identify changes in memory  
   - **NCPU**
6. Identify alterations in processing speed  
   - **NCPU**

#### Introduce “attention” as cognitive construct and focus of session
1. Problems with memory can be due to problems with attention  
   - **NCPU**
2. Discuss impact of distractions  
   - **NCPU**
3. Provide examples of distraction on memory  
   - **NCPU**
4. Complete activity on divided attention
   a. Instructions given  
      - **NCPU**
   b. Participants encouraged for their effort  
      - **NCPU**
5. Complete activity demonstrating divided and sustained attention
   a. Instructions given  
      - **NCPU**
   b. Participants encouraged for their effort  
      - **NCPU**
6. Summarise purpose of exercises  
   - **NCPU**
7. Relate exercises to everyday experiences/activities  
   - **NCPU**

#### Comments:
- 
- 
- 
- 
- 
- 
-
Review strategies for improving attention
1. Level of Alertness
2. Minimising distractions
3. Using a list

Comments:

Tea Break

Introduce “processing speed” as cognitive construct
1. Explain what is meant by “processing speed”
2. Impact of familiarity on processing speed
3. Complete processing speed activity
   a. Instructions
   b. Participants encouraged regarding performance

Comments:

Strategies for coping with reduced processing speed
1. Reduce time pressures by planning ahead
2. Ask questions to allow extra time to process information
3. Practice – familiarity can reduce processing demands
4. Complete processing speed activity
   a. Instructions
   b. Participants encouraged regarding performance

Comments:
**Summarise and Review new concepts**

1. Poor memory can often be the result of poor attention
   - N □ C □ P □ U □
2. Discuss factors that can affect attention
   a. Distraction
   - N □ C □ P □ U □
   b. Concentration
   - N □ C □ P □ U □
   c. Time pressures
   - N □ C □ P □ U □
3. How to ensure we get the most out of information
   a. Minimise fatigue
   - N □ C □ P □ U □
   b. Minimise distractions
   - N □ C □ P □ U □
   c. Make lists
   - N □ C □ P □ U □
4. Mention effects of sensory problems on the processing of info.
   - N □ C □ P □ U □

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**Exercise Activity**

1. Handout cards and explain task
   - N □ C □ P □ U □
2. Clarify task requirements
   - N □ C □ P □ U □
3. Encourage/congratulate performances
   - N □ C □ P □ U □
4. Instruct on second component of activity
   - N □ C □ P □ U □
5. Handout cards and clarity task
   - N □ C □ P □ U □
6. Encourage/congratulate performances
   - N □ C □ P □ U □
7. Review purpose of activity
   - N □ C □ P □ U □

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**Closing Comments**

1. Thank participants for attending
   - N □ C □ P □ U □
2. Introduce new session topic
   - N □ C □ P □ U □
3. Clarify any questions/concerns
   - N □ C □ P □ U □

**Comments:**

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**Total:** N /48 C /48 P /48 U /48
SESSION THREE: The Ageing Brain: Is it Really a Memory Problem?
Part Two

Brief review of previous session topic
1. Changes in attention
2. Processing Speed Changes
3. Impact of these changes on memory

Comments:

Introduce cognitive construct of “executive functions”
1. Executive processes include a range of abilities
   a. Planning and organisation
   b. Time management
   c. Strategy use
2. Military adage “Those who fail to plan, plan to fail”
   a. Benefits of planning and organisation
   b. Importance of doing things systematically
   c. Influence on daily routine

Comments:

Exercise Activities
1. Instruction Recall
   a. Explanation of task requiring remembering of instructions
   b. Presentation of task
   c. Participant Response
   d. Second component of task introduced
   e. Participant response
   f. Encouragement regarding performance
2. List recall
   a. Explanation of task requiring learning list of words
   b. Presentation of list
   c. Participant response
   d. Encouragement regarding performance

Comments:
Examples of strategies for use in the home:
1. Don’t rely on scrap pieces of paper
2. Use a diary
3. Use calendars/wall charts
4. Complete activities straight away
5. Write important things down
6. Utilise routines
7. Have set places for objects
8. Keep objects in sight
9. File documents away
10. Create a Memory Notebook

Comments:

Construct Manuals/Notebooks
1. Introduce activity
2. Explain each entry into notebooks
3. Review completed book with participants

Comments:

Tea Break

Discuss non-cognitive factors that could be influencing memory
1. Psychological factors
   a. Depression, Grief, Anxiety and Stress
   b. Pessimistic/Negative Attitude
   c. Lack of mental stimulation
2. Health factors
   a. Physical Illness
   b. Medications
   c. Sensory Losses
   d. Fatigue
   e. Alcohol
   f. Poor Nutrition

Comments:

Summarise and Review new concepts
1. What is meant by the term executive functions
2. Ways that executive functions can influence memory
3. Executive Function strategies to maximise memory
4. Influence of lifestyle factors on memory

Comments:
### Closing Comments

1. Review purpose of session
2. Introduce topic for next session
3. Address any questions

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SESSION FOUR: Memory: The Basics - Misconceptions, Home Truths and All That’s in Between

Introduction/Welcome Group

Brief review of previous session topics

1. Attention
   a. Need to focus; give full attention
   b. There is only so much information we can retain
   c. Distractions can cause information to be lost
   d. The key is to minimise distractions

2. Processing speed
   a. Information can take us longer to process
   b. May need repetition and slowed presentation

3. Planning & Organisation
   a. Forgetting can be due to a lack of organisation
   b. Be systematic in planning/organising your lifestyle
   c. Have set places for objects; return them immediately
   d. Store important information safely

4. Psychological Issues
   a. Mood state

5. Health Issues
   a. Illness
   b. Medications
   c. Alcohol

Comments:

Examples of myths about memory

1. Ageing and memory loss go hand in hand
2. Nothing can be done to stop memory loss
3. You can’t teach an old dog new tricks
4. Group discussion

Comments:
Introduce topic on how memory works

1. We need to learn how we remember information in the 1st place
2. Two terms you might be familiar with – WM or STM and LTM
3. Learning new info. also requires encoding, storage and retrieval

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Working Memory/Short Term Memory

1. Temporary memory store
2. Small amount of info. that can be held in the mind at one time
3. Can hold no more than 6/7 items
4. Material discarded after 5-10 secs unless repeated or stored in LTM
5. An example is a telephone number
6. Only a fraction of info in WM is stored in LTM
7. Activity – Digit Span

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Long Term Memory

1. The memory bank
2. Largest component of the memory system
3. Storage space is practically limitless
4. Information no longer in conscious awareness; stored away
5. Activity demonstrating difference between STM and LTM

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Introduce terms: encode, storage, retrieval

1. Encode – get info into memory
2. Store – retain info over time
3. Retrieve – take info out of storage

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### Encoding
1. Involves attention
2. Association
3. Analysing information for meaning
4. Elaborating on details

### Attention
1. First step in the process of encoding
2. It may require conscious effort
3. Plays an important role in being able to remember
4. Activity
   a. Introduce task
   b. Participants to read story
   c. Repeat task with distraction
   d. Comments from participants

### Association
1. The way new information is encoded
2. Is done unconsciously
3. The more effort you put in the more likely your recall
4. Activity
   a. Introduce task
   b. Read difficult story
   c. Feedback from participants
   d. Read easy story
   e. Feedback from participants

Comments:
### Analysis and Elaboration

1. Analysing information for meaning and elaborating on the details are components of encoding
2. They result in deeper encoding and involve study and repetition

### Tea Break

### Storing information into LTM

1. Second component of memory
2. Number of different types of memory stores
3. Memory is organised into different networks and connections
4. Individual differences in verbal and visual memory abilities
5. Memory storage is like a complicated filing system
6. The better organised the info and filing system the easier the recall
7. Activity
   a. Introduce list learning task
   b. Review instructions
   c. Read list
   d. Participant responses

### Retrieval

1. Once we have learnt information we want to be able to retrieve if at a later stage
2. Involves getting information from LTM into consciousness
3. Accomplished by using recognition or spontaneous recall
4. Can be triggered by cues
5. Spontaneous recall is harder than recognition
6. Activity
   a. Introduce exercise
   b. Explain instructions
   c. Read passage
   d. Participants respond
   e. Comments to group

### Closing Comments

1. Review topic
2. Introduce next session
3. Thank group for their participation

### Total:

N /82  C /82  P /82  U /82
SESSION FIVE: Improving Memory in Everyday Life – Part One

Brief review of previous session topic
1. Exercise Activity
   a. Explain quiz
   b. Review answers with group
   c. Discussion regarding information in quiz

Comments:

Introduce new topic

Address other possible causes of memory difficulties
1. Failure to enter into the memory bank
2. Interference effects
3. Limited associations
4. The need for cues
5. Memories fade
6. Being mindful of psychological and health factors

Comments:

Maintaining a positive attitude about memory
1. Important to keep a positive and open mind
2. Changing your attitude can play a role in your ability to remember
3. If you tell yourself you won’t be able to remember information, you likely won’t concentrate on it and will forget it
4. A positive attitude is the first step towards a better memory

Comments:
Reviewing the Basics
1. Need to make an effort to remember things
2. The brain prioritises information
3. Motivation and personal relevance will influence recall
4. Be mindful of the amount of info you are trying to recall
5. It can be difficult to remember all details
6. Be selective in what you are trying to learn
7. Activity
   a. Instructions for story presentation
   b. Review questions
   c. Read story
   d. Review responses
8. Organisation of information
9. Activity
   a. Instructions for word list recall
   b. Present list
   c. Responses from participants

Tea Break

Discussion regarding depth of processing
1. The deeper you process information the more likely you will be able to retain it
2. Deeper processing involves rehearsing, elaborating and associating
3. Rehearsal involves repetition
4. Elaborating involves tasks like visualisation
5. Associating involves relating info with something you already know
6. Activity
   a. Discuss visualisation
   b. Talk group through an example
   c. Comments/Responses from group
7. Association is the process of making mental connections
8. Association is an excellent strategy for encoding new information
9. Associations are useful for remembering different types of things
10. Activity
    a. Talk group through an example
    b. Comments/responses from group

Comments:
Closing Comments

1. Trying to remember new information takes effort and practice
2. Selectively think about what you want to recall and put in conscious effort to use strategies
3. We will continue to practice these strategies in coming sessions
4. Review word list
5. Thanks to group for their participation

Comments:

Total: N /48  C /48  P /48  U /48
SESSION SIX: Improving Memory in Everyday Life Part Two

Objectives:

Brief review of previous session topic
1. Exercise Activity
   a. Explain quiz
   b. Review answers with group
   c. Discussion regarding information in quiz

Comments:

Introduce new topic

Using Strategies in Everyday settings
1. The more you practice strategies the more automatic they will become
2. Visualisation is the process of consciously creating an image in your mind of a task, number, a name, word, or thought
3. Stop and think about an object when you put it down
4. Association is the process of forming a mental connection
5. The more you consciously try to remember something the easier it will be to recall
6. Activity
   a. Introduce activity
   b. Instructions for task
   c. Present word pairs
   d. Responses from participants

Comments:

Tea Break
Review word pairs
1. Activity
   a. Introduce activity
   b. Instructions for task
   c. Present word pairs
   d. Responses from participants

Comments:

Review importance of Selective Attention
1. Selective attention refers to the ability to be attentive to whatever you choose
2. Given example of going to the movies and recalling details of film
3. The more analysis you undertake the better your recall
4. Select and choose to focus on what you want to remember
5. What you focus on and analyse should be easier to recall
6. Activity
   a. Introduce activity
   b. Instructions for task
   c. Present story
   d. Responses from participants

Comments:

Review additional memory strategies to be incorporated in the home and daily routine
1. Practice is a key component in memory tasks
2. Write it down
3. Have set places for things
4. Repeat Information
5. Make associations
6. Use triggers

Comments:
**Take Home Messages**
1. Choose something specific you want to remember
2. Review the techniques
3. Try the technique
4. If it doesn’t work, try something else
5. Don’t feel defeated if some things are difficult to recall
6. Activity  
   a. Introduce task
   b. Responses from group

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1. Thank group for participation
2. Reinforce use of strategies
3. Introduce next session

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SESSION SEVEN: Back To Basics

Objectives:

Introduce session outline

Review Home Strategy Suggestions/Group Discussion
1. Write things down
2. Group Responses
3. Use set places for Items
4. Group Responses
5. Repetition, Association, Triggers
6. Group Responses

Comments:

Review previously learnt word pairs
1. Introduce task
2. Group Responses

Comments:

Review of attention, processing speed, executive functions
1. Review changes in attention-processing speed and impact on memory
2. Mention executive functions and role played in memory
3. Activity demonstrating the use of these abilities
   a. Introduce task
   b. Read paragraph
   c. Participant Responses
   d. Comments

Comments:
Tea Break

Activity
1. Introduce task
2. Read list of words to group
3. Participant responses
4. Group Comments

Comments:

Activity
1. Introduce task
2. Read story to group
3. Participant responses to questions
4. Group Comments

Comments:

Activity
1. Introduce task
2. Present visual pairs to group
3. Participant responses
4. Group Comments

Comments:

Closing Comments
1. Thank group for participation
2. Introduce next session

Comments:

Total: N /30 C /30 P /30 U /30
### Introduce session outline

**Ageing and language skills**

1. Changes in our language abilities are slight though become more apparent after the age of 70
2. Definition of the Tip of the Tongue Phenomenon
3. TOT first examined experimentally in the 60s
4. Activity
   a. Introduce task
   b. Group shown pictures
   c. Group respond to pictures

### Definition of semantic memory

1. There are many different types of memory systems in the brain
2. Semantic memory is the pool of information acquired over a lifetime
3. It accumulates with age
4. TOT may not be a problem with memory but with efficient retrieval

### Review of strategies for word finding difficulties

1. Relax and think of related items
2. Don’t be impatient
3. Start a word list
4. Practice activities that challenge word knowledge

Comments:
### Language Activity
1. Introduce proverb completion task
2. Explain instructions
3. Participants complete task
4. Group responses

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Comments:

### Language Activity
1. Introduce crossword task
2. Explain instructions
3. Participants complete task
4. Group responses

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Comments:

### Tea Break
N C P U

### Language Activity
1. Introduce word generation task
2. Explain instructions
3. Participants complete task
4. Group responses

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Comments:

### Language Activity
1. Introduce vocabulary definitions task
2. Explain instructions
3. Participants complete task
4. Group responses
5.

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Comments:
Language Activity
1. Introduce paragraph reading and comprehension questions  N    C    P    U
2. Explain instructions  N    C    P    U
3. Participants complete task  N    C    P    U
4. Group responses  N    C    P    U

Comments:

Language Activity
1. Introduce category fluency task  N    C    P    U
2. Explain instructions  N    C    P    U
3. Participants complete task  N    C    P    U
4. Group responses  N    C    P    U

Comments:

Language Activity
1. Introduce picture naming task  N    C    P    U
2. Explain instructions  N    C    P    U
3. Participants complete task  N    C    P    U
4. Group responses  N    C    P    U

Comments:

Closing comments
1. Thank participants for attending/taking part  N    C    P    U
2. Reiterate where they can find language activities  N    C    P    U
3. Introduction of next session  N    C    P    U

Comments:

Total:  N    /47  C    /47  P    /47  U    /47
SESSION NINE: Maintaining the Mind and Sharpening the Tools

Introduce session outline

Discussion of strategies for keeping mentally fit
1. Discussion of “Use it or Lose it”
2. Diet
3. Exercise
4. Sleep hygiene
5. Mood and psychological issues
6. Mental activity

Comments:

Review memory strategies
1. Use of memory notebook
2. Organising the home environment
3. Adopting external aids (eg. calendars, white boards etc)
4. Repetition, Visualisation, Association
5. Activity
   a. Introduce task
   b. Provide instructions
   c. Read word pairs to group
   d. Group response
   e. Encouragement regarding participation

Comments:

Tea Break
Activity

1. Introduce task
2. Provide instructions
3. Read word pairs to group
4. Group response
5. Encouragement regarding participation

Comments:

Activity

1. Introduce story recall task
2. Provide instructions
3. Group response
4. Encouragement regarding participation

Comments:

Activity

1. Introduce word list learning task
2. Provide instructions
3. Read word list to group
4. Group response
5. Encouragement regarding participation

Comments:

Closing comments

1. Thank group for participation
2. Introduce next session

Comments:

Total: N /33  C /33  P /33  U /33
**SESSION TEN: Final Review and Take Home Message**

### Introduce session outline

- NCPU

### Review concept of attention

1. Discuss strategies to improve attention
   - a. Minimise fatigue
   - b. Minimise distraction
   - c. Avoid multitasking
   - d. Be organised

### Review processing speed

1. How does processing speed influence memory
   - a. Slower to process information
   - b. Trouble processing large amounts quickly

2. Strategies to enhance processing speed
   - a. Reduce time pressure
   - b. Repetition
   - c. Practice

### Review executive functions

1. Definition
2. Strategies to utilise executive functions

**Comments:**

- NCPU

- NCPU

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<td>a. Introduce task</td>
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<td>c. Group response</td>
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<td>d. Encouragement regarding participation</td>
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<th>Review memory</th>
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<td>1. Define STM</td>
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<td>2. Define LTM</td>
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<td>3. Mention encoding, storage and retrieval</td>
<td>N</td>
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<td>4. Discuss rehearsal and elaboration</td>
<td>N</td>
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<td>5. Discuss external strategies</td>
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<td>6. Review Visualisation, Association, Repetition</td>
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<td>c. Present task to group</td>
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<td>d. Group response</td>
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Comments:
**Activity**

a. Introduce memory task
b. Provide instructions
c. Present task to group
d. Group response
e. Encouragement regarding participation

**Review language**

1. Define Tip of the tongue phenomenon
2. Strategies for TOT phenomenon
3. Activity
   a. Introduce word challenge task
   b. Provide instructions
c. Group response
d. Encouragement regarding participation
4. Activity
   a. Introduce crossword challenge task
   b. Provide instructions
c. Group response
d. Encouragement regarding participation
5. Activity
   a. Introduce verbal fluency task
   b. Provide instructions
c. Encouragement regarding participation

**Tea Break**

**Closing comments**

1. Thank group for their participation
2. Encourage continued use of strategies and program material
3. Reminder of 6 month booster telephone call
4. Reminder of 12 month testing
5. Address any questions

**Total:** N /63 C /63 P /63 U /63
Promoting Healthy Ageing with Cognitive Exercise

The PACE Study: A Randomised Control Trial of Cognitive Activity for Older Adults with Mild Cognitive Impairment

Education Intervention

PROGRAM MANUAL TEMPLATE

Rating Key:
N = No, topic not covered
C = Topic completely covered
P = Topic partially covered
U = Unsure if topic covered
## Introduce Study

5. Welcome Participants

6. Remind of commitments required

7. Information on participant manuals

8. Review Purpose of the Research

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## Explain content of Manuals

1. Personal details in folders

2. Attendance days / Calendar

3. Participation Pledge

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## Review Behaviour Expectations

1. Confidentiality issues

2. Tea and toilet breaks

3. Problems understanding/hearing sessions

4. Discuss any concerns participants may have

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## Program Outline Provided

1. Discuss each session topic

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Comments:
Introduce group members to each other
1. Name Tags
2. Ice Breaker Exercise - Individual Introductions
3. Ice Breaker Exercise – Individual Interviews

Comments:

Tea Break

Presentation of ageing– biological and physiological changes
1. Introduce video to group
2. Brief Discussion

Comments:

Closing Comments
1. Thank group for participation
2. Introduce next session topic

Comments:

Total: N /20  C /20  P /20  U /20
SESSION TWO: Memory and Dementia

Welcome/Introduction of Session

Introduce topic of memory
1. Review of the importance of memory in day to day activities
2. Some aspects of memory tend to decline as we get older
3. Memory for past events remains preserved
4. Memories of a short term nature may be more difficult to recall

Discussion on the ageing brain
1. Ageing causes changes to the brain
2. Older adults have greater difficulty selectively attending to info
3. Multi-tasking is more difficult
4. Sustaining concentration is harder
5. Cognitive slowing occurs
6. Difficulties in attention and concentration and slowing of thought processes contributes to problems with memory

Review of normal memory problems and memory impairment associated with dementia
1. Everyone forgets things from time to time
2. Common to misplace items
3. Persistent and progressive decline in memory for people with dementia
4. These memory problems interfere with daily activities

Comments:
Defining Dementia
1. Definition
2. Progressive condition
3. Variety of Causes
4. Not a normal part of ageing
5. Age as a risk factor
6. Discussion in group of known person’s with dementia
7. Early signs and symptoms
   - Difficulty recalling events
   - Trouble making decisions/poor judgement
   - Difficulty doing routine activities
   - Difficulty understanding stories/conversation
   - Behaviour and personality changes

Tea Break

Video presentation on Alzheimer’s disease “Memory Matters”
1. Introduction to video
2. Video played

Facts about Alzheimer’s disease
1. Most common form of dementia in Australia
2. Characterised by abnormal pathology in the brain
3. Risk Factors
4. Obtaining a diagnosis
5. Putting supports in place
6. Medications

Closing Comments
1. Thank participants for attending
2. Final questions
3. Introduce next session topic

Comments:

Total: N /38 C /38 P /38 U /38
### Introduce Session
1. Traditional views on ageing and physical activity  
2. Beliefs of ancient philosophers  
3. Current views on ageing and physical activity

### Taking the first Steps
1. Personal attitudes to physical activity  
2. You can be active throughout the day in many different ways  
3. Australian Government Physical Activity Guidelines  
4. Group discussion regarding levels of activity

### Video presentation
1. Introduce video  
2. Play video

### Review benefits of physical activity
1. Prevents illness and disability  
2. Promotes independence  
3. Reduces decline in bone and muscle strength  
4. Improves heart and lung fitness and flexibility  
5. Being active reduces risk of  
   a. Heart disease and high blood pressure  
   b. Falls and injuries  
   c. Obesity  
   d. Diabetes  
   e. Osteoporosis  
   f. Stroke  
   g. Depression

### Other benefits of physical activity
1. Increased opportunity for socialisation  
2. Improved quality of life  
3. Reduced physical pain  
4. Relaxation, stress reduction and improved sleep
### Review common excuses for not exercising and barriers for starting

1. Consult your doctor
2. Physical activity will give you more energy
3. Don’t let excuses be barriers to starting a routine
4. Set some goals
5. Start with activities you know you will enjoy
6. Incorporate activities into your daily routine
7. Be active every day if you can

### Discussion about pamphlets/handouts

### Tea Break

### Introduction to Nutrition

1. Australian’s living longer
2. Nutritional problems in older adults
3. Reasons why people neglect healthy eating

### Video presentation

1. Introduce video
2. Play video

### Obtaining more information

1. Discussion of brochures
2. Introduce Nutrition Australia

### Closing Comments

1. Thank participants for attendance
2. Final questions
3. Introduce next topic
### SESSION FOUR: Stress – Causes, Effects and Management

**Introduce Session Topic**

Comments:

**Defining Stress**

Comments:

**Stress and retirement**

1. Some circumstances surrounding retirement can be stressful
2. Most people consider it a time of opportunity
3. It’s not uncommon for older adults to experience stress
4. Stress can be physical, social, sudden or chronic

Comments:

**Causes of stress**

1. Financial concerns
2. Family problems
3. Health & disability,
4. Housing issues
5. Loss & grief
6. Retirement and boredom

Comments:

**Group discussion of personal experiences**

Comments:
Review of negative effects of stress
1. Sleep difficulties
2. Physical changes
3. Mood issues
4. Cognitive problems

Comments:

Managing stress – strategies and techniques
1. Having a positive belief
2. Feelings of self confidence and personal control

Comments:

Techniques
1. Sensible coping strategies
2. Regular exercise
3. Smoking; Alcohol consumption; Diet
4. Hobbies; Social life; Volunteering
5. Learn Tai Chi or Yoga
6. Massages, hot baths or spas
7. Meditation and deep breathing
8. Listening to music or other relaxation tapes
9. Self-hypnosis
10. Counselling, therapy or support groups

Comments:

Tea Break
Anxiety
1. Worry as a normal reaction
2. Definition of anxiety disorders
3. Anxiety disorders can become more common as we age
4. Persistent or extreme anxiety reduces quality of life
5. Symptoms
   a. Tense muscles, shaking, trembling, restlessness
   b. SOB, rapid heart rate, sweating, dizziness, flushes
   c. Dry mouth, nausea, diarrhea, frequent urination
   d. Changes in normal behaviour/routines
6. Can be associated with depression, dementia, side effects of medications, or due to medical conditions
7. Diagnosis requires review by a doctor or specialist
8. Treatment consists of therapy and medication

Comments:

Demonstration of
1. Muscle tension exercise
2. Breathing techniques
3. Relaxation exercise

Comments:

Closing Comments
1. Provision of handouts
2. Thank participants for attendance
3. Introduce subject of next session

Comments:

Total: N /47 C /47 P /47 U /47
**SESSION FIVE: Depression – Causes, Effects and Management**

### Introduce Session

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### Defining Depression

1. A clinical disorder
2. Can affect anyone
3. Examples of people in hx who have suffered depression

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### Video Presentation “Understanding depression in your senior years”

1. Introduce video
2. Play video

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### Facts about depression

1. Symptoms are common
2. Depression is not a normal part of ageing
3. It’s not a passing mood or phase
4. Has many causes
5. Sometimes no cause can be identified
6. Can run in families
7. Difficult to detect in older adults
8. Greater risk if have suffered depression in early life
9. Can damage quality of life and relationships
10. Associated with increase risk of other diseases
11. Associated with suicide

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Brief Video presentations:
1. Gary McDonald
2. Patient post heart attack
3. Group Discussion

Comments:

Recognising the symptoms of depression
1. Behavioural manifestations
   a. Reduced level of activity
   b. Personal neglect
   c. No enjoyment from activities
   d. Changes on appetite/weight
   e. Restlessness/agitation
2. Physical changes
   a. Sleep patterns
   b. Lack of energy/tiredness
   c. Slowing of movements
3. Thought pattern/mood changes
   a. Feeling sad/anxious/irritable
   b. Thoughts about suicide
   c. Problems with cognition

Comments:

Tea Break

Treatments for depression
1. Medication
2. Psychological
3. Lifestyle factors

Comments:
## Risk factors for depression

1. Isolation
   - N □ C □ P □ U □
2. Nursing home/care facility
   - N □ C □ P □ U □
3. Dementia
   - N □ C □ P □ U □
4. Physical health conditions
   - N □ C □ P □ U □
5. Admission to hospital
   - N □ C □ P □ U □

### Comments:


## Seeking help for depression

1. GP
   - N □ C □ P □ U □
2. Psychologist/Psychiatrist
   - N □ C □ P □ U □
3. Help Lines
   - N □ C □ P □ U □
4. Hospital
   - N □ C □ P □ U □

### Comments:


## Closing Comments

1. Review Beyond Blue Handouts
   - N □ C □ P □ U □
2. Thank for participation
   - N □ C □ P □ U □
3. Final questions
   - N □ C □ P □ U □
4. Introduce next session topic
   - N □ C □ P □ U □

### Comments:


## Total:

- N /48
- C /48
- P /48
- U /48
SESSION SIX: Sleep Changes in the Older Adult

Introduce Session
1. Overview of problems of disturbed sleep
2. Video footage
3. Research on disturbed sleep in older adults in WA

Comments:

Why is Sleep so Important?
1. Cognitive
   a. Memory/learning
   b. Judgement/Decision Making
   c. Affect on daily functioning
2. Mood Enhancement and social behaviours
3. Immune system and general health

Comments:

Discussion of Stages of Sleep
1. Normal changes as we age
   a. Lighter more interrupted sleep
   b. Sleep less hours
   c. Might need to wake up to use the toilet
2. Stage 1 Drowsiness
3. Stage 2 Light Sleep
4. Stage 3 & 4 Deep Sleep
5. REM Sleep

Comments:
Defining sleep problems
1. Trouble initiating sleep
2. Difficulty resuming sleep
3. Daytime tiredness/fatigue
4. Snoring/breathing problems
5. Restlessness

Comments:

Recognising factors that might negatively influence sleep
1. Changes in routine/environment
2. Psychological/Emotional issues
3. Medications and insomnia
4. Pain and Illness
5. Sleep Apnoea and periodic limb movements
6. Cola/tea/Coffee/Nicotine/Alcohol

Comments:

Tea Break

Discussion of ways to improve sleep using medication
1. Introduce sleeping tablets
2. Negative effects of sleeping tablets
3. Tolerance
4. Withdrawal
5. Side effects

Comments:
Discussion of ways to improve sleep by making lifestyle changes

1. Good sleep hygiene practices
   a. Regular sleep-wake cycles
   b. Check sleep environment
   c. Wind down
   d. Use bed to sleep
   e. Avoid worrying in bed
   f. Be mindful of the effects of alcohol/caffeine
   g. Avoid excessive eating
   h. Regular physical activity
   i. Practice relaxation techniques

2. Keep a sleep diary

Comments:

Closing Comments

1. Thank participants for attendance
2. Final questions
3. Introduce next topic

Comments:

Total: N /45 C /45 P /45 U /45
SESSION SEVEN: Older but not “Old”

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<th>What is the meaning of “old age”?</th>
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<td>1. Discuss concept of old age in western society</td>
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<td>2. Emphasis in modern society on technology and preservation of cognition</td>
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<td>3. Present video footage on ageism in the workforce</td>
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<td>4. Group discussion</td>
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<th>Challenging cognitive perceptions of the older adult</th>
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<td>1. Age is a ‘state of mind’</td>
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<td>2. Dr. F. W. Sunderman</td>
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<td>3. Video clip presentation</td>
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<td>4. Introduction of newspaper articles</td>
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<td>5. Group Discussion</td>
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Volunteering
1. Definition of a volunteer
2. Review statistics and brief facts on volunteering
3. Discuss benefits of volunteering
   a. To the community, economy and individual
4. Opportunities provided by volunteering
   a. Develop knowledge and skill
   b. Involvement in local community
   c. Make a difference
   d. Stay active
5. Volunteering increases social cohesiveness and spirit

Comments:

Tea Break

Discuss types of volunteer activities
1. Common examples
2. Participation in research
3. Other general examples
4. Community activities
5. Local neighbourhood activities
6. Group discussion on personal experiences of volunteering

Comments:

Deciding if Volunteering is right for the individual
1. How many hours a week spent on other activities
2. How much free time
3. Opportunities from volunteering
4. Volunteers are of different ages/cultures/ability

Comments:
Obtaining more information about volunteering

1. Volunteering WA
   a. Aims of organisation
   b. Information sessions
   c. Contact details

2. Contact details south of the river

Comments:

Closing Comments

1. Thank for participation
2. Final questions
3. Introduce next session topic

Total: N /37 C /37 P /37 U /37
### Introduce Session

Comments:

### Definition of Retirement

Comments:

### Implications of retirement (positive and negative)

1. Retirement has implications for identity
2. Can be associated with positive and negative emotions
3. Taking on the role of grandparent
4. Spending more time with your spouse
5. Relationship conflicts
6. Physical limitations
7. Group discussion

Comments:

### Involvement in different levels and types of activities

1. Daily routine and activities add purpose to life
2. Important to strike up a balance with level of activity

Comments:
Discussion of different types of activities/opportunities in retirement

1. Volunteering
2. Physical activity
3. Hobbies
4. Continuing Education
   a. Further study
   b. University of the third age
   c. Group Discussion

---

Tea Break

---

Discussion about travelling in retirement

1. Vacation destinations
2. Health and medical issues
3. Making the most of the trip
   a. Jetlag
   b. Planning itineraries
   c. Seniors cards
   d. Safety/thieves
4. Group discussion of recent travel exploits

---

Comments:
Discussion regarding the health benefits of having a pet
1. Some people may find that having a pet can assist with loneliness
2. Scientific research has found benefits associated with owning a pet
3. Issues to consider when purchasing a pet
   a. Level of care required
   b. Cost
   c. Allergies
   d. Volunteering at a shelter
   e. Group discussion

Comments:

Closing Comments
1. Thank participants for coming along
2. Any questions
3. Introduce next session topic

Comments:

Total: N /35 C /35 P /35 U /35
### Introduce Session

N C P U

### Safety in the Home

#### 1. Fire Safety Tips
- a. Escape routes
- b. Smoke alarms
- c. Heaters
- d. Cooking caution
- e. Putting out flames
- f. Avoiding smoke inhalation

#### 2. Home Security
- a. Spare keys
- b. Shrubbery
- c. Secure meter box
- d. House number visible
- e. Leave outside lights on
- f. Phone in bedroom
- g. Mark property and keep inventory
- h. Deadlocks and peepholes
- i. Know your neighbours

#### 4. Personal Security in the Home
- a. Be mindful of people who come to the front door
- b. Pretend someone is home
- c. Turn lights on
- d. Be careful on the telephone
- e. Dealing with intruders

#### 5. Personal Security in the Street
- a. Carrying valuables
- b. Be mindful when out walking and be observant
- c. Public transport and driving safety

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### Tea Break

N C P U
Making Provisions for Medical Emergencies
1. Creating an information sheet
   a. Names of doctors
   b. Your birth date
   c. List of allergies
   d. Major medical problems
   e. Current medications
   f. Prior surgical history
   g. Lifestyle information
   h. Religious beliefs

Planning for the Future: Wills
1. Important facts about Wills
   a. Dying intestate
   b. Ensuring property distributed according to wishes
   c. Sentimental items
   d. Marriage and wills
   e. Divorce and wills
   f. De facto partners
   g. Planning funerals
   h. Appointing an executor
   i. Seek legal advice

Planning for the Future: Powers of Attorney and Guardianship
1. Power of Attorney
   a. Definitions
   b. General power of attorney
   c. Enduring power of attorney
   d. Choose carefully someone you can trust
   e. Person is required to act in your best interest
2. Guardianship
   a. Definitions/Terminology

Group Discussion

Obtaining more information

Comments:
**Closing Comments**

1. Thanks for attendance/participation

2. Introduce next session topic

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| Total:   | N /54 | C /54 | P /54 | U /54 |
SESSION TEN: Review and Close

Introduce Session

Review Session One and Two

Review Session Three

Review Session Four

Review Session Five

Review Session Six

Review Session Seven

Review Session Eight

Review Session Nine

Tea Break

Closing comments

Reminder regarding post intervention testing

Reminder regarding booster calls

Comments:

Total: N /13 C /13 P /13 U /13
PROMOTING HEALTHY AGEING

WITH COGNITIVE EXERCISE

THE PACE STUDY

A RANDOMISED CONTROLLED TRIAL OF COGNITIVE ACTIVITY

IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT

MANDY VIDOVICH

BSc, Hons, M Clin. Neuropsych

THIS THESIS IS SUBMITTED FOR THE DEGREE OF

Doctor of Philosophy

THE UNIVERSITY OF WESTERN AUSTRALIA,

School of Psychiatry and Clinical Neurosciences &
The Western Australia Centre for Health and Ageing

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VOLUME 2
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The PACE Study: A Randomised Control Trial of Cognitive Activity for Older Adults with Mild Cognitive Impairment

Cognitive Activity Intervention

PROGRAM MANUAL
# PROGRAM MANUAL: Cognitive Activity Intervention

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SESSION ONE:
INTRODUCTION
SESSION ONE: Introduction

Objectives:

☐ Introduce Study

☐ Explain content of Manuals

☐ Review Program Outlines

☐ Introduce group members to each other
  ☐ Name Tags
  ☐ Ice Breaker Exercise

☐ Tea Break

☐ Name Game

☐ Interview Exercise
  ☐ Quiz for recall of group member information

☐ Introduce next session topic
1. Welcome

- Welcome everybody and thank you for volunteering your time to participate in our new, exciting and innovative research study.

- As you know, this study is a joint collaboration between Royal Perth Hospital, the University of Western Australia and the Centre of Excellence for Alzheimer’s Disease Research and Care.

- My name is Mandy and I’m going to be running each of the sessions over the next ten weeks with you. I am a Clinical Neuropsychologist and work for Royal Perth Hospital.

- By now you would have all completed the first phase of the study, which was the baseline assessment of your memory and other aspects of your thinking.

- We are going to begin the second phase of the study today.

- For the next five weeks, you will be invited to attend every (insert day) at (insert time) to participate in approximate 90-minute sessions covering a variety of ways to improve your cognition.

- I am going to provide each of you with a Manual which is yours to keep. At the beginning of each session, I will provide you with handouts on the material we are going to cover. You are welcome to write in the manuals and on the handouts, as you will not need to give them back at the end of the study.

- You will recall that the purpose of this study is to determine whether cognitive activity can improve memory. You have all been randomly selected to participate in the cognitive activity component of this study. At present, there is no conclusive evidence regarding the benefits associated with mental activity and its impact on memory. This program, which will teach you about strategies to improve aspects of your thinking and which incorporates different types of mental activities, has been designed to investigate this issue.
Session One: Introduction

- If you all open to the front section of your manual, you will find a space to insert your name and contact details should you misplace or lose your folder.

- The next couple of pages provide details regarding the study and contact information if for any reason, you want to contact the research team. For example, if you are sick or unable to attend one of your sessions.

- You will also find a space for you to fill in the day and time that you are attending your sessions each week. There is also a calendar that you can use to mark each of the days you attend.

- In order to make this research a positive experience it is important that we try to respect each other. In this regard, some rules might be helpful. These are set out in the “Participation Pledge” (Review Rules).

SEE NEW SLIDE

- Additionally, any personal information that is discussed during the sessions is to remain confidential. Whilst you are free to discuss the material presented in the sessions, if I invite you to talk about personally relevant experiences, I would ask you all to keep that information confined to the session.

- If at any time you feel that you need a break, for example to go to the bathroom; please feel free to leave the room and use the designated toilets at the other end of the hall.

- If at any stage you feel distressed or uncomfortable for any reason, please let me know.

- I am also happy to repeat any information or answer any questions as we go along. Interrupt me if there is something that you mishear or have difficulty understanding.

- Tea breaks will be scheduled in the middle of each session and you will be provided with tea, coffee, juice and biscuits/cake.
2. Program Outline

- Let’s review the topics of information we are going to cover over the next nine weeks. The titles of these are outlined in your manual.

- In session two “The Ageing Brain – Part One” we are going to discuss the term “cognition” and how these processes change as we get older. We will define attention and processing speed, complete exercises demonstrating these abilities and look at strategies for maintaining these skills.

- The third session will be devoted to looking at another cognitive domain called executive functions. Again we will look at how these abilities change as we get older, how they influence memory and the strategies we can use to enhance these skills.

- Sessions four through to six will be spent studying memory, and reviewing strategies to improve memory functioning.

- Session seven “Back to Basics” will be spent practising some of the strategies we learn, before we move on to complete session eight and look at ageing changes to our language abilities.

- The final sessions, nine and ten will be used to review the material we have learnt and discuss ways of practically incorporating activities in your everyday life.

- I will be providing you with a new set of notes for each session you attend. These notes will contain summaries of the information that is presented on each topic.

- For the success of this research project it is very important that you try to attend each of the program sessions. Even if you feel that some of the sessions may be covering issues you are already very familiar with; by coming along you can share your experiences and knowledge with other members of the group.

- Does anyone have any questions so far?
3. **Group Familiarity**

   **SEE NEW SLIDE**

   - Given that we are going to be spending time together over the next nine weeks, let’s start to get to know each other a little better.
   - I’m going to ask each of you to create your own nametag.
   - Please wear your badge during each of the sessions.

   **SEE NEW SLIDE**

   - Now, let’s go around the group. I’d like each person to introduce himself or herself by saying their first name; their reasons for volunteering in the study and any expectations they have regarding the study. I’ll go first.
   - My name is Mandy, and I am undertaking this research as part of my University degree. I hope that you will all find the information I present in each of the sessions interesting and thought provoking and that you will openly discuss your own experiences when I ask for your opinions on the different matters we cover.
   - Perhaps, *(insert group member name)*, you could go next and we’ll continue moving around to the left, with *(insert group member name)* following after you and so on.
   - Excellent, well done everyone. Let’s have a ten minute tea break.

4. **Tea Break**

   **SEE NEW SLIDE**

5. **Name game around group**

   - Now we are going to go around the group one at a time.
   - Each person is to say their name and their favourite food and to recall the name and favourite foods of the person/s before them (eg. My name is Eric and I enjoy eating grapefruit; Margarie enjoys Ribena, John enjoys lollies and Glen enjoys plums etc.
   - Just do the best that you can; this is not meant to be competitive or to make you feel uncomfortable. If you have trouble or forget; we can jump in to help each other.

6. **Interviews**

   - Now we are going to divide into groups of two/three and to interview each other using a prepared handout.
   - After we have spent 10 minutes talking to each other you are then going to introduce the details about your group members to the rest of the group.

**1.1 GROUP EXERCISE ACTIVITY:**
Facilitator to divide up group and hand out sheets. Group Members to take ten minutes to record details about each other.

**1.2 GROUP EXERCISE ACTIVITY:**
Each person to present on someone in their group.
Now that we have introduced ourselves to each other, let’s look at our memory for the information we have just been presented and see how well we can remember the interesting things we just learnt about each other.

**1.3 GROUP EXERCISE ACTIVITY:**
Short quiz compiled by facilitator on group presentations to test memory/recall of facts about participants.

- Well done everyone.
- If you found it difficult to remember some of the details about the people in the group, don’t feel alarmed. We are going to learn ways of remembering these sorts of details over the course of this program.
- Additionally, we will discuss the types of factors that may influence our memory abilities and how to best manage these issues.

7. **Closing**

- Let’s leave it there for today.
- Thank you all for attending.
- Next week we are going to start our program more formally. We will talk about how aspects of our thinking change as we get older and start discussing the strategies we can use to compensate for these changes.
- See you all next week.
SESSION TWO:

THE AGEING BRAIN:

Is it Really a Memory Problem?

Part One
SESSION TWO: The Ageing Brain: Is it Really a Memory Problem?
Part One

Objectives:

☐ Warm Up Exercise

☐ Introduce Session Topic
   ☐ Discuss the term cognition and how these processes change with aging

☐ Introduce “attention” as cognitive construct
   ☐ Complete exercises demonstrating the role of attention
   ☐ Review strategies for improving attention

☐ Tea Break

☐ Introduce “processing speed” as cognitive construct
   ☐ Complete exercises demonstrating the role of processing speed
   ☐ Review strategies for improving processing abilities

☐ Summarise and Review new concepts
   ☐ Complete group exercise activities demonstrating new concepts

☐ Introduce next session topic
1. Welcome/Introduction to Session

- Thank you for attending today’s session.
- Here is a copy of the material being covered in today’s session.
- Today we are going to explore issues related to some of the changes that occur naturally to our thinking as we age.
- Firstly, let’s try a warm-up exercise to start stimulating our minds.

2. Warm Up - Name game around group

**SEE NEW SLIDE**

- Instructions: We are going to go around the group, one at a time and perform the same exercise we did last week.
- Once again, each person is to say their name, but this time, instead of saying your favourite food, I would like you to say your favourite past time.
- Like before you will need to recall the name and past time of the person/s before you (eg. My name is Eric and I enjoy soccer; Margarie enjoys walking her dog, John enjoys reading and Glen enjoys playing cards etc.
- Just do the best you can; it’s not meant to be competitive.
- This exercise is just another way for us to learn something about each other and to start thinking and concentrating. Again, if you find you are having trouble, members of the group can jump in to help.

**SEE NEW SLIDE**
3. The Ageing Brain

- All right, now that we have warmed up a little, let’s start by discussing how aspects of our thought processes change as we get older.

- As we age there are a number of natural changes that occur across aspects of our cognition.

- The word “cognition” – refers collectively to aspects of our mental functions such as the ability to think, reason and remember.

- Just as aspects of our physical functioning become less agile as we get older, so do aspects of our thinking.

- Much research has confirmed that as we age certain changes occur in our ability to learn new information.

- Older adults tend to require more time to learn new information.

- Older adults need to put in greater effort to absorb new information, for example.

  - Attending more and

  - Organising information more efficiently.

- Older adults may also notice inconsistencies in what they can remember, for example

  - Short term memory becomes worse eg. remembering what we ate for breakfast yet

  - Long term memory remains relatively stable eg. remembering things we did 10 years ago such as holidays we went on.

- As we get older, we also process information at a slower pace.

  - Essentially it takes longer to figure things out and to act on it. The more complicated the material, the slower the processing.

  - Positively, although you may be slower to respond or react, research has also shown that you are likely to be more accurate than your younger counterparts.
4. Introduce focus for today’s session

- Whilst we are going to spend a number of sessions looking at memory and ways to improve memory abilities, firstly we are going to look at cognitive factors that can influence our ability to learn and remember new information.

- These important areas of cognition are attention/concentration, processing speed and a domain referred to as executive functions. Executive functions include a range of abilities, though we will be focusing only on planning and organisation, time management and use of strategies.

5. Attention

SEE NEW SLIDE

- Problems with memory can actually be due to problems with attention.

- As we get older, it becomes increasingly difficult to attend to competing activities, thoughts or conversations.

- Distractions such as a radio playing, someone talking or a doorbell ringing may disrupt concentration more as we get older.

- We have all experienced the situation whereby we go into a room and forget what we went in there for. This is likely to be caused by a problem with attention, rather than a problem with memory. At the time of going into the other room, you may have become distracted by another thought, or you weren’t adequately focussed on what you were doing in the initial instance.

- We are going to try an activity now that demonstrates the idea of divided attention – trying to attend to or mentally manipulate two competing pieces of information.

SEE NEW SLIDE

2.1 GROUP EXERCISE ACTIVITY: Divided Attention

- That was challenging and is a good example of how trying to do multiple things at once makes it difficult to concentrate on any one thing. Let’s try another example.

SEE NEW SLIDE

2.2 GROUP EXERCISE ACTIVITY: Divided and Sustained Attention
You can see that these two exercises were good examples of how quite simple everyday activities can be made more complicated and difficult by introducing distracting information or intrusions.

This can be related to your everyday activities. You will likely find it difficult to try to complete multiple tasks at once and attend carefully to what you are doing. If you have trouble attending to information, you will not remember it.

5. Strategies to improve attention

SEE NEW SLIDE

There are a number of things you can do to improve your attention.

NEXT

Firstly, your level of alertness and ability to respond to the environment will be influenced by your level of fatigue.

Therefore, if there are complex activities you need to complete (eg. filling out tax forms), this should be undertaken at a time when you feel most alert. Some people work best first thing in the morning; others feel they are more alert in the evening. Determine what suits you best.

NEXT

Minimise the amount of distracting stimuli around you (eg. if you are reading an important document or difficult novel, take the telephone off the hook). When driving, turn the radio off, as this can be a source of distraction. If you are travelling with a passenger, you might also find it useful to ask them not to talk whilst you are driving, as this can be a further source of distraction.

NEXT

If there are lots of activities you need to complete, it helps to make a list. This will assist you to work through each activity, one at a time, and prevent you from becoming distracted by thoughts related to the other things you are planning on doing.

SEE NEW SLIDE

6. Tea Break

Let’s have a tea break and then move on to talking about processing speed.
7. Processing Speed/Reaction Time

SEE NEW SLIDE

- As already mentioned, as we get older, it becomes harder to process information at the same pace as we once did and you may need longer to think about information and react to it.

SEE NEW SLIDE

- Importantly, the more familiar you are with a subject, the quicker you will be to react (e.g., playing chess; reading a novel on a familiar topic as opposed to something new).

- Let’s try an activity which is an example of the types of measures used to look at processing speed.

SEE NEW SLIDE

2.3 GROUP EXERCISE ACTIVITY: Processing speed task

8. Strategies to cope with reduced processing speed

SEE NEW SLIDE

- There are a few simple things you can do to try to accommodate changes in processing speed.

SEE NEW SLIDE

- You should try to reduce time pressures associated with activities. Plan ahead so that you will not be forced to rush. Rushing increases stress and leads to mistakes.

SEE NEW SLIDE

- If someone is explaining a new topic and you are having trouble keeping up, ask questions to clarify the presented information. This will allow you time to gather your thoughts, increase your attention and provide additional time to process the new information.

SEE NEW SLIDE

- Practice, practice, practice. The more familiar you are with information or a task, the less demands will be placed on your processing capacity.

SEE NEW SLIDE

- Let’s do the same activity we performed earlier on and see if we can now complete the task more quickly, given that you are familiar with it.

2.4 GROUP EXERCISE ACTIVITY: Processing Speed Task

Congratulate group on their improved performance time. Re-inforce the issue of familiarity and practice.

SEE NEW SLIDE
9. Review

- Let’s review some of the key issues we have talked about so far.
- Remember that poor memory can often be the result of poor attention.

NEXT

- What were some of the things we discussed that can affect attention?

(possible answers: distraction; poor concentration; time pressures)

NEXT

- How can we ensure we get the most out of the information we are trying to attend to?

(minimise fatigue, minimise distractions, make lists)

NEXT

- Keep in mind also that any sensory difficulties, such as problems with hearing or vision was also affect attention and processing abilities.

10. Exercise activities

SEE NEW SLIDE

- Let’s finish up with an exercise activity incorporating some of what we have learnt today.

2.5 GROUP ACTIVITY:
Card sorting task

2.6 GROUP ACTIVITY:
Card sorting task

11. Closing

SEE NEW SLIDE

- Thank you for attending today.

- Next week we are going to talk about executive functions, which you will recall included a range of abilities.

- We will focus on planning, organisation, time management and strategy use.

- We will also explore how these and other factors might impact on memory and what we can do to maximise our memory abilities.
SESSION THREE:

THE AGEING BRAIN:

Is it Really a Memory Problem?

Part Two
SESSION THREE: The Ageing Brain: Is it Really a Memory Problem?
Part Two

Objectives:

- Brief review of previous session topic
- Introduce cognitive construct of executive functions
  - Provide examples of executive processes
  - Complete group activity outlining the influence of executive processes on memory
  - Construct Manuals/Notebooks
- Tea Break
- Discuss non-cognitive factors that could be influencing memory
  - Psychological factors
  - Health factors
- Summarise and Review new concepts
  - Examples of executive functions
  - Strategies for overcoming problems in executive functioning
  - Influence of lifestyle factors on memory
- Introduce next session topic
- Review instructions for homework exercise
1. **Brief review and introduction to new session topic**

   SEE NEW SLIDE

   - Last week we spent some time talking about the importance of attention and concentration and how this can affect our ability to remember things.
   - We also discussed the fact that as we get older, the rate with which we are able to think about and manipulate new information, is reduced.
   - Collectively, poor attention and taking longer to process details can make it harder for us to remember new information.
   - Today we are going to learn about the importance of executive functions and how this can influence memory.
   - Here is a copy of the material being covered in today’s session.

2. **Executive Functions**

   - As mentioned last week, executive functions include a range of abilities, though we will be focussing only on planning and organisation, time management and the use of strategies.
   - An old military adage is relevant here…“Those Who Fail to Plan, Plan to Fail”
   - Effective planning and organisation, structure and routine play a key role in memory functioning.
   - If activities are performed in a systematic way, following a well thought out plan, then steps are less likely to be forgotten (eg. baking a cake).
   - Further, the more organised you are with aspects of your daily routine, the less reliance you will place on your memory.
   - Let’s try an exercise activity that demonstrates these ideas.
3.1 GROUP EXERCISE ACTIVITY:  
Instruction Recall

- Let’s try another example of this type of activity.

SEE NEW SLIDE

3.2 GROUP EXERCISE ACTIVITY:  
List Recall

SEE NEW SLIDE
3. Utilising the “Executive” in Me

Let’s discuss other strategies utilising our executive processes.

When making appointments, also make notes of these details in a set place.

Don’t rely on scrap bits of paper. Keep an A4 diary by the phone so that you can immediately pencil things in. Transfer and check this information each night in a smaller diary that you can carry in your pocket or handbag. *(Show examples of diaries).* Who of you already practises this technique?

There are many benefits to using a diary and it is very easy to incorporate their use into your everyday routine. If you get into a regular habit of checking and writing things immediately in your diary, you’ll place less pressure on yourself to remember appointment details, and free your mind to focus on other things.

Some people will find it helpful to transcribe important information from their old diary into their new one at the start of every year, this will help with birthdays, anniversaries, remembering previously important events such as operations etc.

Calendars, wall charts, white boards etc. by the phone or in prominent places are also important and very useful. Use stickers or symbols to mark important information, such as the recycling bin days.

Complete activities straight away, rather than putting them off and having to rely on memory later on. Keep a notebook handy; small pocket size books can be bought. You might want to keep one by the bed or in your car.

Write important questions down; eg. if going to the doctor, write a checklist of the things you need to ask. Practice this technique also if you are speaking on the telephone to someone unfamiliar regarding facts or information you are trying to attain.

Get into the habit of having routines for certain activities. Eg. Take your medications at the same time, in the same place each day. Use a checklist or organise for your pharmacist to provide you with a dosette box or blister pack.

Keep objects in set places and always return items after you have finished using them. You might place a dish on a sideboard near your front door that contains keys. Reduce clutter.

If there are items you need to take with you to an appointment for example, place these in a place where they will be in obvious sight, eg. in front of the front door.

File all important documents straight away and have a designated draw that you keep this information in.
Another helpful activity is to create a memory notebook that you keep important information in.

3.3 GROUP EXERCISE ACTIVITY: Memory Notebook

Let’s have a break and then move on to talk about some of the other factors that might influence memory.
5. What Other Factors Are Influencing My Memory?

- It is important to recognise the factors in your day to day functioning that might be affecting your memory. Some of these may be things you have never really considered, and some are easier to change than you may have realised.

- **Psychological Factors**
  - When we are upset it is hard to concentrate and you may not realise the effect mood symptoms such as depression, grief, anxiety and stress can have on your memory.
  - Most of the time the memory difficulties associated with mood changes are reversible once the psychological factors are dealt with.
  - Older adults tend to be more pessimistic, than younger individuals about their ability to remember.
  - Negative attitudes will cause people to put less effort into remembering, avoid tasks that require memory and feel anxious when their memories are tested in daily life. Be conscious of self defeating thoughts. If you say to yourself “I won’t possibly be able to remember that” or “I’m too old to learn new things” chances are you will have trouble.

- A lack of mental stimulation, social interaction and physical activity can also influence memory abilities.

- **Health Issues**
  - Physical Illness and certain medical conditions can cause reversible changes in memory functions.
  - Some Medications can slow thinking, make you feel drowsy/foggy and diminish attention/concentration. This can be over the counter medications (eg. cold and flu tablets) and not only ones prescribed by your doctor.

- Sensory Losses - Vision and hearing difficulties will influence the accuracy of the information you try to process to remember. You may not see or hear something completely and therefore won’t remember it accurately. Sensory disturbances will distort the information you are processing.

- Fatigue - It is much harder to pay attention to things and to try to remember something if you are tired. Your memory will not be as sharp if you are not feeling well rested and alert. Don’t put pressure on yourself to remember information if you are tired; this will only lead to frustration. Take a walk or have a rest, though be mindful of altering your sleeping habits.
· **Alcohol** - Many people find that they are less able to tolerate alcohol as they grow older.

· **Poor Nutrition** - Eat a variety of foods to maintain a well balanced diet.
6. Review

- Let’s review the ideas that we talked about in today’s session.

  - Firstly, what do we mean when we use the term executive functions?
    
    \[ \text{Answer: “A range of abilities; planning and organisation, time management and use of strategies.”} \]

- How can executive functions influence memory?

  \[ \text{Answer: “If activities are performed in a systematic way; following a well thought out plan, then steps are less likely to be forgotten (e.g. baking a cake).”} \]

  \[ \text{The more organised you are with aspects of your daily routine, the less reliance you will place on your memory.} \]

- What strategies can we use to overcome problems in executive functioning and maximise our memory?

  \[ \text{Answer: Make notes; Keep an A4 diary by the phone; Transfer and check this information each night in a smaller diary.} \]

  \[ \text{Keep objects in set places and always return items after you have finished using them.} \]

  \[ \text{File all important documents straight away and have a designated draw that you keep this information in.} \]

  \[ \text{Use a memory note book.} \]

- What other lifestyle factors that we have just discussed could be influencing our memory functioning?

  \[ \text{Answer: Psychological Factors (mood symptoms such as depression, grief, anxiety and stress); Negative attitudes and self defeating thoughts; A lack of mental stimulation, social interaction and physical activity can also influence memory abilities.} \]

  \[ \text{Health Issues, Physical Illness and certain medical conditions Medications, Sensory Losses, Fatigue, Alcohol & Poor Nutrition} \]
7. Closing statements

- Today we have emphasised some of the factors that can influence memory and how to change these.

- We have reviewed the cognitive factors and have also discussed psychological and health factors.

- Next week we are going to focus on memory itself and begin to explore more specific strategies to help with everyday memory problems.

SEE NEW SLIDE

- Thank you for coming today. I’ll see you all next week.
SESSION FOUR:

Memory:
The Basics – Misconceptions, Home Truths and all That’s in Between
SESSION FOUR: Memory: The Basics - Misconceptions, Home Truths and All That’s in Between

Objectives:

- Introduction
- Brief review of previous session topic
  - Attention
  - Executive Factors
  - Psychological Issues
  - Health Issues
- Provide examples of myths about memory
  - Group discussion regarding these myths
- Introduce topic on how memory works
  - Discussion of Working Memory
  - Group Activity demonstrating the role of Working Memory (WM)
  - Discussion of Long Term Memory (LTM)
  - Group Activity demonstrating the difference between WM and LTM
- Introduce terms: encode, storage, retrieval
- Define encoding
  - Group activity to demonstrate role of attention in encoding
- Tea Break
- Discuss storing information into LTM
  - Group activity demonstrating effective ways to store information in LTM
- Discuss retrieval strategies
  - Group activity to demonstrate difference between recall and recognition
- Closing remarks and introduction to next session topic
Introduction

- Thank you for attending today.
- Here is a copy of the material being covered in today’s session.
- Let’s spend a few minutes reviewing what we have covered over the last few sessions and then we will focus on today’s material, which will more specifically address memory functions.

1. Review of Previous Session Material

- I am going to briefly summarise the information we have previously covered on the role of attention, processing speed and executive abilities in memory functions.

  **Attention/Processing Speed**
  
  - You will recall that to efficiently remember something, we need to focus on the information and give it our full attention.
  
  - We also need to be mindful of the fact that there is only so much information we can hold in our mind at any one time and if we are distracted by other sounds, sights or thoughts, the information we are trying to remember can be displaced or lost.
  
  - The key is to minimise distractions.
  
  - Importantly, some information may also take us a little longer to process. We may therefore require additional repetition or the rate of presented material to be slowed down when trying to remember it.

**Planning and Organisation**

- Instances of forgetting may be due to a lack of organisation. It is important to try to be systematic in the way you plan and organise your appointments, daily activities and aspects of your lifestyle.

- Have set places for objects and return things immediately when they are not in use.

- Store important information in a safe place, though where they are not likely to be overlooked.
Summary of the psychological and health factors that can influence memory.

We also talked about other factors that we can encounter in our everyday life that may impact on memory. These include our mood state, such as depression, anxiety and stress. Any health issues we might have as well as medications and alcohol can also influence memory functioning.

Any questions?

Let’s move on to today’s topic.

2. Myths about memory

I’m sure all of you at one time or another have heard one or more of the following sayings:

- “Ageing and memory loss go hand in hand”
- “Nothing can be done to stop memory loss”
- “You can’t teach an old dog new tricks”

How do you feel when you hear these sorts of comments; Do you think there is some truth to them – If not why/If yes why?

The fact is that older adults can learn new information. This session will be spent looking specifically at memory and steps one can take to further improve memory.
3. How Does Memory Work?

SEE NEW SLIDE

- In order to understand how best to cope with changes in memory abilities as we age, we first need to discuss how we learn and remember information in the first place.

- There are two terms that you may be familiar with. The first is working memory or short term memory and the other is long term memory.

- Learning new information also requires the processes of encoding, storage and retrieval. These terms will also be discussed.

  - **Working Memory or Short Term Memory**

    NEXT

  - Is a temporary memory store.

    NEXT

  - It is the small amount of information that can be held in the mind at any given moment.

    NEXT

  - Most experts believe that working memory can hold no more than six or seven items.

    NEXT

  - This material is discarded in five to ten seconds unless it is either continually repeated or stored in long term memory.

    NEXT

  - An example of information that is held in working memory and generally discarded without being stored is a telephone number.

    NEXT

  - Just a small fraction of information that registers in working memory gets stored in long term memory.

  - Let’s try an exercise activity to demonstrate working memory

SEE NEW SLIDE
4.1 GROUP EXERCISE ACTIVITY:
Digit Span

SEE NEW SLIDE

· Long Term Memory –

   · This is the memory bank.

SEE NEW SLIDE

   · It is the largest component of the memory system and its storage space is practically limitless.

SEE NEW SLIDE

   · It refers to any information that is no longer in conscious thought but is stored for potential recollection at a later stage.

4.2 GROUP EXERCISE ACTIVITY:
STM vs LTM

SEE NEW SLIDE

· Remembering depends on learning and storing information so that it can be retrieved at a later stage.

SEE NEW SLIDE

· In order to successfully remember something you need to:

   · **Encode** new information – get information into memory

SEE NEW SLIDE

   · **Store** new information – retain information over time

SEE NEW SLIDE

   · **Retrieve** information – take information out of storage ie. from long term memory
5. **Encoding**

- Encoding is the process of getting information into memory.
- There are a number of steps involved in the encoding of information.
- Encoding involves
  - Paying attention to something
  - Associating it with something already known
  - Analysing information for meaning
  - Elaborating on the details.

“Attention” is the first step in the process of encoding. We have previously discussed the importance of attention and it is one of the tasks of working memory. It may require conscious effort. Focussing attention plays an important role in being able to remember what you are trying to remember.

Let’s take a look again at how distracting information makes it difficult to attend to new material.

**4.3 GROUP EXERCISE ACTIVITY:**

*Story Reading (Difficult & Easy – using distractors)*
· The second state in encoding is “association.”

· New information is encoded by connecting or “associating” it with other well known and relevant information already in long term memory.

· Much association is done unconsciously. The more effort you put into creating associations the more likely you are to recall.

· Let’s run through an example of how the difference between being able to associate information with previously learnt material and something that is unfamiliar, influences memory.

SEE NEW SLIDE

4.4 GROUP EXERCISE ACTIVITY:
Story Recall (Difficult & Easy – using technical information)

SEE NEW SLIDE

· “Analysing” information for meaning and “Elaborating” on the details are also components of encoding.

· They result in deeper encoding and involve the processes of study and repetition.

SEE NEW SLIDE

6. Tea Break
· Let’s have a tea break and then continue talking about the other processes involved in memory.
7. Storing information

- The second important component of memory is the storage of new information.
  NEXT

- There are a number of different memory stores that house information related to general knowledge, facts, personal/autobiographical details and memory for skills (e.g. driving a car).
  NEXT

- Memory is organised into different networks and connections.
  NEXT

- Some people may also find that they are naturally better at learning certain types of information, for example verbal versus visual material.
  NEXT

- You can think of your memory storage system as like a complicated filing system.
  NEXT

- The better organised the information and the filing system is, the easier it will be to recall details at a later time.

- Let’s have a look at a list learning task and the difference that organisation of material makes when we are trying to learn it.

SEE NEW SLIDE

4.5 GROUP EXERCISE ACTIVITY:
List Recall

SEE NEW SLIDE
8. Retrieval

· Once we have learnt new information, we need to be able to retrieve it at a later stage. You might spend some time learning the name of a new friend. You will want to make sure that you can retrieve the name of your friend when you next meet them in passing.

· Retrieval therefore, involves getting information from long term memory into consciousness.

· Retrieval is accomplished by using recognition or spontaneous recall.

· Retrieval can be triggered by cues.

· Trying to spontaneous recall information is much harder than recognition where there is a reliance on cues.

· We can demonstrate the difference between spontaneous recall and recognition by reading the following passage and trying to answer some questions about it.

4.6 GROUP EXERCISE ACTIVITY:
Story Recall vs Recognition

9. Closing

· Today we have looked at the different processes involved in memory and have talked about how we lay down new memories and retrieve information when we need it.

· In our next session we are going to build on this information and start developing strategies to assist with memory functioning.

· Thank you all for attending. See you next week.
SESSION FIVE:

THE AGEING BRAIN:

Improving Memory in Everyday Life

Part One
SESSION FIVE: Improving Memory in Everyday Life – Part One

Objectives:

- Brief review of previous session topic
  - Administer quiz

- Discuss reasons for memory difficulties

- Discuss importance of a positive attitude on memory

- Discuss role of interest and intent on memory
  - Group activity demonstrating importance of effort

- Discuss role of selectivity on recall
  - Group activity demonstrating selective attention

- Discuss role of meaningful organisation on memory
  - Group activity demonstrating importance of organisation of material to be encoded

- Tea Break

- Discussion regarding depth of processing
  - Rehearsal, Elaboration, Relating
  - Role of Visualisation
    - Group Activity demonstrating technique of visualisation

  - Role of Association
    - Group Activity demonstrating technique of association

- Summary statement regarding importance of effort and encoding

- Introduce next session
1. Review Previous Session

   · Let’s start off today’s session with a quiz on some of the things we have learnt so far. We will pair up for this and you can go through your folders to try to answer the questions if you get stuck. I will give you five to ten minutes to come up with your answers and then we will review them together.

   **SEE NEW SLIDE**

**5.1 GROUP EXERCISE ACTIVITY:**

**Quiz**

   · How did everyone do? Make a note of anything that you had trouble with, so that you can review that information at a later stage.
2. Introduction

- Today we are going to incorporate what we now know about memory and start learning some strategies.

- Here is a copy of the material being covered in today’s session.

- Before we get started, let’s think about a few issues.

  SEE NEW SLIDE

- No one can remember everything and before you blame a faulty memory bear in mind some of the ideas that we have already covered:

  · Some memories fail to enter into the memory bank in the first place for example, we may not have attended to the information properly in the first place. Perhaps you were distracted by other thoughts or things going on around you.

  NEXT

  · Old memories that are similar to new information may interfere with the storage of the new details. You might have two friends that enjoy similar hobbies and it might make it difficult for you to recall the specifics of the particular activities engaged by each friend.

  NEXT

  · Information with fewer associations and little background is harder to recall. If you are reading something for the first time that is on a topic that you are not familiar with, it may be harder for you to try to encode this information to recall it at a later time. Think about the stories we tried to remember about Fuel Injection and JFK. You found it easier to remember the details about JFK because you could associate the information with what you already knew.

  NEXT

  · Some information might need specific or discrete cues for you to recall it. You may find it easier to recall the name of a specific place, once you think of other information related to it. The exercise activity about the Diary of Anne Frank demonstrated the difference between trying to recall information and the benefits of cues.

  NEXT

  · Memories can fade. You might find that if there is a particular friend you have not seen for a long time, details about their background might be harder for you to remember.

  NEXT

- Being mindful of some of the cognitive, psychological and health factors we have previously discussed and their effects on memory is also very important.

  SEE NEW SLIDE
2. **Improving Memory – Making it work for me, not against me**

   - Since there are many factors that can interfere with memory, it is important to keep a positive and open mind. Simply changing your attitude about the way you think about memory problems can play a very important role in your ability to remember things.

   - If you tell yourself that you couldn’t possibly remember a piece of information given to you, you will be unlikely to concentrate on the information and you will forget it.

   - A positive attitude is the first step towards a stronger and more effective memory.

3. **The Basics**

   - If there is something new you are trying to remember, it is important to make an effort to recall the details in the first place.

   - The brain prioritises information by meaning, value and relevance. Motivation and personal relevance of information will influence ability to remember something.

   - Another point to keep in mind is the amount of information you are trying to remember.

   - If there are lots of things you are trying to remember at once, it is likely to be more difficult to remember all of the details.

   - Determine what is most important and begin with this and then move on to more detailed information. That is, be selective in what you are trying to learn.

   - Let’s try an example of selective attention.

5.2 **GROUP EXERCISE ACTIVITY**

**Selective Attention: Story recall exercise**

5.3 **GROUP EXERCISE ACTIVITY**

**Meaningful organisation: Word List Learning Task**
4. **Tea Break**
   
   · Let’s take a ten minute break.

5. **Strengthening the memories**

   **SEE NEW SLIDE**

   · Now we are going to review ways we can make information easier to remember.

   · The “deeper” you process information the more likely you will be able to retain it and recall it later on.

   · Deeper processing involves:
     
     · Rehearsing
     · Elaborating
     · Associating

   **NEXT**

   · Rehearsing information involves repeating the information several times to yourself. Regular rehearsal will make it easier to learn something new.

   **NEXT**

   · Elaborating on the information means undertaking activities such as visualisation, which is something we have talked about previously. Visualisation is the process of consciously creating an image in your mind of a task, a number, a name, a word or a thought.

   **NEXT**

   · Associating information involves relating the information with something already known.

   · First, let’s try an example of visualisation together. You might find this easier if you close your eyes.

   **SEE NEW SLIDE**

**5.4 GROUP EXERCISE ACTIVITY:**

**Visualisation Task**

**SEE NEW SLIDE**
1. Relating or associating information is also something we have previously discussed. It is the process of forming mental connections between what you want to remember and what you already know.

2. The conscious creation of an association is an excellent strategy for encoding new information.

3. Once you make an association, repeat it several times in your head or aloud; this will help you to remember.

4. Associations are useful if you are trying to remember such things as the name of your neighbour; the street where your friend lives; the title of a movie/book, street directions; the bus number to your shopping centre. Associations can be combined with visualisation. Let’s try an example.

5.5 GROUP EXERCISE ACTIVITY: Association and Visualisation Task

6. Closing Summary

- You can see that trying to remember new information takes effort and you will need to practice using the strategies.

- You need to selectively think about what it is you want to recall and make a conscious effort using strategies such as rehearsal, visualisation and association to help you remember.

- We will continue practicing with these sorts of strategies next week. Try practicing some of these techniques before you attend for the next session. Read over your manual and think about the ways you could adopt some of these strategies into your everyday activities.

- Before we leave today, who can remember that list of words we tried to learn earlier?

- Thank you for your participation today. See you next time.
SESSION SIX:

THE AGEING BRAIN:

Improving Memory in Everyday Life

Part Two
SESSION SIX: Improving Memory in Everyday Life Part Two

Objectives:

☐Brief review of previous session topic
  ☐Administer quiz

☐Using Strategies in Everyday settings
  ☐Group activity demonstrating use of Visualisation
  ☐Group activity – word pairs

☐Tea Break

☐Review word pairs

☐Review technique of Association

☐Review importance of Selective Attention

☐Group exercise activities incorporating strategies

☐Review additional memory strategies to be incorporated in the home and daily routine

☐Take Home Messages

☐Introduce next session
1. **Review of Previous Session**

   - Last week we started to discuss ways to enhance our encoding of material in order to improve our storage and retrieval of information.

   SEE NEW SLIDE

   - Let’s review some of the terminology we discussed by having a Pop Quiz on the previous session material.

**6.1 GROUP EXERCISE ACTIVITY:**

**Pop Quiz**

   - How did everyone do? Make a note of anything that you had trouble with, so that you can review that information at a later stage.

SEE NEW SLIDE
2. Using Strategies Every Day

· Today we are going to continue to apply some of the strategies we have reviewed.

· Here is a copy of the material being covered in today’s session.

· As we have previously discussed, strategies take thought and practice and the more you incorporate them into everyday life the easier you will find it to remember things.

· The more often you practice using the strategies, the more automatic they will become.

· Last week we talked about the use of techniques such as visualisation and association.

· Visualisation is the process of consciously creating an image in your mind of a task, a number, a name, a word or a thought. Focussing your attention on a clear image of an object will help you carry it in your mind long after you first perceived it.

· Stop and think about an object every time you put it down; create a visual image of where the object is. For example, you might have a habit of losing your sunglasses; each time you take them off, stop and create a mental image of the table/bench/dresser you put them on.

· Last week we also talk about the use of Association.

· Association is the process of forming mental connections between what you want to remember and what you already know.

· This could be the name of a grandchild, which side of the car you have your petrol on, your favourite book title.

· The more you actively/consciously try to remember something the easier it will be for you to remember the information. You might for example want to recall the conversation you are having with someone, so you can tell someone else about this information at a later stage. During the conversation, think about the information you are being told, associated it with other information you know/things you have personally experienced; ask the speaker questions etc.

· I want you to think about these sorts of strategies as well as some of the other techniques we have discussed as we try to this next exercise. We are going to try to remember a list of word pairs.

SEE NEW SLIDE
6.2 GROUP EXERCISE ACTIVITY:
Learning Word Pairs

· The deeper you encode the information, that is the more you process it, the easier it will be for you to recall it at a later instance.

SEE NEW SLIDE

3. Tea Break

· Good work everybody…I think we all deserve a tea break.

4. Review of Word Pairs

SEE NEW SLIDE

· Now let’s try to remember the list of word pairs we learnt earlier.

6.3 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs

SEE NEW SLIDE
5. Using Strategies Every Day – Review of Selective Attention

SEE NEW SLIDE

· You will recall that another term we have looked at previously is “selective attention.”

· Selective attention refers to the ability to be attentive to whatever you select (or choose) to concentrate on. You will remember best, the things that you selectively analyse and pay attention to.

· For example, if you went to a movie and you wanted to remember the details to tell your friend the next day, you should go to the movie keeping a few questions in mind such as:
  · What is the main genre (eg. comedy, thriller, romance)?
  · Where is the story set?
  · Who are the lead actors/actresses?

· You would then ask yourself these questions during and again immediately after the film and think about your reasons for each response.

· If there was important information in an article that you were trying to remember, pick out the key points that are important to you and focus on those.

· The more analysis you undertake, the better you will remember. Active selection of what you want to analyse is very important. You can choose to focus on some things and leave other things out. This reduces memory burden. The elements you focus on and analyse, you should have greater ease trying to remember.

· Let’s try an example of selective attention.

SEE NEW SLIDE

6.4 GROUP EXERCISE ACTIVITY:
Story recall

7. Discussion of strategies to implement in the home as exercise activity incorporating the below tasks:

· I am going to provide you with a number of strategies you can incorporate into your home and lifestyle and I’d like you to work on implementing and practising these ideas over the next week.

· Practice is a key component in memory tasks. Practice increases familiarity and improves speed as well. It also allows a person to develop memory strategies that can be useful for remembering a lot of detail.

SEE NEW SLIDE

· If some of these ideas are things you already do, then think about how you can be even more efficient.

NEXT
Session Six: Improving Memory in Everyday Life Part Two

- Write it down – lists, schedules and diaries help you to record information. This helps you to remember better and you can always refer back to what you have written. Making the list helps in thinking about the information in a careful way and may also lead to better organisation of the material (eg. writing a shopping list by categories or by section of the store).

  NEXT

- Put things in the same place – have a set place for items and get into the habit of putting things away immediately after you finish using them.

  NEXT

- Repeat information – if you are told something important that you can’t write down, repeat the information and visualise it. Associate and relate it to something else you already know or need to do.

  NEXT

- Make associations – if you want to remember something you need to buy at the store, think about what you are actually planning on using it for.

  NEXT

- Use Triggers – For example, you should place items near the door the night before if they are things you need to take with you the next day.

  SEE NEW SLIDE
8. Take Home Message

- Choose something specific you want to remember

SEE NEW SLIDE

- Review the possible techniques and select one

SEE NEW SLIDE

- Try the technique

SEE NEW SLIDE

- If the chosen technique doesn’t work try something else

SEE NEW SLIDE

- Don’t feel defeated if some things are particularly hard to remember.

SEE NEW SLIDE

- Before we finish up for today…let’s go over those word pairs one more time.

SEE NEW SLIDE

6.5 GROUP EXERCISE ACTIVITY:
Recall of word pairs.

SEE NEW SLIDE

9. Closing Comments

- Thank you all for attending today.

SEE NEW SLIDE

- I hope this session provided you with examples of ways to practically apply some of the strategies we have been discussing.

SEE NEW SLIDE

- Next week we are going to spend some time reviewing the ideas we have learnt so far and performing additional practice activities.

SEE NEW SLIDE

- See you all next week.
SESSION SEVEN:
BACK TO BASICS
SESSION SEVEN: Back To Basics

Objectives:

- Introduce session outline

- Review Homework activities
  - Group discussion
  - Review previously learnt word pairs.

- Review of attention, processing speed, executive functions (aging changes; effects on memory)
  - Group Exercise activity: Audio task

- Tea Break

- Review memory strategies
  - Group Exercise Activity: Word List Learning Task
  - Group Exercise Activity: Story recall
  - Group Exercise Activity: Paired Associates Task

- Introduce next session
1. Introduction

- Thank you for attending today’s session.
- Here is a copy of the material being covered in today’s session.
- We are going to spend this lesson reviewing some of the concepts we have learnt along the way and undertaking lots of different mental exercise activities.
- Firstly, let’s go over some of the ideas you were going to try to adopt in your home and daily schedule.

SEE NEW SLIDE

2. Review homework activities

- The first habit we talk about was “writing things down”.
  - Who made alterations to the way they used a diary and shopping lists?
  - What other activities did you do to incorporate writing things down?
  - Who checked there were always a notepad and pen by the phone?
  - Who put these things in their bedroom to organise the days activities the night before?
- We also talked about organising set places for items. Did anyone go home and evaluate the way they were storing items?
- Other techniques we spent time learning about were the ideas of repetition, association and triggers.
  - Did any of you have the opportunity to use these techniques over the last week?
  - Why did you/didn’t you use certain techniques?

SEE NEW SLIDE
3. Review of word pairs from last week
   · Group to recall pairs from previous session.

   **7.1 GROUP EXERCISE ACTIVITY:**

   Word Pair Recall

   See New Slide

4. Review of attention, processing speed and executive functions.
   · You will recall that in some of the first sessions we talked about how attention and processing speed abilities change as we get older.
   · We also discussed the role that these aspects of cognition play in memory as well as the influence of executive functions such as planning, organisation and strategy use.
   · Let’s undertake a task requiring attention, processing speed and memory.

   See New Slide

   **7.2 GROUP EXERCISE ACTIVITY:**

   Sustained Attention

   **Following Task:** Completing that task accurately and efficiently required a number of different cognitive abilities. You needed to selectively attend to the information I asked you to listen out for. You needed to be able to process the information at an adequate rate to keep up with the story and you also had to remember the details as they were being presented to you.

   See New Slide
   · Let’s have a tea break and then we will undertake some more tasks.

5. Tea Break

   See New Slide
6. **Word List Learning Task**

   - Let’s spend some time learning a word list. I want you to think about the strategies you could implement to learn this list.
   
   - I am going to read it to you three times. After each reading I want you to write down all the words you can remember.

**7.3 GROUP EXERCISE ACTIVITY:**

Word List Learning Task

SEE NEW SLIDE

7. **Story Recall**

   - I am going to read a story to you now. I want you to listen carefully. There are three questions I will ask you at the end of the story. Try to visualise the story while I am reading it to you, and think about the details. You don’t have to be able to remember all the details. Try focussing on understanding what is being read to you, and associating the information with things you already know in order to help you remember it.

**7.4 GROUP EXERCISE ACTIVITY:**

Story Recall

SEE NEW SLIDE

8. **Paired Associates Task**

   - Let’s try one more activity for today. I am going to show you some pairs of objects for thirty seconds and ask you to remember the objects that go together. I don’t want you to write these down. Are you ready?

**7.5 GROUP EXERCISE ACTIVITY:**

Visual Paired Associates Recall

SEE NEW SLIDE

9. **Closing**

   - That was our last exercise for today

SEE NEW SLIDE

   - Thank you all for attending

   - I hope you feel that you are starting to develop a number of strategies to improve aspects of your thinking.

   - I’ll see you all next week when we will have a look at language abilities, how these change as we get older and ways for improving your language skills.
SESSION EIGHT:

LANGUAGE PROCESSES

On the Tip of My Tongue
SESSION EIGHT: Language Processes: “On the Tip of My Tongue”

(Reference: Wingfield & Stine-Morrow in Craik & Salthouse The Handbook of Aging and Cognition)

Objectives:

☐ Introduce session outline

☐ Discussion of language abilities and how these change as we get older

☐ Definition of semantic memory

☐ Review strategies for when one experiences word finding difficulties

☐ Group activity completing different language exercises

☐ Tea Break

☐ Continue group activity completing different language exercises

☐ Closing comments and introduction of next session
1. Introduction

- Thank you all for attending today
- This session will be focussing on our language skills and what to expect as we get older. We will also discuss ways of strengthening our abilities.
- Here is a copy of the material being covered in today’s session.
- Firstly let’s start with an overview of a common phenomenon.

SEE NEW SLIDE

2. Aging and Language Skills

- Research shows that as we age there are changes in our expressive language abilities.
- These changes are only slight, though become more apparent after the age of 70.

SEE NEW SLIDE

- We have all experienced the “Tip of the Tongue” (TOT) phenomenon. These are instances when you feel that you know the name of an object, person or place, yet the word just won’t come to you.
- This can lead to anxiety, which then makes it harder to recall the information you are looking for.
- The TOT experience was first examined experimentally in the 60s by Brown and McNeill who referred to the feeling as

“…analogous to being on the brink of a sneeze: a sense of mild torment, followed by considerable relief when the act is finally accomplished”.

- I’m sure this is something that we can all relate to.
- I am going to show you some pictures of common and not so common objects that we are going to name. Some of you might experience the TOT phenomenon…you’ll know the object though have trouble accessing then name for it.

SEE NEW SLIDE

8.1 GROUP EXERCISE ACTIVITY
Picture Naming Task
3. Is it a problem with my memory?

· We have spent some time talking about memory and the different ways to learn new information.

· There are many different types of memory systems within the brain. We have already talked about working memory and long term memory. Another form of memory is Semantic memory.

· Semantic Memory or World Knowledge is the pool of information acquired over a lifetime from both educational and everyday experiences.

· It accumulates with age. In tests that measure knowledge and vocabulary, older adults do as well or better than younger people, it just may take greater effort to retrieve the information you are looking for.

· Therefore, in instances when we experience the TOT phenomenon, it may not necessarily be a problem with memory, but a problem with efficient word retrieval.
4. How do I find the words?

- We are going to briefly discuss some strategies/techniques you can try to adopt when the word you want is elusive.

   NEXT

- The next time you find yourself searching for a name/word try to relax, take a deep breath and think of related items. If you still can’t retrieve it, don’t worry, it will come at a later time, probably when you are thinking of something else.

   NEXT

- Keep in mind that it also takes longer for older adults to recall the information they need, so try not to become impatient with yourself when the information doesn’t come to mind immediately. Expertise and familiarity in a specific area often more than compensate for the slowing down of recall.

   NEXT

- If there are specific words or terms you are trying to learn, start a list with the correct definitions. Keep this handy, for example in your memory book. Regularly refer to this and try to incorporate the words into your everyday conversation as much as possible. This will help you to remember them.

   NEXT

- Practice activities that challenge your word knowledge. Undertake crosswords of varying complexity; complete word puzzles and quizzes. Reading is another way to keep your vocabulary in check.

- We are going to spend the rest of the session, undertaking different types of language tasks.

   SEE NEW SLIDE
8.2 GROUP EXERCISE ACTIVITY: Proverb completion

SEE NEW SLIDE

8.3 GROUP EXERCISE ACTIVITY: Crossword completion

SEE NEW SLIDE

- Let’s have a tea break

5. Tea Break

6. Language Exercises Continued

- Let’s continue to work on activities to stimulate our language processes.

SEE NEW SLIDE

8.4 GROUP EXERCISE ACTIVITY: Word Generation

Allow five to ten minutes for this task. Check how they all performed.

SEE NEW SLIDE

8.5 GROUP EXERCISE ACTIVITY: Vocabulary definitions

SEE NEW SLIDE

8.6 GROUP EXERCISE ACTIVITY: Paragraph reading and comprehension questions

During this task I want you to actively read the paragraph. Think about the details, visualise it as you are going along. Don’t rush your reading. You will have five to seven minutes to read the paragraph and answer the questions… I want you to try to answer the questions without having to refer back to the paragraph.

SEE NEW SLIDE

8.7 GROUP EXERCISE ACTIVITY: Category Fluency

“You will have 90” to come up with 15 different types of fruit. Ready…begin.”

SEE NEW SLIDE

8.8 GROUP EXERCISE ACTIVITY: Picture Naming
6. Closing Comments

- Thank you for attending today’s session focussing on language skills.

- These sorts of activities can be found in magazines at your local newsagent, on the world wide web and in the newspaper.

- Remember to challenge yourself by reading different types of books and sections of the newspaper. If there are words/definitions you are uncertain of, look them up and create a “new words” list.

- Next week we are going to look at other ways to keep mentally fit and to review some of the valuable skills we have learnt so far.

- See you all next session.
SESSION NINE:

MAINTAINING THE MIND AND SHARPENING THE TOOLS
SESSION NINE: Maintaining the Mind and Sharpening the Tools

Objectives:

☐ Introduce session outline

☐ Discussion of strategies for keeping mentally fit
  ☐ Diet, exercise, sleep hygiene, mood and psychological issues, mental activity

☐ Review memory strategies
  ☐ External aids
  ☐ Encoding strategies
  ☐ Word Pairs Learning Task

☐ Tea Break

☐ Group activity completing different memory exercises
  ☐ Story Recall
  ☐ Word List Learning Task

☐ Closing comments and introduction of next session
1. Introduction

· Welcome back.

· Here is a copy of the material being covered in today’s session.

· To begin with today, we are going to talk about how we can keep our mind’s mentally fit. Following some group discussion we are also going to spend time reviewing information we have covered in previous sessions.

· Let’s begin.  

SEE NEW SLIDE
2. Keeping Mentally Fit

I’m sure you are all familiar with the saying “use it or lose it”. Is anyone able to explain to the group, what this saying is referring to?

Research is continually exploring the idea of “Use it or lose it” and at present, there is some suggestion that by continually challenging and using our cognitive abilities, we can maintain our mental capacities well into older age.

There also appear to be certain examples in the media that support this idea. In 2001 an article was published in the New York Times which detailed the careers of older adults aged 90 and above who continued to work in paid employment, some in managerial positions.

So, how can we keep our mind’s health and the aging processes at bay. Let’s go through some of this information together. Please feel free to respond when I raise each idea.

What do we know about the importance of diet? – We know that it is important to maintain a healthy body weight; and the value of eating a healthy, well balanced diet. We are also aware of the dangers associated with smoking and excessive use of alcohol.

How about exercise? Who engages in regular physical activity, including an adequate aerobic workout?

You may not be aware of the importance of good sleep hygiene – Address any sleeping difficulties to avoid fatigue which can lead to problems such as mental sluggishness.

Mood and psychological issues are also important in maintaining mental fitness. We need to aim to minimise stress and balance activities during the day. We also need to be mindful of the symptoms/development/effects of depression. Maintaining social contacts is also important.

Mental activity – challenge yourself intellectually and engage in activities that have personal meaning.
3. Applying the Knowledge

- Let’s review some of the strategies we have talked about to help our memory skills and look at incorporating these into our daily activities.

What things have you found have helped you with your memory in your daily activities/environment?

- Use of memory notebook
- Organising the home environment
- Adopting external aids (eg. calendars, white boards etc)

- What about the use of some of the other strategies we have been practising such as repetition, visualisation and association.

9.1 GROUP EXERCISE ACTIVITY:
Word Pairs List Learning Task

9.2 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs List Learning Task

4. Tea Break

- Let’s try to recall the word pairs that we learnt a little earlier

9.2 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs List Learning Task

5. Individual and group practice with mentally challenging tasks and application of strategies (eg. story recall; organising a list of daily activities)

- Let’s try another memory task…
9.3 GROUP EXERCISE ACTIVITY: Story Recall
During this task I want you to actively read the paragraph. Think about the details, visualise it as you are going along. Don’t rush your reading. You will have five to seven minutes to read the paragraph and answer the questions… I want you to try to answer the questions without having to refer back to the paragraph.

SEE NEW SLIDE

9.4 GROUP EXERCISE ACTIVITY: Word List Recall

SEE NEW SLIDE

6. Closing Comments

· Thanks for attending today

· Hopefully by now, you are starting to find it more automatic to apply the strategies we have learnt.

· You might also be feeling more confident across aspects of your mental abilities.

· Next week is our final session. We are going to review the program and provide you with take home messages for maintaining your mental fitness.
SESSION TEN:
FINAL REVIEW AND TAKE HOME MESSAGE
SESSION TEN: Final Review and Take Home Message

Objectives:

- Introduce session outline

- Review attention, processing speed and executive functions
  - Complete group activity

- Review memory
  - Complete group activity

- Tea Break

- Review language
  - Complete quiz and group activity

- Closing comments
  - Reminder of 6 month booster telephone call
  - Reminder of 12 month testing
  - Thank you
Introduction

· Today is our final session.
· Thank you all for attending and sticking with the program.
· We are going to spend this last class reviewing all of the information we have covered over the last nine weeks.
· Hopefully you will leave today and feel confident about your mental abilities and have learnt some strategies to help you across various aspects of your everyday life.

SEE NEW SLIDE

1. Review Attention, Processing Speed and Executive Functions

· Let’s review what we have learnt about the influence of attention on our memory.

· What strategies can we use to improve our attention and help us to remember information?

   (Minimise fatigue, minimise distraction, reduce competing demands, organise)

· How does processing speed influence memory?

   (Slower to process information; makes it difficult to process large amounts of detail quickly)

· What can we do to enhance our processing abilities?

   (Reduce time pressures; repetition; practice)

· What are executive functions?

   (A range of abilities that include, planning, organisation, strategy implementation)

· How can we improve our memory through this aspect of our cognition?

   (By adopting strategies to compensate for cognitive changes that occur naturally with age).

SEE NEW SLIDE

· Let’s complete some activities now that require processing speed and attention.

10.1 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task

SEE NEW SLIDE

10.2 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task

SEE NEW SLIDE
Session Ten: Final Review and Take Home Message

10.3 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task

SEE NEW SLIDE

2. Review Memory Processes

- Now let’s review some of the information we have learnt about memory.

- What is the difference between STM and LTM?
  (Working Memory or Short Term Memory – is a temporary memory store. It is the small amount of information that can be held in the mind at any given moment. Long Term Memory is the memory bank. It is the largest component of the memory system and its storage space is practically limitless. It refers to any information that is no longer in conscious thought but is stored for potential recollection at a later stage.)

- What terms do we use when we talk about learning new information so that we can use it at a later stage?
  (Encoding, storage, retrieval)

- How can we ensure that information enters our LTM bank?
  (Deep processing by using the strategies of rehearsing, elaborating, relating)

- What strategies can we use around the home to help with memory?
  (External strategies – notebook, lists, organisation/routine, set places for objects)

- What strategies can we use to learn new information?
  (Visualisation, Association, Repetition/Rehearsal

SEE NEW SLIDE

- Let’s try a quick memory task before we have a tea break

10.4 GROUP EXERCISE ACTIVITY:
Memory Task

SEE NEW SLIDE

3. Tea Break

SEE NEW SLIDE
Let’s try another memory task before we move on to talking about language.

**10.5 GROUP EXERCISE ACTIVITY:**
**Memory Task**

- All of these sorts of activities are all things that you can devise yourself, to give yourself a mental challenge. Remember… “use it or lose it”

SEE NEW SLIDE

---

4. **Review Language Abilities**

- Let’s move on to review language.

- What is the TOT phenomenon?
  
  (An experience whereby you know the word you are looking for but experience difficulty retrieving it.)

- How can we deal with the TOT phenomenon?
  
  (By relaxing; thinking of similarly related information; being patient)

- What strategy can we use if we are trying to learn new and unfamiliar terms?
  
  (Start a list with the correct definitions. Keep this handy, for example in your memory book. Regularly refer to this and try to incorporate the words into your everyday conversation as much as possible.)

SEE NEW SLIDE

- Let’s try some activities that will stretch our language skills. Remember, you can obtain examples of these sorts of activities from your local newsagent, in the newspaper and on the internet…don’t be afraid to challenge yourself.

**10.6 GROUP EXERCISE ACTIVITY:**
**Word Challenge**

SEE NEW SLIDE

**10.7 GROUP EXERCISE ACTIVITY:**
**Crossword Challenge**

SEE NEW SLIDE
5. Closing statements

- We’ve come to the end of our program.
- Thank you all for participating across the 5 weeks.
- I hope you have found it enjoyable and you have changed some of your views about your cognitive abilities.
- I encourage you to continue to use the information that you have been taught and periodically review the summary handouts for each of the sessions.
- Continue using your memory notebooks and incorporating this into your daily routine.
- You will all be asked to attend for your follow-up testing so that we can look to see whether there has been any change in your cognitive performance over the course of our program.
- You will all be contacted in six months time so that we can see how you have progressed with your use of the strategies we have talked about. This will also be an opportunity for you to discuss any difficulties or challenges you may have noticed trying to incorporate the information we have learnt.
- In twelve months time we will contact you to visit us again so that we can complete the testing process and finalise your involvement in the study.
- Does anyone have any questions?
Appendix B: Cognitive Activity Group Participant Manual
Promoting Healthy Ageing with Cognitive Exercise

The P.A.C.E Study

COGNITIVE ACTIVITY
PROGRAM HANDBOOK
Promoting Healthy Ageing with Cognitive Exercise
(PACE)

The PACE study is a collaborative project between Royal Perth Hospital, the University of Western Australia and the Centre of Excellence for Alzheimer’s Disease Research and Care.

PACE TEAM

Project Co-ordinator  Ms. Mandy Vidovich

Investigators  Professor Osvaldo Almeida
               Professor Nicola Lautenschlager
               Professor Leon Flicker

Project Assistant  Ms. Josephine Shaw

PACE STUDY CONTACT DETAILS

You can contact the PACE team on:

Telephone: 9224 2855
Fax: 9224 8009

Address: WA Centre for Health and Ageing
         University of Western Australia
         Royal Perth Hospital
         Level 6 Ainslie House
         48 Murray Street
         Perth WA 6000
INTRODUCTION

Welcome to the Promoting Healthy Ageing with Cognitive Exercise (PACE) study. Without your participation this valuable research would not be possible and we thank you, and hope that you find the study interesting and enjoyable.

You will recall that this study has a number of components. This component is made up of ten sessions, aimed to provide you with information regarding your cognition (mental abilities) and strategies to help you maintain these skills.

You will be invited to attend a 90 minute session, twice a week, for five consecutive weeks. You will also have the opportunity to engage in group discussion, quizzes and problem solving.

Each session will be held in a conference room with no more than ten people in a group. The conference room is on:

Level 6
Ainslie House
48 Murray Street
Perth

The days and times you will need to attend each week are:

MONDAY TIME: _____________________

THURSDAY TIME: _____________________
# Promoting Healthy Ageing with Cognitive Exercise (PACE)

## CALENDAR 2008

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PARTICIPATION PLEDGE

Respect each other, including thoughts and opinions even if you disagree
Express your thoughts, but don’t shout or enforce them
Sensitivity to the views and beliefs of others is foremost
Participate and share work equally
Encourage and foster development; do not criticise or chastise
Create a comfortable learning environment for each other; be aware of personal space and privacy
Try to have fun!
OVERVIEW OF PROGRAM

| Session 1: | Introduction |
| Session 2: | The Ageing Brain: Is it really a memory problem? Part One |
| Session 3: | The Ageing Brain: Is it really a memory problem? Part Two |
| Session 4: | Memory: The Basics - Misconceptions, Home Truths and All That’s in Between |
| Session 5: | Improving Memory in Everyday Life Part One |
| Session 6: | Improving Memory in Everyday Life Part Two |
| Session 7: | Back To Basics |
| Session 8: | Language Processes - “On the Tip of My Tongue” |
| Session 9: | Maintaining the Mind and Sharpening the Tools |
| Session 10: | Review and Closing |
SESSION ONE: Introduction
SESSION ONE: Introduction

Session Outline

☆ Welcome

☆ Safety Issues

☆ Introductions

  ☆ Group Members
    First Names:  
    __________________________
    __________________________
    __________________________
    __________________________
    __________________________
    __________________________

☆ Group Activity

☆ Tea Break

☆ Group Activity

☆ Session Close
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?

Part One
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?

Part One

Session Outline:

★ Warm Up Exercise

★ The Ageing Brain

★ Attention

★ Strategies to Improve Attention

★ Tea Break

★ Processing Speed/Reaction Time

★ Strategies to Cope with Reduced Processing Speed/Reaction Time

★ Review

★ Session Close
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?

Part One

🌟 The Ageing Brain

- A number of natural changes occur across aspects of our cognition as we age.

- The word “cognition” – refers collectively to aspects of our mental functions such as the ability to think, reason and remember.

- Just as aspects of our physical functioning become less agile as we get older, so do aspects of our thinking. Much research has confirmed that as we age certain changes occur in our ability to learn new information.

  - Older adults tend to require more time to learn new information. They may also need to put in greater effort to absorb new information, such as extra attention and organising information more efficiently.

  - Older adults may also notice inconsistencies in what they can remember. Short term memory becomes worse yet Long term memory remains relatively stable.

  - As we get older, we also process information at a slower pace.
    - Essentially it takes longer to figure things out and to act on it. The more complicated the material, the slower the processing.
    - Positively, although older adults may be slower to respond or react, research has also shown they are likely to be more accurate than their younger counterparts.
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?
Part One

★ Attention

- Problems with memory can actually be due to problems with attention.

- As we get older, it becomes increasingly difficult to attend to competing activities, thoughts or conversations. Distractions such as a radio playing, someone talking or a doorbell ringing may disrupt concentration more as we get older.

- We have all experienced the situation whereby we go into a room and forget what we went in there for. This is likely to be caused by a problem with attention, rather than a problem with memory. At the time of going into the other room, the individual may have become distracted by another thought, or wasn’t adequately focussed on what they were doing in the initial instance.

“Many eyes go through the meadow, but few see the flowers in it”
(Ralph Waldo Emerson)
SESSION TWO:
The Ageing Brain: Is it Really a Memory Problem?
Part One

🌟 Strategies to Improve Attention

• Alertness and ability to respond to the environment will be influenced by fatigue.
  
  • Therefore, if there are complex activities to complete (eg. filling out tax forms), this should be undertaken at a time when the person feels most alert. Some people work best first thing in the morning; others feel they are more alert in the evening.

• Minimise the amount of distracting stimuli (eg. if reading an important document or difficult novel, take the telephone off the hook). When driving, turn the radio off, as this can be a source of distraction. If driving with a passenger, perhaps ask them not to talk whilst you are driving, as this can be a further source of distraction.

• If there are lots of activities to be completed, it helps to make a list. This will assist with working through each activity, one at a time, and prevent the individual from becoming distracted by thoughts related to the other things they are planning on doing.
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?
Part One

☆ Processing Speed/Reaction Time

- As we get older, it becomes harder to process information at the same pace as we once did. The individual may need longer to think about information and react to it.
- Importantly, the more familiar a person is with a subject, the quicker they will be to react (eg. playing chess; reading a novel on a familiar topic as opposed to something new).

“If they try to rush me, I always say, “I’ve only got one other speed and it’s slower.””

(Glenn Ford)
SESSION TWO:

The Ageing Brain: Is it Really a Memory Problem?
Part One

🌟 Strategies to Assist with Reduced Processing Speed/Reaction Time

- Try to reduce time pressures associated with activities. Plan ahead so that there will be no need to rush. Rushing increases stress and leads to mistakes.

- If someone is explaining a new topic and you experience trouble keeping up, ask questions to clarify the presented information. This will allow time to gather your thoughts, increase your attention and provide additional time to process the new information.

- Practice, practice, practice. The more familiar you are with information or a task, the less demands will be placed on your processing capacity.
SESSION THREE:

The Ageing Brain: Is it Really a Memory Problem?

Part Two
SESSION THREE:

The Ageing Brain: Is it Really a Memory Problem?
Part Two

Session Outline:

☆ Brief Review

☆ Executive Functions

☆ Utilising the “Executive” in You

☆ Tea Break

☆ Other Factors Influencing Memory
  ☆ Psychological Factors
  ☆ Health Issues

☆ Review

☆ Session Close
SESSION THREE:

The Ageing Brain: Is it Really a Memory Problem?
Part Two

☆ Brief Review

- Changes in our cognition occur naturally as we age.
- Inefficiency in attention and concentration can negatively influence memory functioning.
- The rate with which one can think about and manipulate new information also slows down as we get older. This process can also impact on memory abilities.
SESSION THREE:

The Ageing Brain: Is it Really a Memory Problem?
Part Two

☆ Executive Functions

· Executive functions include a range of abilities, including planning and organisation, time management and the use of strategies.

· Effective planning and organisation, structure and routine play a key role in memory functioning.

· If activities are performed in a systematic way, following a well thought out plan, then steps are less likely to be forgotten.

· Further, the more organised one is with aspects of their daily routine, the less reliance placed on your memory.

“Those Who Fail to Plan, Plan to Fail”
(Old Military Adage)
SESSION THREE:

The Ageing Brain: Is it Really a Memory Problem?
Part Two

☆ Utilising the “Executive” in Me

- When making appointments, make notes of these details in a set place. Don’t rely on scrap bits of paper. Keep an A4 diary by the phone to immediately pencil things in. Transfer and check this information each night in a smaller diary that can be carried in a pocket or handbag.

- Try to get into a habit of doing things straight away, rather than putting them off and having to rely on memory later on.

- Place calendars, wall charts or white boards in prominent places. Use stickers or symbols to mark important information.

- Write important questions down before going to appointments or making telephone calls to organisations/unfamiliar people.

- Utilise routines for certain activities. Eg. Always take medication at the same time, in the same place each day; such as just before brushing teeth in the morning, whilst in the bathroom.

- Keep objects in set places and always return items after you have finished using them.
  - For example, place a dish on a sideboard near the front door that is for house and car keys.
  - File all important documents straight away and have a designated draw that this information is kept in.

- If there are items you need to take with you when going out, place these in obvious sight, eg. near the front door.

- Create a memory notebook.
SESSION THREE:
The Ageing Brain: Is it Really a Memory Problem?
Part Two

🌟 Other Factors Influencing Memory

- **Psychological Factors**
  - Mood symptoms such as depression, grief, anxiety and stress can make it difficult to concentrate and can have an affect on memory. Most of the time, memory difficulties associated with mood changes are reversible once the psychological factors are dealt with.
  
  - Older adults tend to be more pessimistic about their ability to remember. Negative attitudes will cause people to put less effort into remembering, avoid tasks that require memory and feel anxious when their memories are tested in daily life. Be conscious of self-defeating thoughts.

  - A lack of mental stimulation, social interaction and physical activity can also influence memory abilities.

- **Health Issues**
  
  - Physical Illness and certain medical conditions can cause reversible changes in memory functions.

  - Some medications can slow thinking, cause drowsiness and diminish attention/concentration.

  - Vision and hearing difficulties will influence the accuracy of the information being processed to remember.

  - Fatigue/tiredness make it harder to pay attention and memory abilities will not be as sharp if the individual is not feeling well rested and alert.

  - Many people find they are less able to tolerate alcohol as they grow older.

  - Poor Nutrition can also influence cognition.
SESSION FOUR:

Memory: The Basics – Misconceptions, Home Truths and all That’s in Between
SESSION FOUR:
Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

Session Outline:

☆ Brief Review

☆ Myths About Memory

☆ How Does Memory Work?

☆ Tea Break

☆ Encoding Information

☆ Storing Information

☆ Retrieving Information

☆ Session Close

“The advantage of a bad memory is that one enjoys several times the same good things for the first time”
(Friedrich Nietzsche)
SESSION FOUR:
Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

☆ † Brief Review

- **Attention/Processing Speed**
  - To efficiently remember something, we need to focus on the information and give it our full attention.
  - Be mindful of the fact that there is only so much information we can hold in our mind at any one time and if we are distracted by other sounds, sights or thoughts, the information we are trying to remember can be displaced or lost. The key is to minimise distractions.
  - Importantly, some information may also take a little longer to process. Additional repetition may be necessary or the rate of presented material to be slowed down, when trying to remember it.

- **Planning and Organisation**
  - Instances of forgetting may be due to a lack of organisation. Try to be systematic in planning and organising appointments, daily activities and lifestyle aspects.
  - Have set places for objects and return things immediately when they are not in use. Store important information in a safe place, though where they are not likely to be overlooked.

- **Psychological and health factors that can also influence memory.**
  - These include mood states, such as depression, anxiety and stress. Health issues as well as medications and alcohol can also influence memory functioning.
SESSION FOUR:

Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

★ Myths About Memory

“Ageing and memory loss go hand in hand”

“Nothing can be done to stop memory loss”

“You can’t teach an old dog new tricks”

Older adults can learn new information
SESSION FOUR:

Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

☆ How Does Memory Work?

• Working Memory or Short Term Memory is a temporary memory store. It is the small amount of information that can be held in the mind at any given moment.

Most experts believe that working memory can hold no more than six or seven items. This material is discarded in five to ten seconds unless it is either continually repeated or stored in long term memory.

An example of information that is held in working memory and generally discarded without being stored is a telephone number.

Only a small amount of information that registers in working memory gets stored in long term memory.

• Long Term Memory is the memory bank. It is the largest component of the memory system and its storage space is practically limitless. It refers to any information that is no longer in conscious thought but is stored for potential recollection at a later stage.

Remembering depends on learning and storing information so that it can be retrieved at a later stage.

• In order to successfully remember something you need to:

  • Encode new information – get information into memory
  • Store new information – retain information over time
  • Retrieve information – take information out of storage
SESSION FOUR:

Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

🌟 Encoding Information

- Encoding is the process of getting information into memory.
- There are a number of steps involved in the encoding of information.
  - Encoding involves
    - Paying attention to something
    - Associating it with something already known
    - Analysing information for meaning
    - Elaborating on the details.
  - “Attention” is the first step in the process of encoding and is one of the tasks of working memory. It may require conscious effort. Focussing attention plays an important role in being able to remember information.
  - The second stage in encoding is “Association”. New information is encoded by connecting or “associating” it with other well known and relevant information already in long term memory. Much association is done unconsciously. The more effort put into creating associations the greater the ease of recall.
  - “Analysing” information for meaning and “Elaborating” on the details are also components of encoding. They result in deeper encoding and involve the processes of study and repetition.
SESSION FOUR:
Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

★ Storing Information

- The second important component of memory is the storage of new information.
- There are a number of different memory stores that house information related to general knowledge, facts, personal autobiographical details and memory for skills (e.g. driving a car). Memory is organised into different networks and connections.
- Some people may also find that they are naturally better at learning certain types of information, for example verbal/auditory versus visual material.
- Memory storage is like a complicated filing system. The better organised the information and the filing system is, the easier it will be to recall details at a later time.
SESSION FOUR:

Memory: The Basics – Misconceptions, Home Truths and all That’s in Between

🌟 Retrieving Information

· Once we have learnt new information, we need to be able to retrieve it at a later stage. You might spend some time learning the name of a new friend. You will want to make sure that you can retrieve the name of your friend when you next meet them in passing.

· Retrieval therefore, involves getting information from long term memory into consciousness.

· Retrieval is accomplished by using recognition or spontaneous recall.

· Retrieval can be triggered by cues.

· Trying to spontaneous recall information is much harder than recognition where there is a reliance on cues.
SESSION FIVE:

Improving Memory in Everyday Life
Part One
SESSION FIVE: Improving Memory in Everyday Life
Part One

Session Outline:

☆ Brief Review

☆ Memory Matters

☆ Improving Memory – Working for me, not against me

☆ The Basics

☆ Tea Break

☆ Strengthening Memories

☆ Session Close
SESSION FIVE: Improving Memory in Everyday Life
Part One

☆ Brief Review

· Pop Quiz – see handout
SESSION FIVE: Improving Memory in Everyday Life
Part One

☆ Memory Matters

- No one can remember everything and before blaming a faulty memory bear in mind that:
  - Some memories fail to enter into the memory bank in the first place; the information may not have been attended to properly in the first instance.
  - Old memories that are similar to new information may interfere with the storage of the new details.
  - Information with fewer associations and little background is harder to recall. If reading something for the first time on a novel topic, it may be harder to encode this information to recall at a later time.
  - Some information might need specific or discrete cues to be recalled. It may be easier to recall the name of a specific place, once other information related to it has been thought of.
  - Memories can fade.
  - Being mindful of some of the cognitive, psychological and health factors previously discussed and their effects on memory is also very important.
Improving Memory – Working for me, not against me

- Since there are many factors that can interfere with memory, it is important to keep a positive and open mind. Simply changing attitudes about the way memory problems are viewed can play a very important role in the ability to remember things.

- Telling oneself that it is not possible to remember a piece of information, will influence the likelihood of concentrating on the material and the chances of the information being forgotten.

- A positive attitude is the first step towards a stronger and more effective memory.
SESSION FIVE: Improving Memory in Everyday Life
Part One

★ The Basics

• If something new is trying to be remembered, it is important to make an effort to recall the details in the first place. The brain prioritises information by meaning, value and relevance. Motivation and personal relevance of information will influence ability to remember something.

• Also consider the amount of information trying to be remembered. If lots of things are trying to be learnt at once, it is likely to be more difficult to remember all of the details. Determine what is most important and begin with this and then move on to more detailed information. That is, be selective in what is being learnt.

• Additionally, it is easier to learn information and recall it at a later stage if it is well organised in a meaningful way.
SESSION FIVE: Improving Memory in Everyday Life
Part One

☆ Strengthening the Memories

- The “deeper” information is processed the more likely it will be retained and recalled at a later stage.

- Deeper processing involves:
  - Rehearsing
  - Elaborating
  - Associating

  - Rehearsing information involves repeating the information several times. Regular rehearsal will make it easier to learn something new.

  - Elaborating on the information means undertaking activities such as visualisation; the process of consciously creating an image in the mind of a task, a number, a name, a word or a thought.

  - Associating information involves relating the information with something already known. It is the process of forming mental connections between what you want to remember and what you already know. The conscious creation of an association is an excellent strategy for encoding new information. Associations are useful if trying to remember such things as the name of a neighbour; the street where a friend lives; the title of a movie/book, street directions; the bus number to a shopping centre.
SESSION SIX:

Improving Memory in Everyday Life
Part Two
SESSION SIX: Improving Memory in Everyday Life
Part Two

Session Outline:

☆ Brief Review

☆ Using Strategies Every Day

☆ Tea Break

☆ Using Strategies Every Day
   ☆ Review of Association

☆ Using Strategies Every Day
   ☆ Review of Selective Attention

☆ Take Home Messages

☆ Session Close
SESSION SIX: Improving Memory in Everyday Life
Part Two

☆ Brief Review

• Pop Quiz – see handout
SESSION SIX: Improving Memory in Everyday Life
Part Two

☆ Using Strategies Every Day

· Strategies take thought and practice. The more often strategies are incorporated into everyday life the easier it will become to learn and remember new information.

· Additionally, the more often one practices using strategies, the more automatic they will become.

· Examples of such strategies are the techniques of visualisation and association.

· *Visualisation* is the process of consciously creating an image in your mind of a task, a number, a name, a word or a thought. Focussing your attention on a clear image of an object will help you carry it in your mind long after you first perceived it.

· For example, stop and think when you place an object down. Create a visual image in your mind of the object and where it is.

· *Association* involves relating/connecting new information to something already known.

· For example, you might want to recall a conversation you have with someone. During the conversation, think about the information you are being told and associate it with other information you know or things you have personally experienced.
SESSION SIX: Improving Memory in Everyday Life
Part Two

🌟 Using Strategies Every Day

- **Selective Attention**
  
  - Selective attention involves being attentive to whatever is selected (or chosen) to concentrate on. You will remember best, the things that you specifically pay attention to.
  
  - For example, if you went to a movie and you wanted to remember the details to tell your friend the next day, you should go to the movie keeping a few questions in mind such as:
    
    - What is the main genre (eg. comedy, thriller, romance)?
    - Where is the story set?
    - Who are the lead actors/actresses?
  
  - Ask yourself these questions during and again immediately after the film and think about your reasons for each response.
  
  - If there was important information in an article that you were trying to remember, pick out the key points that are important to you and focus on those.

  The more analysis, the stronger the memory. Active selection of what you want to analyse is very important. You can choose to focus on some things and leave other things out. This reduces memory burden. The elements you focus on and analyse, you should have greater ease trying to remember.
SESSION SIX: Improving Memory in Everyday Life
Part Two

Take Home Messages

- Practice is a key component in memory tasks. Practice increases familiarity and improves speed as well. It also allows a person to develop memory strategies that can be useful for remembering a lot of detail.

- Write it down – Use lists, schedules and diaries to record information. Making lists aids careful consideration of the information and may also lead to better organisation of the material (e.g. writing a shopping list by categories or by sections of the store).

- Put things in the same place – have a set place for items and get into the habit of putting things away immediately after using them.

- Repeat information – if told something important that can’t be written down, repeat the information and visualise it. Associate and relate it to something else already known or that needs doing.

- Make associations – for example if trying to remember something needed to be bought at the store, think about what the object is actually going to be used for and in what context.

- Use Triggers – For example, place items near the door the night before if they are needed to be taken the next day.

- In general:
  - Choose something specific you want to remember
  - Review the possible techniques and select one
  - Try the technique
  - If the chosen technique doesn’t work try something else
  - Don’t feel defeated if some things are particularly hard to remember
SESSION SEVEN:

Back to Basics
SESSION SEVEN: Back to Basics

Session Outline:

- Brief Review
  - Homework Activities
  - Attention, Processing Speed and Executive Functions

- Tea Break

- Exercise Activities

- Session Close
SESSION SEVEN: Back to Basics

★ Brief Review

- Group Discussion Homework Activities
- Exercise Activities Reviewing Role of Attention, Processing Speed and Executive Functions.
SESSION SEVEN: Back to Basics

☆ Exercise Activities Reviewing Memory Strategies
SESSION EIGHT:

Language Processes - “On the Tip of my Tongue”
SESSION EIGHT:

Language Processes - On the Tip of my Tongue

Session Outline:

◆ Ageing and Language Skills
◆ Is it a Problem with my Memory?
◆ How do I find the Words?
◆ Tea Break
◆ Exercise Activities
◆ Session Close
SESSION EIGHT:

Language Processes - On the Tip of my Tongue

Ageing and Language Skills

- Research shows that as we age there are changes in our expressive language abilities. These changes are only slight, though become more apparent after the age of 70.

- We have all experienced the “Tip of the Tongue” (TOT) phenomenon. These are instances when a person feels they know the name of an object, person or place, yet the word just won’t come to them. This can lead to anxiety, which then makes it harder to recall the information that is being searched for.

- The TOT experience was first examined experimentally in the 60s by Brown and McNeill who referred to the feeling as:

  “…analogous to being on the brink of a sneeze: a sense of mild torment, followed by considerable relief when the act is finally accomplished.”
SESSION EIGHT:

Language Processes - On the Tip of my Tongue

☆ Is it a Problem with my Memory?

- There are many different types of memory systems within the brain. We have already talked about working memory and long term memory. Another form of memory is Semantic memory.

- Semantic Memory or World Knowledge is the pool of information acquired over a lifetime from both educational and everyday experiences. It accumulates with age. In tests that measure knowledge and vocabulary, older adults do as well or better than younger people, it just may take older adults greater effort to retrieve the information they are looking for.

- Therefore, in instances when we experience the TOT phenomenon, it may not necessarily be a problem with memory, but a problem with word retrieval.
SESSION EIGHT:

Language Processes - On the Tip of my Tongue

★ How do I Find the Words?

- Strategies/techniques to adopt to assist with word-finding:

  - The next time you find yourself searching for a name/word try to relax, take a deep breath and think of related items. If you still can’t retrieve it, try not to worry, it will likely come at a later time, probably when you are thinking of something else.

  - Keep in mind that it also takes longer for older adults to recall the information they need, so try not to become impatient if the information doesn’t come to mind immediately. Expertise and familiarity in a specific area often more than compensate for the slowing down of recall.

  - If specific words or terms are trying to be learnt, start a list with the correct definitions. Keep this handy, for example in a diary/memory book. Regularly refer to this and try to incorporate the words into everyday conversation as much as possible. This will help to remember them.

  - Practice activities that challenge word knowledge. Undertake crosswords of varying complexity; complete word puzzles and quizzes. Reading is another way to keep one’s vocabulary in check.
SESSION EIGHT:

Language Processes - On the Tip of my Tongue

★ Exercise Activities

See Handouts
SESSION NINE:

Maintaining the Mind and Sharpening the Tools
SESSION NINE:
Maintaining the Mind and Sharpening the Tools

Session Outline:

☆ Keeping Mentally Fit

☆ Applying the Knowledge

☆ Tea Break

☆ Exercise Activities

☆ Session Close
Promoting Healthy Ageing with Cognitive Exercise (PACE)

SESSION NINE:

Maintaining the Mind and Sharpening the Tools

⭐ Keeping Mentally Fit

· Research is continually exploring the idea of “Use it or lose it” and at present, there is some suggestion that by continually challenging and using our cognitive abilities, we can maintain our mental capacities well into older age.

· How can we keep our mind’s health and the aging processes at bay:

  · Healthy, balanced diets
  · Exercise
  · Good sleep hygiene
  · Being mindful of the effects of mood and psychological issues
  · Engaging in mental activity
Promoting Healthy Ageing with Cognitive Exercise (PACE)

SESSION NINE:
Maintaining the Mind and Sharpening the Tools

★ Applying the Knowledge

Group Discussion Reviewing Memory Techniques
SESSION NINE:

Maintaining the Mind and Sharpening the Tools

☆ Exercise Activities

See Handouts
SESSION TEN:

Final Review and Closing
SESSION TEN: Final Review and Closing

Session Outline:

★ Reviewing Concepts: Attention, Processing Speed and Executive Functions

★ Reviewing Concepts: Memory Functions

★ Tea Break

★ Reviewing Concepts: Language Abilities

★ Closing Comments

★ Session Close
SESSION TEN: Final Review and Closing

★ Reviewing Concepts: Attention, Processing Speed and Executive Functions

Group Discussion

Exercise Activities – See Handouts
SESSION TEN: Final Review and Closing

☆ Reviewing Concepts: Memory Functions

Group Discussion

Exercise Activities – See Handouts
SESSION TEN: Final Review and Closing

☆ Reviewing Concepts: Language Abilities

Group Discussion

Exercise Activities – See Handouts
SESSION TEN: Final Review and Closing

💫 Closing Comments

- Thank you all for participating across the 5 weeks. We hope you have found the sessions enjoyable and have changed some of your views about your cognitive abilities.

- We encourage you to continue to use the information that you have been taught and periodically review the summary handouts for each of the sessions. Continue using your memory notebooks and incorporating this into your daily routine.

- You will be invited to attend for your follow-up testing so that we can look to see whether there has been any change in your cognitive performance over the course of our program.

- You will also be contacted in six months time so that we can see how you have progressed with your use of the strategies we have talked about. This will also be an opportunity for you to discuss any difficulties or challenges you may have noticed trying to incorporate the information we have learnt.

- In twelve months time we will contact you to visit us again so that we can complete the testing process and finalise your involvement in the study.

THANK YOU
MEMORY NOTEBOOK

Section One: DIARY: MONTHLY PLANNER
Section Two: IMPORTANT DATES
Section Three: TO DO LIST
Section Four: PERSONAL CONTACTS
Section Five: MEDICATIONS
Section Six: BILLS/ACCOUNTS
Section Seven: GROCERY LIST
Section Eight: TRAVEL INFORMATION
Section Nine: OTHER
## MONTHLY PLANNER

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Promoting Healthy Ageing with Cognitive Exercise (PACE)
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*Promoting Healthy Ageing with Cognitive Exercise (PACE)*
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*Promoting Healthy Ageing with Cognitive Exercise (PACE)*
### Monthly Planner

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**Notes**

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*Promoting Healthy Ageing with Cognitive Exercise (PACE)*
## Monthly Planner

### November 2008

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**Notes**
# MONTHLY PLANNER

## December 2008

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**Notes**
**IMPORTANT DATES 2008**

**WA Public Holidays**

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<th>Date</th>
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<tr>
<td>New Year's Day</td>
<td>Tuesday 1st January</td>
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<tr>
<td>Australia Day</td>
<td>Monday 28th January</td>
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<tr>
<td>Labour Day</td>
<td>Monday 3rd March</td>
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<td>Good Friday</td>
<td>Friday 21st March</td>
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<tr>
<td>Easter Monday</td>
<td>Monday 24th March</td>
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<td>Anzac Day</td>
<td>Friday 25th April</td>
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<td>Foundation Day</td>
<td>Monday 2nd June</td>
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<td>Queen’s Birthday</td>
<td>Monday 29th September</td>
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<td>Christmas Day</td>
<td>Thursday 25th December</td>
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<td>Boxing Day</td>
<td>Friday 26th December</td>
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**Personal**

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### IMPORTANT DATES

**Birthdays/Anniversaries**

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**THINGS TO DO TODAY...**

**DATE:**

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<th>Task (in order of priority)</th>
<th>Completed (tick)</th>
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**NOTES**
**Important Contact Numbers**

**Emergency**

Ambulance, Fire and Police: 000

Family Member:

**Medical (eg. General Practitioner; Health Care Specialists)**

<table>
<thead>
<tr>
<th>Name</th>
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**Family/Friends**

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**Other**

Police (general inquiries - nonemergency): 131 444

Black & White Taxis: 13 1008

Swan Taxis: 13 1330

Transperth Information Line: 13 6213
**Medications**

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<th>Name of Drug or Medicine</th>
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**Notes**

_________________________________________________________________
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_________________________________________________________________
Promoting Healthy Ageing with Cognitive Exercise (PACE)

Household Bills:

Accounts to be paid
Filed in order of priority
Due dates to be entered and marked on monthly calendar
Promoting Healthy Ageing with Cognitive Exercise (PACE)

*Household Bills: Accounts Settled*

*Documents now ready to be filed away for future reference*
# Grocery List

<table>
<thead>
<tr>
<th>Fresh vegetables</th>
<th>Bakery Items</th>
<th>Dairy</th>
<th>Personal Care</th>
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<tr>
<td>Refrigerated Items</td>
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<td>Condiments/spreads</td>
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<td>Cleaning products</td>
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<td>Fresh Fruit</td>
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<td>Frozen goods</td>
<td>Other</td>
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<td>Meat/Seafood</td>
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<td>Snacks</td>
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<td>Deli Items</td>
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TRAVEL

Maps

Timetables

Contact Numbers
OTHER

Important Documents

Paperwork
Promoting Healthy Ageing with Cognitive Exercise (PACE)
Appendix C: Cognitive Activity Group Stimuli
Promoting Healthy Ageing with Cognitive Exercise

The PACE Study: A Randomised Control Trial of Cognitive Activity for Older Adults with Mild Cognitive Impairment

Cognitive Activity Intervention

GROUP EXERCISE ACTIVITIES
Session One: Introduction

Outline of Group Exercise Activities

1.1 GROUP EXERCISE ACTIVITY:
Group Interviews

1.2 GROUP EXERCISE ACTIVITY:
Group Presentations

1.3 GROUP EXERCISE ACTIVITY:
Interview Quiz
1.1 GROUP EXERCISE ACTIVITY:
Facilitator to divide up group and hand out sheets. Group Members to take ten minutes to record details about each other.

1.2 GROUP EXERCISE ACTIVITY:
Group Presentations
Session One: Getting to Know You Interview Sheet

(Group Exercise Activity 1.1 & 1.2)

Name of Interviewee: ________________________________

Questions:

1. “What do you enjoy most about retirement?”

2. “What do you enjoy least about retirement?”

3. “What are your favourite pastimes? (Max. three responses)”

4. “If you could be an animal, what would you choose and why?”
1.3 GROUP EXERCISE ACTIVITY: Interview Quiz
Session One: Getting to Know You Interview Sheet

(Group Exercise Activity 1.3)

Facilitator to quiz group on responses to interview questions

Questions:

1. “What do you enjoy most about retirement?”

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<th>Answer:</th>
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2. “What do you enjoy least about retirement?”

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3. “What are your favourite pastimes? (Max. three responses)”

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<th>Answer:</th>
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4. “If you could be an animal, what would you choose and why?”

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<th>Answer:</th>
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Outline of Group Exercise Activities

**2.1 GROUP EXERCISE ACTIVITY:**
Task of Divided Attention

**2.2 GROUP EXERCISE ACTIVITY:**
Task of Divided and Sustained Attention

**2.3 GROUP EXERCISE ACTIVITY:**
Processing speed task

**2.4 GROUP EXERCISE ACTIVITY:**
Processing speed task repeated

**2.5 GROUP EXERCISE ACTIVITY:**
Card Sorting Task

**2.6 GROUP EXERCISE ACTIVITY:**
Card Sorting Task repeated
2.1 GROUP EXERCISE ACTIVITY:

Divided Attention

String of numbers presented on screen to group.

“I would like you to silently add a string of numbers and at the same time, continually recite out aloud, the months of the year:

Here are the numbers”

4, 8, 5, 7, 9 =

The answer is 33.
2.2 **GROUP EXERCISE ACTIVITY:**

**Divided and Sustained Attention:**

“I would like you all to listen to a piece of audio of a person who is reading an article about a writer – Alice Munro.

Listen carefully and record the amount of times you hear the target word “animal” which has been inserted in the audio at different points in the story.

**Play audio… Recording is approximately five minutes long.**

Now how many of the target words “animal” did you count…?

Target word “animal” heard 13 times.

Can any of you actually recall any of the issues raised in the story?

This also demonstrates how difficult it is to pay attention and to do multiple tasks at once. It is a good example of how attention can influence our ability to process information and the effects of attention on comprehension and memory.”
2.3 GROUP EXERCISE ACTIVITY:
Processing speed task

RECORD TIME TO COMPLETE ACTIVITY
Activity 2.3

Complete the following exercise as quick as you can by writing, on the line, the letter “S” if the two symbols are the same and the letter “D” if the two symbols are different. Remember, be as quick as you can without mistakes.

2.4 GROUP EXERCISE ACTIVITY:
Processing Speed Task from activity 2.3.

RECORD TIME TO COMPLETE ACTIVITY
Activity 2.4

Complete the following exercise as quick as you can by writing, on the line, the letter “S” if the two symbols are the same and the letter “D” if the two symbols are different. Remember, be as quick as you can without mistakes.
2.5 GROUP EXERCISE ACTIVITY:
Card Sorting Activity

“Here is a set of cards. I want you to sort the cards into the numbered groups that they belong to. The cards will have the numbers 1 to 4 on them and you need to make piles containing only the cards numbered with “1”, those numbered with “2”, those numbered with “3” and those numbered “4”.

I want you to go as quickly as you can, but without mistakes.”

(Cards to have distracting material on them, such as extra lines, colour patterns etc. The sorting will take longer due to the distracting material on the cards).
2.6 GROUP EXERCISE ACTIVITY: Card Sorting Activity

“We are going to do the same exercise again. I want you to again sort the cards into numbered piles, of either 1, 2, 3 or 4.

Again, I want you to go as quickly as you can.”

(Cards to have numbers only. Task is easier as just numbers on plain cards).

“As you can see, this was much easier to do the second time around, when we were using cards that had no distracting stimuli on them.”
3.1 GROUP EXERCISE ACTIVITY: Instruction Recall

3.2 GROUP EXERCISE ACTIVITY: List Recall

3.3 GROUP EXERCISE ACTIVITY: Memory Book Creation
3.1 GROUP EXERCISE ACTIVITY:
Instruction Recall

Present list of instructions that are in an illogical sequence and ask the group to recall the details.

Following this, give similar type of instructions in a logical sequence and demonstrate the difference in the ease with which they can remember.
Activity 3.1

Part A: I’m going to read a set of instructions that I want you to try to remember. You are to remember them in the order I read them; Don’t write them down and do the best you can as I am going to ask you to repeat them back to me:

6. Spread jam on toast
4. Remove toast from toaster
3. Open fridge and remove butter and jam
1. Take bread out of the packet
2. Place bread in toaster
5. Spread butter on toast

What were those six instructions? Call them out whenever you are ready.

Part B. Now let’s try again, placing things in a logical, well organised sequence.

1. Take bread out of the packet
2. Place bread in toaster
3. Open fridge and remove butter and jam
4. Remove Toast from toaster
5. Spread butter on toast
6. Spread jam on toast

What were those six instructions? Do you see what a difference logical order and organisation can make in terms of your ability to recall information? Placing the instructions in a manner which mimicked the way you would logically perform the task made it much easier for you to try to recall all of the details.


3.2 GROUP EXERCISE ACTIVITY:
List Recall

Grocery shopping list presented for recall.

List presented again, though organised into semantic categories with items in alphabetical order within categories.
Activity 3.2

Part A

I am going to read a list of grocery items. I want you to remember these words, though this time, in any order that you like. I don’t want you to write them down. Are you read, you are trying to remember these words, in any order…Here we go:

Shampoo
Capsicum
Milk
Soap
Beans
Ice cream
Perfume
Tomatoes
Yoghurt

What were those words?

Part B. Now let’s try again, placing the items in a logical, well organised sequence and thinking about the categories they belong to. I’m going to read the same list of words again, except they are in a more organised sequence. Try to remember them:

Perfume
Shampoo
Soap

Ice cream
Milk
Yoghurt

Beans
Capsicum
Tomatoes

What were those words? Call them out whenever you are ready.

Again, can you see how much more effective your memory can be when information you are trying to recall is well organised?

How many of you write your shopping lists in this way; organising the items into their categories?
Activity 3.2

Part A

Let’s try that again using a list of grocery items. I want you to remember these words, though this time, in any order you like

- Shampoo
- Capsicum
- Milk
- Soap
- Beans
- Ice cream
- Perfume
- Tomatoes
- Yoghurt

What were those words?

Part B. Now let’s try again, placing the items in a logical, well organised sequence and thinking about the categories they belong to.

- Perfume
- Shampoo
- Soap
- Ice cream
- Milk
- Yoghurt
- Beans
- Capsicum
- Tomatoes

What were those words?
3.3 GROUP EXERCISE ACTIVITY: 
Memory Book Creation

“We are going to look at a memory note book with different sections to assist with remembering every
day types of activities.

Each notebook is going to have the following sections –

A diary

Daily activity/to do section

Anniversaries/important dates

Important personalised contact numbers

Medications list

Grocery/shopping lists

Bills (due and paid)

Travel section

In general, you could organise this any way that you liked.

We will go through each section and you can see how it can be used and to fill in information that is
personally relevant to you.”
4.1 GROUP EXERCISE ACTIVITY:
Digit Span

4.2 GROUP EXERCISE ACTIVITY:
STM vs LTM

4.3 GROUP EXERCISE ACTIVITY:
Story Reading (Difficult & Easy – using distractors)

4.4 GROUP EXERCISE ACTIVITY:
Story Recall (Difficult & Easy – using technical information)

4.5 GROUP EXERCISE ACTIVITY:
List Recall
4.1 GROUP EXERCISE ACTIVITY: 
  Digit Span

Demonstration of working memory (Complete series of Digit Span Examples).

“I’m going to say a series of numbers and I want you to repeat back what I say. I don’t want you to write the numbers down and I’m not going to repeat them. Are you ready?”

4-7-9  Response
6-3-0-5  Response
8-4-3-1-7  Response
9-2-1-5-7-8  Response
“What were those strings of numbers we just repeated? It’s difficult to remember them isn’t it?

Now, I want you to think of an important life event from your past such as your wedding day, the birth of your first child; the day you retired.

It is much easier to recall information from your long term memory. This information was initially stored away, however you did not have the opportunity to try to store the strings of numbers and they were quickly lost from your working memory.”
4.3 GROUP EXERCISE ACTIVITY:
   Story Reading (Difficult & Easy – using distractors)


I am going to ask each of you to read the following passage:

“The car ride was getting bumpy now that George had left the main road to use the dirt road. He was out of school, not having to study during the summer break. He was glad to get out of the stuffy offices of the archaeology department and get out into…”

Now I’m going to show you the same passage again. This time I want you to read only the italicised words and try to ignore the others.

“The car ride river was getting bumpy jeep now that religious George had religious left the main digging tools road to use the religious dirt road. He digging tools river was out of jeep school, not having digging tools to study digging tools river during the summer jeep religious break. He was jeep river glad to digging tools get out of jeep the stuffy religious offices river of religious the archaeology religious department river jeep and get out into…”

Most people find that the irrelevant words in the passage are distracting and slow down reading rate, as well as making it more difficult to follow the thread of the story.

This in turn makes it harder for you to encode the information and to understand what you are reading.
Story Reading


“The car ride was getting bumpy now that George had left the main road to use the dirt road. He was out of school, not having to study during the summer break. He was glad to get out of the stuffy offices of the archaeology department and get out into…”

Below is the same passage. This time read only the italicised words and try to ignore the others.

“The car ride river was getting bumpy jeep now that religious George had religious left the main digging tools road to use the religious dirt road. He digging tools river was out of jeep school, not having digging tools to study digging tools river during the summer jeep religious break. He was jeep river glad to digging tools get out of jeep the stuffy religious offices river of religious the archaeology religious department river jeep and get out into…”

Most people find that the irrelevant words in the passage are distracting and slow down reading rate, as well as making it more difficult to follow the thread of the story.
4.4 GROUP EXERCISE ACTIVITY:
Story Recall (Difficult & Easy – using technical information)

Present example of difference in trying to recall familiar information versus trying to recall technical or unfamiliar information.

Part A: DIFFICULT STORY

Fuel injection often produces more power than an equivalent carbureted engine. However, fuel injection alone does not increase maximum engine output. Increased airflow is needed to burn more fuel to generate more heat to generate more output. The combustion process converts the fuel's chemical energy into heat energy, whether the fuel arrived via electronic fuel injection or via a carburetor.

Part B: EASY STORY

John Kennedy, was the 35th President of the United States and was considered an icon for generations of Americans. He served from 1961 until his assassination in 1963. Lee Harvey Oswald, charged with the crime, was himself murdered two days later before a trial could be convened. The assassination is a defining moment in U.S. history.

The story about JFK is easier to remember and follow because you can associate the information with what you already know. As I’m reading the story to you, you are already making connections with your previously stored memories about JFK.
Story Recall

(Information adapted from Wikipedia on the world wide web)

Part A: DIFFICULT STORY

Fuel injection often produces more power than an equivalent carbureted engine. However, fuel injection alone does not increase maximum engine output. Increased airflow is needed to burn more fuel to generate more heat to generate more output. The combustion process converts the fuel's chemical energy into heat energy, whether the fuel arrived via electronic fuel injection or via a carburetor.

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The story about JFK is easier to follow and understand, because it is something we tend to be more familiar with.
4.5 GROUP EXERCISE ACTIVITY: List Recall

“I am going to read a list of animals that I want you to remember. I don’t want you to write them down. Just do the best you can; you can remember them in any order that you like”.

Butterfly
Lion
Ape
Cheetah
Mosquito
Bee
Monkey
Jaguar
Orang-utan

What were those words?

Part B. Now let’s try again, placing the items in their semantic groups. The semantic groups are Insects, Primates and Big Cats. Think about these categories and the items, as the list is read and the benefits associated with organisation.

Bee
Butterfly
Mosquito

Ape
Monkey
Orang-utan

Cheetah
Jaguar
Lion

“You would have found it easier to remember the animals this time, once you thought about the categories they belong to – Insects, Primates and Big Cats. Knowing also that there was three animals in each group, should also have helped.”
WORD LIST LEARNING

Part A

Remember these words in any order you like:

Butterfly
Lion
Ape
Cheetah
Mosquito
Bee
Monkey
Jaguar
Orang-utan

What were those words?

Part B. Now try again, placing the items in their semantic groups. The semantic groups are Insects, Primates and Big Cats. Think about these categories and the items, as the list is read.

Bee
Butterfly
Mosquito

Ape
Monkey
Orang-utan

Cheetah
Jaguar
Lion
**4.6 GROUP EXERCISE ACTIVITY:**
**Story Recall vs Recognition**

I’m going to read a story to you. I want you to listen carefully, because after I have read the story to you, I am going to ask you some questions about it.

**ANABOLIC STEROIDS**

Athletes have used anabolic steroids since the 1950s and they were highlighted by the exceptional performance of Soviet athletes during the 1956 World Games in Moscow.

Anabolic steroids are derivatives or synthetic models of the male sex hormone, testosterone, and can be traced back to the 1930s when scientists created the synthetic form of testosterone to treat medical conditions. The drug was later used during World War II to help sick soldiers gain weight and improve performance, and it was later refined for use by athletes.

During the 1970s steroids became increasingly popular among Olympic and recreational athletes but had devastating side effects. In 1974 the International Olympic Committee banned their use.

Some athletes continue to use anabolic steroids despite them being considered a restricted substance. Side effects range from acne to aggression, impotence and the formation of breasts in men.

**Spontaneous Recall Questions**

1. What are anabolic steroids the derivatives of? *Male sex hormone testosterone*
2. Why were steroids used during World War II? *To gain weight and improve performance*
3. In what year did the International Olympic Committee ban the use of steroids? *1974*

**Cued Recall Questions**

1. Are anabolic steroids the derivatives of Progesterone or Testosterone?
2. Were steroids used during Word War II – Yes or No?
3. The International Olympic Committee banned the use of steroids. Was this in 1974 or 1984?
ANABOLIC STEROIDS

Athletes have used anabolic steroids since the 1950s and they were highlighted by the exceptional performance of Soviet athletes during the 1956 World Games in Moscow.

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Some athletes continue to use anabolic steroids despite them being considered a restricted substance. Side effects range from acne to aggression, impotence and the formation of breasts in men.

Spontaneous Recall Questions

1. What are anabolic steroids the derivatives of?
2. Why were steroids used during World War II?
3. In what year did the International Olympic Committee ban the use of steroids?

Cued Recall Questions

4. Are anabolic steroids the derivatives of Progesterone or Testosterone?
5. Were steroids used during Word War II – Yes or No?
6. The International Olympic Committee banned the use of steroids. Was this in 1974 or 1984?
Outline of Group Exercise Activities

5.1 GROUP EXERCISE ACTIVITY: Quiz

5.2 GROUP EXERCISE ACTIVITY
Selective Attention: Story recall exercise

5.3 GROUP EXERCISE ACTIVITY
Meaningful organisation: Word List Learning Task

5.4 GROUP EXERCISE ACTIVITY: Visualisation Task

5.5 GROUP EXERCISE ACTIVITY: Association and Visualisation Task
Activity 5.1: Pop Quiz Questions

1. Which three cognitive domains change as we get older and can influence memory performance?

2. “Those who fail to plan, plan to fail”. How is the saying relevant to memory?

3. A number of factors can impact on memory. List two psychological issues that can influence memory performance.

4. How does “working memory” differ from “long term memory”?

5. What are the three processes involved in trying to remember something new?
Activity 5.1: Pop Quiz Questions ANSWERS

6. Which three cognitive domains change as we get older and can influence memory performance?

<table>
<thead>
<tr>
<th>Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing Speed</td>
</tr>
<tr>
<td>Executive Functions</td>
</tr>
</tbody>
</table>

7. “Those who fail to plan, plan to fail”. How is the saying relevant to memory?

Planning and organisation play a key role in memory functioning

8. A number of factors can impact on memory. List two psychological issues that can influence memory performance.

Negative thinking/attitudes, Grief, Anxiety, Stress, Depression

9. How does “working memory” differ from “long term memory”?

WM = temporary memory store; can only hold a small amount of information
LTM = the memory bank, largest component of memory, information is stored for recollection at a later stage

10. What are the three processes involved in trying to remember something new?

Encoding, Storage and Retrieval
**5.2 GROUP EXERCISE ACTIVITY**

**Selective Attention: Story recall exercise**

“*I’m going to read a story to you about Anne Frank. I want you to listen carefully to the story. There are three details I want you to try to remember. I’m not going to ask you about the whole story, you only need to listen for three facts which I am going to quiz you on at the end.*

Here are the three things you should try to remember.

Firstly, you need to remember when Anne and her family moved to Amsterdam.

Secondly, I want you to remember how many years the family was in hiding.

Thirdly, I want you to remember what Anne died from.

Here are the questions here to remind you.

*Listen carefully to the story now while I read it to you…*

**DIARY OF ANNE FRANK**

In 1942, a 13-year-old girl was given a notebook for her birthday and she used the book, which had a small lock on the front, as a diary. Anne Frank’s diary has become part of the record of one of the most chilling chapters in human history.

Anne was a German Jew and she and her family moved to Amsterdam in the mid 1930s to escape anti-semitism in Germany. However, with the Nazi invasion of Holland came persecution and in July 1942 the Frank family went into hiding.

For two years they remained confined, with two other families for part of that time, until they were betrayed and sent to concentration camps. Started a month before her world shrank to a few rooms, Anne’s diary is a well-written, astute and brutally honest record of her thoughts, observations and experiences. The final entry is dated August 1, 1944, just days before the family were rounded up. Anne died of typhus in March 1945 in Bergen-Belsen. After the war, her father returned to Amsterdam where Miep Gies, who had helped hide the family, gave him Anne’s diary.

All right…let’s go through the answers to the information I asked you to selectively attend to.

1. When did Anne and her family move to Amsterdam? *In the mid 1930s*
2. For how many years were the Frank family in hiding? *Two years*
3. What did Anne die from? *Typhus*

Well done everyone. By selectively attending only to the relevant information, you were able to recall the most important facts.”
Selective Attention: Story recall exercise

When reading the passage below, selectively attend, and try to remember the following three things:

1. When Anne and her family moved to Amsterdam
2. The number of years the Frank family was in hiding
3. What Anne died from

DIARY OF ANNE FRANK

In 1942, a 13-year-old girl was given a notebook for her birthday and she used the book, which had a small lock on the front, as a diary. Anne Frank’s diary has become part of the record of one of the most chilling chapters in human history.

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1. When did Anne and her family move to Amsterdam?
2. For how many years was the Frank family in hiding?
3. What did Anne die from?
5.3 GROUP EXERCISE ACTIVITY

Meaningful organisation: Word List Learning Task

“I am going to present a list of words to you that I want you to try to remember. This is similar to a task we have done previously, however you can write the words down. Use your exercise book.

I want you to think about meaningful organisation and how this assists memory. Think about some of the strategies we have discussed.

After I have read the list, you will have one minute to study the words and then I am going to test you on them.

Here are the words (words presented with a 5” gap in between each to allow participants to record their answers)

Pen
Mouth
Red
Nose
White
Pencil
Eyes
Blue
Paper

Now that you have had one minute to learn them, I am going to present you with a piece of paper and I want you to record what the words were, from your memory.

In order to have helped you learn the words, you would have performed best if you had have organised the words in a meaningful way. One way to have done this may have been:

Red
White
Blue
(Colours)

Eyes
Nose
Mouth
(Head anatomy)

Pencil
Pen
Paper
(Stationary)

How did everyone go? Were you able to remember the words?”
**5.4 GROUP EXERCISE ACTIVITY:**

**Visualisation Task**

Let’s try an example of visualisation together. You might find this easier if you close your eyes.

Say for example you wanted to recall a social event with a friend. Imagine what your friend looks like, think about their hair colour, their facial feature’s, their clothes. Now concentrate on their name. At the moment we are just focussing on what our friend looks like and their name.

Now imagine your friend with a saucer and cup in their right hand. In their left hand they are holding a sign that says 4pm Saturday.

When you think of your friend’s name this image will come to mind.
5.5 GROUP EXERCISE ACTIVITY: Association and Visualisation Task

Let’s try remembering the name of your new neighbour.

You noticed that your neighbour is always out in the garden.

Your neighbour’s name is Glen.

You could then make the association… “Glen who likes to garden.”

Now still thinking of the word association “Glen who likes to garden”, also use a visual association. You can imagine Glen surrounded by plants and flowers.

How did you all go trying to do this task?

What sorts of images did you come up with?
Outline of Group Exercise Activities

6.1 GROUP EXERCISE ACTIVITY: Pop Quiz

6.2 GROUP EXERCISE ACTIVITY: Learning Word Pairs

6.3 GROUP EXERCISE ACTIVITY: Recall of Word Pairs

6.4 GROUP EXERCISE ACTIVITY: Story recall

6.5 GROUP EXERCISE ACTIVITY: Recall of Word Pairs
Activity 6.1: Pop Quiz Questions

1. No one’s memory is perfect. Before we blame a faulty memory, what are some of the other reasons we might have trouble recalling something? List two reasons.

2. How can a positive attitude about one’s memory abilities influence your ability to remember things?

3. What sorts of things can we do to process information more deeply?

4. Describe an instance when it would be helpful to use the technique of “association”.
5. No one’s memory is perfect. Before we blame a faulty memory, what are some of the other reasons we might have trouble recalling something? List two reasons.

- Memories can fade; some memories fail to enter into the memory bank initially.
- May need discrete cues; older memories might interfere with new memories; the fewer the associations, the harder the information will be to remember.

6. How can a positive attitude about one’s memory abilities influence your ability to remember things?

- By keeping an open mind, rather than negatively thinking about your abilities, you reduce instances of setting yourself up to forget.

7. What sorts of things can we do to process information more deeply?

- Rehearse, elaborate, associate

8. Describe an instance when it would be helpful to use the technique of “association”.

- Any situation that demonstrates forming a mental connection between what they want to remember and what they already know.
6.2 GROUP EXERCISE ACTIVITY:
Learning Word Pairs

Now let’s try to remember a list of word pairs. You have thirty seconds to study the following pairs and try to remember what goes together. Ready – Start

Cat       Book
Money     Train
Clock     Chair
Radio     Mug
Bicycle   Orange
Biscuit   Eye
Lamp      Bell

What were the words that went with the pairs?

What went with cat?
What went with money?
What went with clock?
What went with radio?

It’s difficult isn’t it?

However by forming mental images and associations between the words you can organise the information and make it easier to remember.

Cat       Book
Money     Train
Clock     Chair
Radio     Mug
Bicycle   Orange
Biscuit   Eye
Lamp      Bell

For example let’s start off by visualising one item at a time and then visualising the items together.

First let’s visualise a specific cat. Now visualise a particular looking book. Now visualise the two things together, for example, the cat reading the book. Further add an emotional association “I would find it funny to see a cat reading a book”.

Next we have the pair “money - train”. We could imagine a train made of ten dollars notes speeding recklessly along a set of tracks.

“Clock – Chair” could be visualised by imaging a chair balanced precariously on a clock. The chair could seem like it is about to topple over.

“Radio – Mug”…I want you all to conger up your own images for this one. Allow 10” for each one.
Keep going with the next pairs of

“Bicycle Orange” (10”)
“Biscuit Eye” (10”)
“Lamp Bell” (10”)

Okay let’s run through them one at a time.

<table>
<thead>
<tr>
<th>Cat</th>
<th>Book – humorous image of a cat reading a book (5”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money</td>
<td>Train – out of control train made of money, speeding along the tracks (5”)</td>
</tr>
<tr>
<td>Clock</td>
<td>Chair – a chair balanced on top of a clock (5”)</td>
</tr>
<tr>
<td>Radio</td>
<td>Mug – what did you think up for this one…imagine it now (5”)</td>
</tr>
<tr>
<td>Bicycle</td>
<td>Orange - what did you think up for this one…imagine it now (5”)</td>
</tr>
<tr>
<td>Biscuit</td>
<td>Eye - what did you think up for this one…imagine it now (5”)</td>
</tr>
<tr>
<td>Lamp</td>
<td>Bell - what did you think up for this one…imagine it now (5”)</td>
</tr>
</tbody>
</table>

Okay I’m going to say the first word of each pair and I want you all to think of the answer and when you feel confident call out the answer…here we go…

“Cat goes with…” (Book)
“Money goes with…” (Train)
“Clock goes with…” (Chair)
“Radio goes with…” (Mug)
“Bicycle goes with…” (Orange)
“Biscuit goes with…” (Eye)
“Lamp goes with…” (Bell)

Excellent…well done everybody…We are going to do this again a little later on…try to remember them.
6.3 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs

Now let’s try to remember the list of word pairs we learnt earlier.

Okay I’m going to say the first word of each pair and I want you all to think of the answer and when you feel confident call out the answer…here we go…

“Cat goes with…” (Book)
“Money goes with…” (Train)
“Clock goes with…” (Chair)
“Radio goes with…” (Mug)
“Bicycle goes with…” (Orange)
“Biscuit goes with…” (Eye)
“Lamp goes with…” (Bell)

Excellent…well done everybody…We are going to do this again at the end of the session…let’s see how many we can remember a little later on.
6.4 GROUP EXERCISE ACTIVITY:

Story recall

We are going to do a task similar to one we have tried previously. I’m going to read a story to you about the Leaning Tower of Pisa. I want you to listen carefully to the story.

There are three details I want you to try to remember. I’m not going to ask you about the whole story, you only need to listen for three facts which I am going to quiz you on at the end.

Here are the three things you need to remember.

Firstly, you need to remember the year that the Leaning Tower of Pisa was completed.

Secondly, I want you to remember how tall it is.

Thirdly, I want you to remember the year it closed for construction work.

Here are the questions here to remind you.

Listen carefully to the story now while I read it to you…

“One of the most iconic tourist attractions in the world, the Leaning Tower of Pisa has fascinated people since its completion in 1372.

Considered one of the seven wonders of the modern world, the ground beneath the tower started to sink after construction began in 1173. Building continued, with two long interruptions due to wars, for almost 200 years.

More than 55 metres tall, the completed tower is built entirely of marble and is a fine example of Romanesque architecture.

Since measurement began in 1911, the tower has increased its lean by 1.25mm a year.

The tower was closed in 1990 for construction work, because it was in danger of toppling over. Earth was extracted from beneath the foundations of the high end, correcting the lean by 45cm. Tourists once again entered the tower in 2001, when the $US 25 million construction project was completed. Engineers say it should now survive for another 300 years at least.”

All right…let’s go through the answers to the information I asked you to selectively attend to.

Firstly, what year was the Leaning Tower of Pisa was completed? 1372
Secondly, how tall is the Leaning Tower of Pisa? 55 metres
Thirdly, what year did it close for construction work? 1990

Well done everyone. By selectively attending only to the relevant information, you were able to recall the most important facts.
Selective Attention: Story recall exercise

When reading the passage below, selectively attend, and try to remember the following three things:

1. What year was the Leaning Tower of Pisa completed?
2. How tall is the Leaning Tower of Pisa?
3. What year did it close for construction work?

“One of the most iconic tourist attractions in the world, the Leaning Tower of Pisa has fascinated people since its completion in 1372.

Considered one of the seven wonders of the modern world, the ground beneath the tower started to sink after construction began in 1173. Building continued, with two long interruptions due to wars, for almost 200 years.

More than 55 metres tall, the completed tower is built entirely of marble and is a fine example of Romanesque architecture.

Since measurement began in 1911, the tower has increased its lean by 1.25mm a year.

The tower was closed in 1990 for construction work, because it was in danger of toppling over. Earth was extracted from beneath the foundations of the high end, correcting the lean by 45cm. Tourists once again entered the tower in 2001, when the $US 25 million construction project was completed. Engineers say it should now survive for another 300 years at least.”

1. What year was the Leaning Tower of Pisa completed?
2. How tall is the Leaning Tower of Pisa?
3. What year did it close for construction work?
6.5 GROUP EXERCISE ACTIVITY:
Word Pairs Recall

Okay I’m going to say the first word of each pair and I want you all to think of the answer and when you feel confident call out the answer…here we go…

“Cat goes with….” (Book)
“Money goes with…” (Train)
“Clock goes with…” (Chair)
“Radio goes with…” (Mug)
“Bicycle goes with…” (Orange)
“Biscuit goes with…” (Eye)
“Lamp goes with…” (Bell)

Excellent…well done everybody…

This is a good example, of how initially you thought it was quite a daunting task to try to learn the information, however with practice and the use of strategies you can break down the information, make it more manageable and remember it over time.
Session Seven: Back to Basics (Review)

Outline of Group Exercise Activities

7.1 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs

7.2 GROUP EXERCISE ACTIVITY:
Audio Tape Presentation

7.3 GROUP EXERCISE ACTIVITY:
Word List Learning Task

7.4 GROUP EXERCISE ACTIVITY:
Facts Recall

7.5 GROUP EXERCISE ACTIVITY:
Visual Paired Associates Recall
7.1 GROUP EXERCISE ACTIVITY:
Recall of word pairs.

Last week we learnt a set of word pairs by using the techniques of visualisation and association. I’m going to say the first word of each pair that we learnt and I want you to write down what you think the answer is…here we go…

“Cat goes with…”
“Money goes with…”
“Clock goes with…”
“Radio goes with…”
“Bicycle goes with…”
“Biscuit goes with…”
“Lamp goes with…”

Let’s run through them and see how well you did.

<table>
<thead>
<tr>
<th>Pair 1</th>
<th>Pair 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat</td>
<td>Book</td>
</tr>
<tr>
<td>Money</td>
<td>Train</td>
</tr>
<tr>
<td>Clock</td>
<td>Chair</td>
</tr>
<tr>
<td>Radio</td>
<td>Mug</td>
</tr>
<tr>
<td>Bicycle</td>
<td>Orange</td>
</tr>
<tr>
<td>Biscuit</td>
<td>Eye</td>
</tr>
<tr>
<td>Lamp</td>
<td>Bell</td>
</tr>
</tbody>
</table>
7.2 GROUP EXERCISE ACTIVITY:

Audio Tape Presentation

I would like you all to listen to a piece of audio of a person who is reading an article about pregnancy.

Listen carefully and record the amount of times you hear the target word “water” which has been inserted in the audio at different points in the story.

I also want you to tell me three diseases mentioned in the story.

You can write all of the answers down in your exercise books.

Play audio…Recording is approximately two minutes long.

Now how many of the target words “water” did you count…?

Target word “water” heard 8 times.

Diseases: Obesity, hypertension, cardiovascular disease, diabetes

Excerpt taken from Life etc Magazine pg. 17 Mar/Apr 2006.

Should Pregnant Women Eat for Two?

“While pregnant water women gain, on average, 10kg over nine months, just how much weight gain is healthy is controversial. According to water consumer choice website choice.com.au, rather than adopt an anything-goes approach, nutritionists say pregnant women should make sure they eat three balanced water meals a day.

Using pregnancy as an excuse to eat up, eating more water to have a big, bouncing baby – or not eating enough in the hope of maintaining your figure or having a small baby and easier birth – can affect both your water baby’s health and yours. If you put on more than 15kg, the extra weight is often harder to shed and can lead to obesity, the website says. And there’s increasing evidence that poor nutrition in pregnancy can increase your child’s risk of becoming obese and suffering from diseases such as hypertension, cardiovascular disease and diabetes in later life.

According to water nutritionist Rosemary Stanton, expectant mothers should eat lots of fruit, vegetables, bread and cereals as well as moderate amounts of meat, poultry, eggs, nuts, and reduced fat dairy products. Alcohol and junk food – especially water biscuits, crisps, pastries and oven fried chips (which contain trans fatty acids) – should be avoided or water restricted. Foods such as soft cheese, pate and pre- pared salads should also be avoided as they can contain listeria.”
**7.3 GROUP EXERCISE ACTIVITY:**
**Word List Learning Task**

I am going to read a list of words to you that I want you to try to remember. You can remember them in any order you like. After I have read the whole list of words, I want you to write them down in your notebook. Don’t write them down until I have read the whole list.

(Read list at one word every 3")

Socks
Apple
Blanket
Orange
Pillow
Hat
Trousers
Pear
Doona

I am going to read the list to you again, again, after I have read the list, write down all the words you can remember.

Socks
Apple
Blanket
Orange
Pillow
Hat
Trousers
Pear
Doona

I am going to read the list one final time. Again, after I have read the list, write down all the words you can remember.

Socks
Apple
Blanket
Orange
Pillow
Hat
Trousers
Pear
Doona
Now, I want you to close your books.

Who recognised the semantic categories and tried to use that as a strategy to remember the words? Who also tried to visualise the items and make associations between them?

How many words were there?

Let’s can around the group, try to recall one word each from the list, that is different from the person before you….

Let’s start with………..
7.4 GROUP EXERCISE ACTIVITY:  
Facts Recall

“I am going to read a story to you now. I want you to listen carefully. There are three questions I will ask you at the end of the story.

Try to visualise the story while I am reading it to you, and think about the details. You don’t have to be able to remember all the details.

Try focussing on understanding what is being read to you, and associating the information with things you already know in order to help you remember it.”

(Story Adopted from the website “Ageing in the Know”)

“A moderate amount of physical activity has major health benefits and is recommended for all adults, regardless of age.

Regular physical activity has beneficial effects on most (if not all) organ systems and can prevent a broad range of health problems and diseases including reducing the risks of heart disease, high blood pressure, diabetes, obesity, osteoporosis, and colon cancer.

Regular day-to-day activities may provide enough activity for older adults. For example, these activities might include walking, gardening, or performing household chores.

Travelling to an exercise class is not necessary. Indeed, surveys show that most older adults do not prefer this option. However, for people who are trying to increase their level of activity, exercise classes can be useful because they provide supervision, instruction, and motivation.

Many professional and government organisations, have recommendations for amounts of physical activity for adults. Although these recommendations vary in some specifics, nearly all agree that adults should include a total of 30 minutes of moderate physical activity in their daily routine.”

Questions:  
What are some of the benefits of physical activity?  
What day to day activities are mentioned in the story that can offer enough activity for older adults?  
What do professional and government organisations recommend?
Read the following passage. Try to visualise the story while reading it and think about the details. You don’t have to be able to remember all the details.

Try focussing on understanding the story and associating the information with things you already know in order to help you remember it. After reading the passage try to answer the questions without having to refer back to the story.

(Story Adopted from the website “Ageing in the Know”)

“A moderate amount of physical activity has major health benefits and is recommended for all adults, regardless of age.

Regular physical activity has beneficial effects on most (if not all) organ systems and can prevent a broad range of health problems and diseases including reducing the risks of heart disease, high blood pressure, diabetes, obesity, osteoporosis, and colon cancer.

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Many professional and government organisations, have recommendations for amounts of physical activity for adults. Although these recommendations vary in some specifics, nearly all agree that adults should include a total of 30 minutes of moderate physical activity in their daily routine.”

Questions:

What are some of the benefits of physical activity?

What day to day activities are mentioned in the story that can offer enough activity for older adults?

What do professional and government organisations recommend?
7.5 GROUP EXERCISE ACTIVITY: Visual Paired Associates Recall
Study The Pairs of Pictures For 15 Seconds
WRITE THE NAMES FOR EACH OF THE PAIRS OF OBJECTS YOU
STUDIED EARLIER. SOME OF THE WORDS FROM THE PAIRS HAVE
BEEN PROVIDED TO HELP YOU.

1. Scissors & _____________
2. _________ & Glasses
3. Letter Box & _____________
4. __________ & Flag
5. Telephone & _____________
Session Eight: Language Processes: “On the Tip of My Tongue”

Outline of Group Exercise Activities

**8.1 GROUP EXERCISE ACTIVITY**
*Picture Naming Task*

**8.2 GROUP EXERCISE ACTIVITY:**
*Proverb completion*

**8.3 GROUP EXERCISE ACTIVITY:**
*Cross word completion*

**8.4 GROUP EXERCISE ACTIVITY:**
*Word generation*

**8.5 GROUP EXERCISE ACTIVITY:**
*Vocabulary definitions*

**8.6 GROUP EXERCISE ACTIVITY:**
*Paragraph reading and comprehension questions*

**8.7 GROUP EXERCISE ACTIVITY:**
*Category Fluency*

**8.8 GROUP EXERCISE ACTIVITY:**
*Picture Naming*
8.1 GROUP EXERCISE ACTIVITY
Here are some pictures of common and not so common objects that we are going to name. Some of you might experience the TOT phenomenon…you’ll know the object though have trouble accessing then name for it.
8.2 GROUP EXERCISE ACTIVITY:
Proverb completion
Activity 8.2 PROVERBS PATCH

Complete each of these proverbs by writing the missing words in the blank spaces.

1. All is fair in _______ and war.
2. ________ what you preach.
3. Absence makes the heart ________ fonder.
4. To ________ the other cheek.
5. Easier said than ________.
6. You can’t ________ a book by its ________.
7. A ________ stone gathers no moss.
8. Two ________ don’t make a right.
9. Too ________ cooks spoil the ________.
10. Every bird loves to ________ himself sing.
11. ________ is in the eye of the beholder.
12. Every ________ has a ________ lining.
13. ________ minds think alike.
14. A problem ________ is a problem halved.
15. A ________ in need is a friend indeed.
16. All roads lead to ________.
8.3 GROUP EXERCISE ACTIVITY:
Cross word completion
Activity 8.3
USE THE CLUES BELOW TO COMPLETE THE CROSSWORD. SOME OF THE LETTERS OF THE WORDS ARE INCLUDED TO HELP YOU.

Across
5. Has eight tentacles
6. Type of meat, doesn’t rhyme with steal

Down
1. Type of vegetable
2. Breakfast food
3. Used for cooking
4. An arachnid
8.4 GROUP EXERCISE ACTIVITY: 
Word generation
ACTIVITY 8.4

HOW MANY WORDS OF FOUR LETTERS OR MORE CAN YOU MAKE FROM THE LETTERS SHOWN BELOW?

Rules:
Each word must contain the centre letter (E)
Each word must contain at least four of the letters
Names of people are not permitted
Use only the letters in the grid

WRITE THE WORDS IN THE SPACES BELOW

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<tr>
<th>C</th>
<th>H</th>
<th>T</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
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<tr>
<td>E</td>
<td>E</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>K</td>
</tr>
</tbody>
</table>

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8.5 GROUP EXERCISE ACTIVITY:
Vocabulary definitions
### Activity 8.5: WORD PLAY

Circle the word that does not fit within each group. Work across the page.

1. **Thief**       Robber       Pilferer       Banker
2. **Carry**       Transmit     Recluse       Clutch
3. **Horse**       Dog          Duck          Cat
4. **Orange**      Banana       Beetroot     Pear
5. **Table**       Cabinet      Freezer      Bench
6. **Descent**     Fall         Sink         Increase
7. **Baby**        Egg          Seed         Ova
8. **Aluminium**   Iron         Steel        Glass
9. **Car**         Bicycle      Boat         Scooter
8.6 GROUP EXERCISE ACTIVITY:
Paragraph reading and comprehension questions
ACTIVITY 8.6

READ THE PARAGRAPH BELOW AND THEN ANSWER
QUESTIONS 1 - 5

The Rat Pack

Frankie, Sammy and Dino – the leaders of the pack. In the late 50s and early 60s, entertainers Frank Sinatra, Sammy Davis Jr., Dean Martin, Peter Lawford and the lesser known Joey Bishop were the epitome of bad-boy cool in America.

According to popular legend, the rakish reprobates got their nickname The Rat Pack from screen siren Lauren Bacall. “You look like a rat pack” she is said to have told them after a five-night swim through the desert Gomorrah, aka Las Vegas.

After Sinatra declared that the pack would hold a “summit of cool” at their headquarters of hedonism, the Sands Hotel and Casino, they performed and partied there on and off over seven years, making films like Ocean’s 11 (1960) and Robin and the Seven Hoods (1964) along the way.

Their exploits helped turn Las Vegas into America’s entertainment capital. They are not to be confused with The Brat Pack of young Hollywood stars in the 1980s.
1. List the names of the five members of The Rat Pack

________________________________________________________________________

2. How did The Rat Pack acquire this nickname?

________________________________________________________________________

3. Where was the “summit of cool” held?

________________________________________________________________________

4. In what year was the film Ocean’s 11 made?

________________________________________________________________________

5. Who are The Rat Pack confused with?

________________________________________________________________________
8.7 GROUP EXERCISE ACTIVITY:
Category Fluency
Activity 8.7 Category Fluency

LIST FIFTEEN DIFFERENT TYPES OF FRUITS

1. ____________
2. ____________
3. ____________
4. ____________
5. ____________
6. ____________
7. ____________
8. ____________
9. ____________
10. ____________
11. ____________
12. ____________
13. ____________
14. ____________
15. ____________
8.8 GROUP EXERCISE ACTIVITY:
Picture Naming
Activity 8.8 PICTURE NAMING

Write the Names of each of the Items Next to the Drawings.

1. Alarm Clock
2. Butterfly
3. Bananas
4. Wheelchair
5. Crab
6. Briefcase
Session Nine: Maintaining the Mind and Sharpening the Tools

Outline of Group Exercise Activities

9.1 GROUP EXERCISE ACTIVITY:
Word Pairs List Learning Task

9.2 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs List Learning Task

9.3 GROUP EXERCISE ACTIVITY:
Story Recall

9.4 GROUP EXERCISE ACTIVITY:
Word List Recall
9.1 GROUP EXERCISE ACTIVITY:
Word Pairs List Learning Task

We are going to learn a new set of word pairs. I want you to apply the same principals and strategies that we have learnt over the past few weeks.

I am going to read each of the pairs to you and want you to remember what goes with what. After I’ve gone through the list, I will read out the first word of each pair and ask you to write down what you thought went with it. I will then read the word pairs again and we’ll do the same thing once more. I don’t want you to write anything down until I ask you to. All you need to do to begin with is to listen to the pairs as I read them and try to remember what words are paired together. Does everyone understand? (If yes, continue, if not, review instructions again).

Here we go…Listen carefully and try to remember the pairs

(Present one pair every four seconds.)

<table>
<thead>
<tr>
<th>Lavender</th>
<th>Blind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td>Rose</td>
</tr>
<tr>
<td>Tiger</td>
<td>Door</td>
</tr>
<tr>
<td>Truck</td>
<td>Sand</td>
</tr>
<tr>
<td>Kettle</td>
<td>Black</td>
</tr>
<tr>
<td>Bag</td>
<td>Desk</td>
</tr>
<tr>
<td>Chip</td>
<td>Knife</td>
</tr>
</tbody>
</table>

I want you to write down, what word went with

<table>
<thead>
<tr>
<th>Lavender</th>
<th>(Blind) ten seconds to respond… “Lavender went with Blind”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil</td>
<td>(Rose) ten seconds to respond… “Pencil went with Rose”</td>
</tr>
<tr>
<td>Tiger</td>
<td>(Door) ten seconds to respond… “Tiger went with Door”</td>
</tr>
<tr>
<td>Truck</td>
<td>(Sand) ten seconds to respond… “Truck went with Sand”</td>
</tr>
<tr>
<td>Kettle</td>
<td>(Black) ten seconds to respond… “Kettle went with Black”</td>
</tr>
<tr>
<td>Bag</td>
<td>(Desk) ten seconds to respond… “Bag went with Desk”</td>
</tr>
<tr>
<td>Chip</td>
<td>(Knife) ten seconds to respond… “Chip went with Knife”</td>
</tr>
</tbody>
</table>
I am going to read each of the pairs to you again. I want you to again try to remember the words that go together.

Here we go...(Present one pair every four seconds.)

Lavender  Blind
Pencil    Rose
Tiger     Door
Truck     Sand
Kettle    Black
Bag       Desk
Chip      Knife

I want you to write down your answers... what word went with...

Lavender  (Blind) ten seconds to respond... “Lavender went with Blind”
Pencil    (Rose) ten seconds to respond... “Pencil went with Rose”
Tiger     (Door) ten seconds to respond... “Tiger went with Door”
Truck     (Sand) ten seconds to respond... “Truck went with Sand”
Kettle    (Black) ten seconds to respond... “Kettle went with Black”
Bag       (Desk) ten seconds to respond... “Bag went with Desk”
Chip      (Knife) ten seconds to respond... “Chip went with Knife”

How did everyone do... do we need to run through them one more time? Let’s go over them once more. I want you to remember the pairs because I’m going to ask you about them again a little bit later on. Here we go, I’m going to read them to you one more time, you can check the words off with what you have previously written, as I go down the list.

(Present one pair every four seconds.)

Lavender  Blind
Pencil    Rose
Tiger     Door
Truck     Sand
Kettle    Black
Bag       Desk
Chip      Knife
9.1 GROUP EXERCISE ACTIVITY: Word Pairs List Learning Task

Record your answers only when instructed to:

Lavender
Pencil
Tiger
Truck
Kettle
Bag
Chip
9.2 GROUP EXERCISE ACTIVITY:
Recall of Word Pairs List Learning Task

I’m going to say the first word of each pair that we learnt and I want you to write down what you think the answer is…here we go…

Lavender went with (Blind)
Pencil went with (Rose)
Tiger went with (Door)
Truck went with (Sand)
Kettle went with (Black)
Bag went with (Desk)
Chip went with (Knife)

Ok let’s review the answers….how did everyone go?
**9.2 GROUP EXERCISE ACTIVITY: Word Pairs List Learning Task**

Record your answers:

<table>
<thead>
<tr>
<th>Item</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavender</td>
<td></td>
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<td>Pencil</td>
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<td>Tiger</td>
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<td>Kettle</td>
<td></td>
</tr>
<tr>
<td>Bag</td>
<td></td>
</tr>
<tr>
<td>Chip</td>
<td></td>
</tr>
</tbody>
</table>
9.3 GROUP EXERCISE ACTIVITY:
Story Recall

I want you to study this story. You will have five minutes to try to remember as much about it as you can. I will then present you with some questions that I’d like you to remember.

Here is your story.
ACTIVITY 9.3: Story Recall

You Have Five Minutes to Study the Following Passage and Remember as Many Details as You Can.

Below is an excerpt on the nutritional value of bread. This is written by Joanna McMillan Price and was featured in the Magazine “Life etc”.

“Bread has been central to human life so long it’s hard to believe there can be so much controversy surrounding its nutritional worth. Bread is mentioned in the Bible numerous times and there’s solid archaeological evidence that humans have eaten bread for more than 7000 years.

In almost every community around the world you find a version of flour (from grain or a starchy vegetable) mixed with water or milk to form a dough, sometimes raised with yeast or baking powder, and then baked. In France, it’s the baguette, in Mexico the tortilla, in India chapati and the Middle East pita, in Eastern Europe sourdough and in Ireland it’s soda bread.

The recent decline in bread’s popularity has been caused partly by those who advocate a high-protein, low carbohydrate diet. Not to buy into that debate, let’s just say that were it bread per se that made us fat, obesity would not be the problem it is today...”
ACTIVITY 9.3: Story Recall – Questions

The following questions relate to the information you just studied.

1. What is the historical artefact that mentions the use of bread?

2. For how many years does the evidence suggest bread has been eaten for?

3. In France they have the baguette and in Mexico the tortilla…What do they have in Eastern Europe?

4. What does the writer consider the decline in the popularity of bread to be partly due to?
9.4 GROUP EXERCISE ACTIVITY
Meaningful organisation: Word List Learning Task

I am going to present a list of words to you that I want you to try to remember. You can write the words down. I want you to think about meaningful organisation and how this assists memory. You will have five minutes to study the words and then I am going to test you on them.

Here are the words

Scarf
Rabbit
Shoes
Mushroom
Giraffe
Cucumber
Jumper
Tortoise
Turnip

Now that you have had five minutes to learn them, I am going to present you with a piece of paper and I want you to record what the words were, from your memory.

In order to have helped you learn the words, you would have performed best if you had have organised the words in a meaningful way. One way to have done this may have been:

Rabbit
Tortoise
Giraffe
(Animals)

Jumper
Shoes
Scarf
(Clothing)

Turnip
Cucumber
Mushroom
(Vegetables)

How did everyone go? Were you able to remember the words?
Session Ten: Final Review and Take Home Messages

Outline of Group Exercise Activities

10.1 GROUP EXERCISE ACTIVITY: Processing Speed/Attentional Task

10.2 GROUP EXERCISE ACTIVITY: Processing Speed/Attentional Task

10.3 GROUP EXERCISE ACTIVITY: Processing Speed/Attentional Task

10.4 GROUP EXERCISE ACTIVITY: Memory Task

10.5 GROUP EXERCISE ACTIVITY: Memory Task

10.6 GROUP EXERCISE ACTIVITY: Word Challenge

10.7 GROUP EXERCISE ACTIVITY: Crossword Challenge

10.8 GROUP EXERCISE ACTIVITY: Verbal Fluency
10.1 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task
PUT A LINE THROUGH ALL OF THE “7”s THAT ARE IMMEDIATELY FOLLOWED BY A “6”. THE FIRST ONE IS DONE FOR YOU.

<table>
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10.2 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task
Activity 10.2

COMPLETE THE MAZE WITHOUT MISTAKES
10.3 GROUP EXERCISE ACTIVITY:
Processing Speed/Attentional Task
Activity 10.3

CIRCLE EVERY FOUR THAT YOU SEE. WORK AS QUICKLY AS YOU CAN.

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10.4 GROUP EXERCISE ACTIVITY:  
Word List Learning Memory Task

I am going to read a list of words to you that I want you to try to remember. You can remember them in any order you like. After I have read the words to you, I want you to write them down in your notebook.

Bowl  
Rug  
Couch  
Owl  
Knife  
Crocodile  
Cat  
Mug  
Lamp

I am going to read the list to you again, again, after I have read the list, write down all the words you can remember.

Bowl  
Rug  
Couch  
Owl  
Knife  
Crocodile  
Cat  
Mug  
Lamp

I am going to read the list one final time. Again, after I have read the list, write down all the words you can remember.

Bowl  
Rug  
Couch  
Owl  
Knife  
Crocodile  
Cat  
Mug  
Lamp

Okay. Who recognised the semantic categories and tried to use that as a strategy to remember the words? Who also tried to visualise the items and make associations between them? How many words were there? Who can tell me what the words were?
Activity 10.5

Spend Sixty Seconds Memorising These Items
List The Items That You Previously Memorised

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10.4 GROUP EXERCISE ACTIVITY:
Memory Task
10.5 GROUP EXERCISE ACTIVITY:
Memory Task
10.6 GROUP EXERCISE ACTIVITY:
Word Challenge
Activity 10.6

Match the Animals To Their Homes By Drawing A Line To Connect Them

- Ant      Web
- Bat     Lair
- Bear     Coop
- Bee     Nest
- Chicken     Hill
- Fox     Den
- Horse     Hive
- Pig      Cave
- Spider     Stable
- Wasp     Sty
10.7 GROUP EXERCISE ACTIVITY:
Crossword Challenge
Activity 10.7

USE THE CLUES BELOW TO COMPLETE THE CROSSWORD

ACROSS
2. Alcohol
4. Fruit

DOWN
1. Instrument
3. Colour
10.8 GROUP EXERCISE ACTIVITY:
Verbal Fluency
Activity 10.8

LIST FIFTEEN DIFFERENT TYPES OF SPORTING ACTIVITIES

1. ____________
2. ____________
3. ____________
4. ____________
5. ____________
6. ____________
7. ____________
8. ____________
9. ____________
10. ____________
11. ____________
12. ____________
13. ____________
14. ____________
15. ____________
Promoting Healthy Ageing with Cognitive Exercise

The PACE Study: A Randomised Control Trial of Cognitive Activity for Older Adults with Mild Cognitive Impairment

Education Intervention

PROGRAM MANUAL
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SESSION ONE:
INTRODUCTION
SESSION ONE: Introduction

**Objectives:**

- Introduce Study
- Explain content of Manuals
- Review Program Outlines
- Introduce group members to each other
  - Name Tags
  - Ice Breaker Exercise
  - Interview exercise
- Tea Break
- Presentation of ageing– biological and physiological changes
- Introduce next session topic
1. Welcome

- Welcome everybody and thank you for volunteering your time to participate in our new, exciting and innovative research study.

- As you know, this study is a joint collaboration between Royal Perth Hospital, the University of Western Australia and the Centre of Excellence for Alzheimer’s Disease Research and Care.

- My name is Mandy and I’m going to be running each of the sessions over the next ten weeks with you. I am a Clinical Neuropsychologist and work for Royal Perth Hospital.

- By now you would have all completed the first phase of the study, which was the baseline assessment of your memory and other aspects of your cognition and abilities.

- We are going to begin the second phase of the study today.

- For the next ten weeks, you will be invited to attend every (insert day) at (insert time) to participate in approximate 90-minute sessions covering a variety of educational topics.

- I am going to provide each of you with a Manual, which is yours to keep. At the beginning of each session, I will provide you with handouts on the material we are going to cover. You are welcome to write in the manuals and on the handouts, as you will not need to give them back at the end of the study.

- You will recall that the purpose of this study is to determine whether cognitive activity can improve memory. You have all been randomly selected to participate in the education component of this study. There is no conclusive evidence regarding the benefits associated with mental activity and it remains unclear as to the value of educating older adults regarding issues related to healthy ageing and retirement.

- If you all open to the front section of your manual, you will find a space to insert your name and contact details should you misplace or lose your folder.

- The next couple of pages provide details regarding the study and contact information if for any reason, you want to contact the research team. For example, if you are sick or unable to attend one of your sessions.

- You will also find a space for you to fill in the day and time that you are attending your sessions each week. Further, there is a calendar that you can use to mark each of the days you attend.
In order to make this research project a positive experience it is important that we try to respect each other. In this regard some rules might be helpful. These are set out in the “Participation Pledge”.

Additionally, any personal information that is discussed during the sessions is to remain confidential. Whilst you are free to discuss the material presented in the sessions, if I invite you to talk about personally relevant experiences, I would ask you all to keep that information confined to the session.

If at any time you feel that you need a break, for example to go to the bathroom; please feel free to leave the room and use the designated toilets at the other end of the hall.

If at any stage you feel distressed or uncomfortable for any reason, please let me know.

I am also happy to repeat any information or answer any questions as we go along. Interrupt me if there is something that you mishear or have difficulty understanding.

Tea breaks will be scheduled in the middle of each session and you will be provided with tea, coffee and biscuits.
2. Program Outline

- Let’s review the topics of information we are going to cover over the next nine weeks. The titles of these are outlined in your manual.

SEE NEW SLIDE

- Next week we are going to discuss memory changes that become apparent as we get older and how age related memory changes are different from dementia. We will also briefly take a look at the most common cause of dementia, Alzheimer’s disease, in that session.

NEXT

- The third session will be devoted to looking at the benefits of physical activity and ways in which you can incorporate fitness into your daily schedule. We will also spend some time talking about nutrition.

NEXT

- A discussion about the causes, effects and management of stress and depression make up sessions four and five.

NEXT

- In session six we will review sleep changes in older adults and ways of managing sleep problems.

NEXT

- Challenging the negative stereotypes associated with ageing and factors related to retirement will be addressed in sessions seven and eight.

NEXT

- Session nine will look at ways to keep yourself safe in and out of the home as well as issues related to planning for the future.

NEXT

- The final session will be spent reviewing some of the issues that have been explored.

- For the success of this research project it is very important that you try to attend each of the program sessions. Even if you feel that some of the sessions may be covering issues you are already very familiar with; by coming along you can share your experiences and knowledge with other members of the group.

- Does anyone have any questions so far?
3. Group Familiarity

SEE NEW SLIDE

· Given that we are going to be spending time together over the next nine weeks, let’s start to get to know each other a little better.

· I’m going to ask each of you to create your own nametag.

· Please wear your badge during each of the sessions.

· Now, let’s go around the group. I’d like each person to introduce himself or herself by saying their first name; their reasons for volunteering in the study and any expectations they have regarding the study. I’ll go first.

· My name is Mandy, I am trained as a Neuropsychologist and I am undertaking this research as part of my University degree. I hope that you will all find the information I present in each of the sessions interesting and thought provoking and I look forward to interesting discussions in the group.

· Perhaps, (insert group member name), you could go next and we’ll continue moving around to the left, with (insert group member name) following after you and so on.

· Excellent, thanks everyone. Now let’s pair up and interview each other. I have a handout I would like you to complete. You will have five minutes to interview each other and then we will introduce each other to the rest of the group.

· (PROVIDE EACH PERSON WITH A HANDOUT, ALLOW TEN MINUTES TO COMPLETE EXERCISE. THEN SPEND TEN MINUTES GOING AROUND THE GROUP TO DISCUSS RESPONSES)

· Let’s have a tea break.

SEE NEW SLIDE

4. Tea Break
5. Brief documentary about ageing biological and physiological changes

SEE NEW SLIDE

- In the second part of this session we are going to watch a documentary on the biological and physiological changes associated with normal ageing and then have a discussion regarding some of the issues this film raises.

(Age Happens Video starts at 1’55”; finish at 18”)

6. Open Discussion regarding the presentation

- Present set of questions to encourage discussion.

7. Closing

SEE NEW SLIDE

- Let’s leave it there for today.
- Thank you all for participating.
- Next week we are going to start our program more formally. We will talk about how aspects of our thinking change as we get older, in particular memory and the differences between normal ageing and dementia.
- See you all next week.
SESSION TWO:
MEMORY AND DEMENTIA
SESSION TWO: Memory and Dementia

Objectives:

- Introduce Session

- Discussion on the ageing brain:
  - What changes are expected in older adults (attention, processing speed, memory)
  - What are the effects on cognition (difficulty multi-tasking, trouble sustaining attention, memory difficulties)

- Review of normal memory problems and memory impairment associated with dementia
  - Differentiating between memory problems and dementia
    - Losing items
    - Persistent and progressive decline
    - Interference with daily activities

- Defining Dementia
  - Terminology
  - Age as a risk factor
  - Discussion in group of known person’s with dementia
  - Early signs and symptoms

- Tea Break

- Video presentation on Alzheimer’s disease “Memory Matters”

- Defining Alzheimer’s disease
  - Risk Factors
  - Diagnosis

- Introduce next session topic
1. Introduction

- Welcome back everyone.

- Today we are going to take a closer look at the notion of memory, how this changes with ageing and how we differentiate between minor memory lapses and more serious memory problems, which are typical for the onset of dementia.

- Here is a copy of the material being covered in today’s session.

- If you take a moment to stop and think about how much we rely on our memory to do everyday things, it becomes clear just how valuable an asset a reliable memory is.

- Without your memory, everyday activities that we can sometimes take for granted, such as remembering how to prepare breakfast, would be extremely difficult to perform.

- Additionally, think of all the faces of family members and friends you remember and all the words you know the meanings of.

- Some aspects of memory tend to decline with increasing age and this may have an impact on the way we function.

- Whilst memory for past events, such as holidays we went on years ago, or our memory for the meanings of words remains relatively stable, we may begin to find it harder to remember information of a more short term nature, such as the name of the midday movie we watched yesterday.
2. The ageing brain

- It is widely accepted that ageing causes changes to the structural and functional make-up of the brain.

- Whilst some areas of the brain are affected more than others, for some people, the brain becomes less efficient in processing information.

- When compared to younger persons, older adults tend to have greater difficulty trying to selectively attend to information; having trouble trying to ignore irrelevant information.

- Multi-tasking, or trying to do two or more things at once becomes more difficult for some people. For example trying to have a conversation with someone whilst the television is on or trying to listen to a radio program and bake a cake.

- *Can any of you provide examples where you have noticed that trying to do two things at a time has become more difficult?*

- The brain of an older adult is also not as good at sustaining concentration. For example you may have noticed that you are not able to devote as long periods as previously to sustaining your attention when reading a novel. You may find it harder to remain focussed during a long telephone conversation.

- Another consequence of ageing is that cognitive slowing occurs. Essentially this means that there is a tendency for the speed of mental operations to slow down as we age. It may take longer to learn a new piece of information or to react in a situation.

- These difficulties in attention and concentration, and the slowing of thought processes are considered to be contributing factors as to why older adults often experience every day problems with their memory.

3. What’s normal and what’s not?

- So, when is forgetfulness more than just a consequence of mere ageing?

- Everyone forgets things from time to time. We have all experienced the situation of walking into a room and forgetting why we were going in there in the first place. You may have also misplaced keys or lost reading glasses. All adults, of all ages, experience these sorts of situations.

- These situations contrast however with the types of memory problems experienced by people with dementia. For the individual with dementia, the memory problems are persistent and progressive, not just occasional.

- Another important difference is that memory change associated with healthy ageing doesn't interfere with everyday life in any dramatic way. However the memory difficulties experienced by someone with dementia significantly influence their ability to carry out aspects of their daily functioning. That is, their memory problems are severe enough to influence tasks like grocery shopping or the ability to drive.

- Before we go any further, let’s be clear about what the word ‘dementia’ means.
4. **Defining dementia**

- The term ‘dementia’ is derived from the Latin ‘de mens’, meaning, ‘without mind’ (Lars Gustafson) and is used to describe the symptoms of a large group of illnesses which cause a gradual decline in mental functioning (eg. memory, planning and problem solving) and social skills.

NEXT

- It is generally a progressive condition whereby the individual may start off experiencing mild difficulties or noticing subtle changes, to the point where they may no longer be able to look after themselves independently and demonstrate behaviours uncharacteristic of their former selves.

NEXT

- There are a variety of causes of dementia. The most common cause of dementia in Australia is Alzheimer’s disease.

- Other types of dementia that you may have heard about before include Vascular dementia, which is a dementia associated with problems of circulation of blood to the brain and Fronto-temporal dementia when there is degeneration primarily affecting one or both of the frontal or temporal lobes of the brain.

NEXT

- Dementia is not a normal part of ageing. Whilst dementia can happen to anybody, it is more common after the age of 65 years. One in four people aged over 85 years have some form of dementia. In this sense, age is the main risk factor for dementia.

NEXT

- You may recall some famous people who have suffered dementia. Ronald Reagan, Winston Churchill, Charles Bronson, Rita Hayworth and Hazel Hawke.

- *Do any of you know a person or have a relative with dementia? Opportunity for discussion.*

SEE NEW SLIDE
· Early signs and symptoms of dementia might include
  NEXT
· Difficulty recalling recent events
  NEXT
· Having trouble making decisions or demonstrating poor judgment
  NEXT
· Difficulty managing routine chores or having trouble handling complex tasks like balancing a cheque book
  NEXT
· Difficulty understanding or following a story or conversation
  NEXT
· Behaviour and personality changes

Let’s take a tea break and then look at dementia, in particularly, the most common form of dementia in Australia, Alzheimer’s disease, in a little more detail.

SEE NEW SLIDE

5. Tea Break

SEE NEW SLIDE

6. Video Presentation: “Memory Matters” (20 minutes long)

· Does any one have any questions about the video or would like to make any comments?

SEE NEW SLIDE
7. Alzheimer’s Disease – The Fast Facts

- Let’s review some of the facts about Alzheimer’s disease.
- Alzheimer’s disease accounts for roughly 2/3 of dementia cases in Australia

- It is characterised by abnormal pathology in the brain
  - Loss of brain cells
  - Brain shrinkage
  - A build up of abnormal microscopic structures called “plaques” and “tangles” which are clumps and strands of proteins that accumulate outside and inside brain cells.
  - Poor communication of the brain cells to each other

- The risk of developing AD increases if there is a 1st degree relative with the disease.

- As indicated age is also a risk factor, particularly being aged 80 and older.

- In order to be diagnosed with AD an individual needs to:
  - Demonstrate impairment in memory abilities as well as in another aspect of thinking such as language or in planning and organisation.
  - There needs to be evidence of decline.
  - The difficulties need to be severe enough to cause difficulty in the ability to undertake aspects of daily functioning such as managing aspects of the household or driving.
  - There must be no evidence of a clouding of consciousness or acute confusion at the time of the diagnosis.
  - Other reversible causes of cognitive difficulties also need to be ruled out such as depression, medical problems.

- Naturally, when people are diagnosed with early AD they may be worried and their family members will also be concerned.

- A helpful approach in these instances is to try to find out as much as possible about the disease and the supports that are available.

- It is also important that the person with AD tries to make plans for the future, such as making a living will and putting their finances in order.

- The value and benefit of dementia medications is limited. Whilst we are not going to discuss these issues here in detail, it is important to recognise that at present, these medications can be helpful, but are not curative. The medication treatments offer some relief from the symptoms
of Alzheimer’s disease for some people for a limited period of time. However, they can not
cure the disease.

· We have a few minutes left open for discussion if there are any questions or
comments people would like to make.

· Here is a handout which is produced by the Alzheimer’s association, and it outlines some of
the facts about Alzheimer’s disease. You will find lots more of these on their web-site and the
documents are also available directly from the organisation.

8. Closing

SEE NEW SLIDE

· Let’s leave it there for today.

· Next week we are going to talk about physical activity and health issues.
SESSION THREE:

PHYSICAL ACTIVITY
AND
NUTRITION
SESSION THREE: Physical Activity and Nutrition

(Taken from the Physical Activity HandBook; Einstein and McDaniel, Australian Government Guide: Choose Health: Be Active; Nutrition Australia)

Objectives:

- Introduce Session
  - Traditional views on ageing and physical activity
  - Current views on ageing and physical activity

- Beginning and exercise regime
  - Attitudes to physical activity
  - Achieving the optimal benefits from exercise
  - Video presentation

- Review benefits of physical activity
  - Prevention of illness and disability
  - Improved quality of life

- Devise and review potential list of activities people could engage in
  - Review common excuses for not exercising
  - Goal setting

- Tea Break

- Discussion of pamphlets on Physical Activity

- Discussion of pamphlet on Falls

- Introduction to Nutrition

- Video Presentation

- Discussion on where older adults can seek more information regarding healthy eating habits

- Introduce next session topic
1. Introduction

Today’s session is going to focus on physical activity, what the experts are recommending and the sorts of activities you can become involved in within the community. We will also spend some time discussing nutrition for older adults.

Here is a copy of the material being covered in today’s session.

Firstly we will begin our discussion on physical activity.

Traditionally, the view of ageing and physical activity was that older adults should conserve energy and avoid potentially vigorous activity.

Ancient philosophers believed that human longevity was determined by how quickly we used up our vital spirits. Accordingly, a long and healthy life was considered to result from inactivity and conserving one’s resources.

In more recent years, this conservative way of thinking has been reversed and we now understand the many virtues associated with being physically active.

When we think about physical activity, we tend to think of more aerobic related exercises e.g. such as running or vigorous walking, that require exertion.

You might be surprised to learn some of the other ways you can increase your level of physical activity, without even needing to don a pair of sneakers.

Firstly, let’s look at how physical activity can improve health.
2. Taking the First Steps

- It is important to recognise your attitudes and perceptions toward physical activity.

SEE NEW SLIDE

- If you think of exercising as a bit of a chore and something you don’t really have time for or need, you might find it encouraging to learn that incorporating thirty minutes of physical activity into your daily routine, may be a lot easier than you think.

- Being active in lots of different ways throughout the day can provide opportunity for improved health and well being.

- You should try to be active each day in as many ways as you can, by utilising every opportunity that crops up. This might mean getting off at the bus stop before your usual one and enjoying an extra stroll.

- Being active in small ways too, such as doing some light gardening or washing your car, instead of taking it through a car wash are also positive ways to increase opportunities for activity into your daily schedule.

SEE NEW SLIDE

- According to the Australian Government Physical Activity Guidelines, everyone should try to do at least 30 minutes of moderate intensity physical activity on most days of the week.

- This doesn’t need to be thirty minutes of continual exercise and could mean a brisk 10minute walk in the morning and a ten minute cycle down to the café’ for lunch and swimming in the afternoon.

SEE NEW SLIDE

- Think about the current amount of physical activity you are engaging in...would you meet the guidelines of approximately 150 minutes of moderate intensity physical activity each week? Opportunity for group discussion

SEE NEW SLIDE

- Let’s take a look at this video before we have some morning tea.

3. Video Presentation “Maximising Physical Activity” ~13minutes

SEE NEW SLIDE
4. **Get Moving!**

   - As you can see from points raised in the video, it’s never too late to become physically active.

   - Not only can physical activity help prevent illness and disability; it can also influence your ability to remain independent within the community.

   - If you are inactive, you may be more prone to declines in bone and muscle strength, have reduced heart and lung fitness and less flexibility.

   - By being active, you can reduce the risk of

     - Heart disease and high blood pressure

     - Falls and injuries

     - Obesity

     - Type II (late onset) diabetes

     - Osteoporosis

     - Stroke

     - Depression
Session Three: Physical Activity and Nutrition

- Other benefits include:
  - Increased opportunity to meet new people and be socially active
  - Improved quality of life including having more energy and improving mental health, self esteem and confidence
  - Reducing physical pain due to improved posture, balance, muscle and bone strength
  - Relaxation, stress reduction and improved sleep.
5. Getting Started – Activities that Suit

SEE NEW SLIDE

- You should always consult your doctor if you have any concerns regarding your ability to engage in exercise.

- You might feel too tired to start, however you’ll soon notice that physical activity will help you feel better and give you more energy.

NEXT

- Don’t let excuses such as “I’m too old”, “I’m afraid I will wear out”, “I can’t afford it” or “there’s nothing to do where I live” be barriers to starting your own routine.

- What are some other common barriers that people have come across when trying to increase their level of physical activity? Opportunity for group discussion.

NEXT

- Set yourself some goals, start slowly and increase the amount of activity you do gradually.

NEXT

- It’s best to start with activities you know you will enjoy and then try something new once you feel ready for a little more of a challenge.

NEXT

- Remember, try to incorporate activities into your daily routine and if you find it hard to get motivated, try joining a club, or even ask your neighbour to join you in a regular morning walk.

NEXT

- Try to be active every day if you can, particularly if wanting to lose weight is an issue for you.

SEE NEW SLIDE

6. Tea Break

- Let’s have a quick tea break and then we will finish the session discussing the issue of nutrition.

SEE NEW SLIDE
7. Review of Pamphlets
   - I have three handouts to give you today. The first “It’s Never to Late to be Active” covers a lot of the information we have discussed in the session today as well as providing you with more examples on how to get started.
   - The second handout produced by the Australian Government, provides additional information on the national physical activity for guidelines.
   - The third handout is a home safety checklist which reviews the issue of falls in the home. Falls have enormous social, health and economic costs for both older adults and the whole community. One in four people 60 years and over will fall each year.
   - This handout takes you through the steps you take to remain mobile and independent and to prevent falls before they happen. In it you will find suggestions for safety tips for each room in your house, as well as outside, as well as a checklist for what to do if you should have a fall at home.
   - Any questions? Let’s move on to talk briefly about nutrition and the older adult.

8. Nutrition
   - Australians are living longer and in order to maintain health into these extra years, good nutrition is very important.
   - Neglecting proper nutrition is one of the most common health problems in older adults. Eating too many high-fat foods and not exercising is a combination that can lead to diabetes and heart disease.
   - Malnutrition increases the risk for contracting a number of medical conditions making it important not to neglect your diet.

8. Video Presentation
   - Are there any questions?
10. Obtaining More Information

- The brochure referred to in the video “Eat Well for Life” is a Commonwealth Government Publication that is currently being updated and will be available in the New Year.

- Nutrition Australia is a non-profit, non-government national community nutrition education organisation. They produce a number of publications available for older adults. They also run cooking and nutrition classes teaching about cooking for one. You can contact Stephanie McFaul on 6304 5714.

- You can also ask your general practitioner for a referral to a dietician in your local area.

11. Closing

- Thank you all for attending today. Next week we are going to look at stress and the effects of stress on our level of functioning.

- See you all next week.
SESSION FOUR:

STRESS

Causes, Effects and Management
SESSION FOUR: Stress – Causes, Effects and Management

(References: The AGS Foundation for Health in Aging-Aging in the Know; Better Health Channel)

Objectives:

- Introduce Session
- Stress
  - Causes of stress (financial concerns, family problems, health & disability, housing issues, loss & grief, retirement and boredom)
  - Group discussion of personal experiences
- Review of negative effects of stress
  - Sleep difficulties
  - Physical changes
  - Mood issues
  - Cognitive problems
- Managing stress – strategies and techniques
  - A positive belief
  - Feelings of self confidence and personal control
  - Techniques
    - Coping strategies
    - Regular exercise
    - Reduce/stop smoking; moderate alcohol consumption; healthy diet
    - Hobbies; Social life; Volunteering
    - Learn Tai Chi or Yoga
    - Massages, hot baths or spas
    - Meditation and deep breathing
    - Listening to music or other relaxation tapes
    - Self-hypnosis
    - Counselling, therapy or support groups
- Tea Break
- Anxiety – Definitions, symptoms and treatment
- Demonstration of relaxation exercise
- Summary and introduction of next session’s topic
Session Four: Stress – Causes, Effects and Management

1. Introduction
   - Last week, in addition to talking about nutrition, we reviewed the benefits of physical activity.
   - One of the benefits was improving well being and reducing stress.
   - Today we are going to look in more detail at the issue of stress, the potential causes, the effects on your health and ways to manage stress.
   - Here is a copy of the material being covered in today’s session.

SEE NEW SLIDE

The word “Stress” can have a number of meanings. In this instance we will be exploring the definition of stress as “a mentally or emotionally disruptive or upsetting condition, which occurs in response to adverse external influences and is capable of affecting physical health”. Stress is difficulty that causes worry or emotional tension.

2. Stress and Retirement
   - Whilst some people find that retirement can lead to a reduction in stress that was associated with working and employment responsibilities…there may also be circumstances surrounding retirement that can be stressful.
   - When most people think about retirement, they consider it a time of opportunity for holidays, recreational activities, relaxing and taking things easy.
   - It is not uncommon however, in the context of everyday life challenges, for older adults to experience stress at some point in time.
   - Stress can be physical or social and caused by a sudden situation or be ongoing and part of your day to day life.

SEE NEW SLIDE

Stress can be the product of any number of concerns including:

- **Financial problems and social status** - A person might suddenly realise that the size of their superannuation is not enough to sustain the lifestyle they are accustomed to. They might have to use savings for an unexpected event and not have money for the things they planned.

NEXT

- **Family problems (eg. being the primary carer for a loved one)** - family members, especially spouses are often placed in a role as caregiver. Whilst on one hand this can be a rewarding experience, it is also very stressful. Caregivers are at a much higher risk for developing mental and physical health problems including depression, substance abuse and sleep disturbance. Caregivers may also experience social isolation, become involved in family disagreements or suffer financial hardships.

NEXT

- **Health and disability problems (eg. arthritis, chronic pain)** – Chronic pain and a decline in physical functioning can all contribute to stress. A lack of sleep or reduced quality of sleep also impacts on our ability to cope with stress.
Session Four: Stress – Causes, Effects and Management

- Housing problems – Coping with the demands involved in managing a large household or deciding/need to make new accommodation choices can be a source of stress.

- Loss and grief (eg. death of a spouse) - Unfortunately, as we get older, we are more likely to experience grief associated with the death of friends and family members. One of the most traumatic situations commonly faced is the death of a spouse. Loss and grief reactions may also be a product of sight or hearing impairments or reduced physical functioning.

- Retirement and boredom – Sometimes, older adults find that whilst initially they had lots of exciting plans for things to do once they retired, they became bored with their new routine and lack of daily purpose.

Discussion of personal experiences related to these issues.

- Some of you may have experienced stress related to some of these issues. Would anyone like to share their experience and how it impacted on them?

3. Is stress really that big of a deal?

- Long-term stress can have negative effects on a number of different aspects of your health, which you may not realise. The effects can be physical and mental.

- Stress can cause:

  - Sleeping difficulties – an individual might start to have trouble falling off to sleep; find they are laying awake ruminating about things; or wake during the night and have trouble resuming sleep
  - Muscle tension, which can lead to feeling sore and aches and pains
  - Changes in blood pressure and can contribute to heart disease
  - Mood changes (eg. irritability, anxiety, nervousness, emotionality)
  - Changes in thinking abilities – poor concentration, difficulty with memory, trouble finding words in conversation, reduced ability to plan and organise.
4. What can I do to manage stress?

SEE NEW SLIDE

- There are many different ways to try to manage stress and what works best will depend on the individual.

- A positive belief in your ability to cope and manage with stress will go a long way in your ability to handle the situation and to reduce the potentially negative impact that stress can have.

- Feelings of self-confidence and personal control can make a significant difference in lessening the negative effects of stress, maintaining quality of life and in your ability to make sensible decisions.
Some techniques for dealing with stress include:

- **Adopt sensible coping strategies** – reduce the amount of activities you are trying to do and focus more on those that give you pleasure.

- **Regular exercise**, as approved by your HealthCare provider - this doesn’t necessarily mean you have to be engaging in high level intense activities. Simply going for a walk, taking a swim, or getting out in the garden may be a way for you to clear your thoughts and take your mind off of what might be bothering you.

- **Reduce/stop smoking; moderate your alcohol consumption and eat a healthy diet.**

- **Hobbies; A good social life** – engage in social activities and seek support from family and close friends; Volunteering.

- **Learn Tai Chi or Yoga** – these sorts of activities can have many benefits. Not only can they help to relieve stress and improve energy levels, they can also assist with balance and flexibility, increasing strength and improving focus/concentration.

- **Massages, hot baths or spas** – can help to relax your body and reduce muscle tension.

- Other types of relaxation techniques include
  - Meditation and deep breathing
  - Listening to music or other relaxation tapes
  - Self-hypnosis
  - Counselling, therapy or support groups
5. Tea Break

- Let’s have a short break. When we come back, we will devote some time to discussing anxiety, before we try a relaxation exercise.

SEE NEW SLIDE

6. Anxiety

- Worry can be a normal reaction to a situation, such as illness or financial problems, and we all might feel anxious at times in certain situations eg. before an operation.

- Anxiety disorders, are disorders that involve unrealistic or excessive worry about multiple areas of life.

- These sorts of disorders can become more common as we age, as there can be a tendency for medical, psychological and social problems to build up.

- Individuals who suffer persistent or extreme anxiety have a reduced quality of life.

SEE NEW SLIDE

Symptoms include:

- Tense muscles, leading to shaking, trembling and restlessness

- Shortness of breath, rapid heart rate, sweating, dry mouth, dizziness, nausea, diarrhea, flushes or chills, frequent urination

- Being overly watchful or alert, easily startled, trouble concentrating, irritability and sleep disturbance

- Changes in behaviour or normal routines that are used to reduce anxiety, such as avoiding specific situations, withdrawing, or generally decreasing activities outside the home; Repetitive checking behaviours.

- Anxiety can be associated with depression, dementia, side effects to drug treatment, or associated with medical disorders such as heat disease, lung disease, thyroid and other endocrine problems, neurological conditions or dietary problems.

- Diagnosis usually involves attendance to your general practitioner and possibly referral for tests and review by other specialists such as a Psychologist or Psychiatrist.

- A combination of psychological therapy and medication may be necessary to effectively treat the anxiety disorder.

SEE NEW SLIDE
8. **Relaxation Exercise**

- One of the techniques used to manage Stress and Anxiety Disorders are relaxation exercises. We are going to look at these in more detail now.

- Firstly, let me demonstrate how stress can cause muscle tension and how muscle tension can lead to pain and fatigue.

- I would like you all to pick up a piece of paper and hold it out in front of you with your arm outstretched.

- We are going to hold this position for two minutes, without moving our arm.

- You probably noticed that your arm felt tired after only a very brief amount of time and that it may have even started to ache in some places. Although the paper isn’t heavy, keeping your muscles tense for any length of time can cause pain.

- Stress can also affect the heart rate and breathing patterns. A relaxed breathing rate is usually 10 to 12 breaths per minute.

- Let’s time the number of breaths we take in one minute. Breathing in and then out is counted as one breath.

  - Is everyone ready? Let’s start counting now. How did everyone go?

  - Now what I would like you to do is to breathe in, hold your breath and count to five and then breathe out and say the word ‘relax’ to yourself in a calm soothing manner. We are going to do this repeatedly. Let’s begin.

  - Now I would like you to start breathing in through your nose and out slowly through your mouth. Breathing in for three seconds, then out for three seconds. This will produce a breathing rate of 10 breaths per minute. Let’s begin, we will do this for five minutes.

- I’m going to play you an example of a relaxation tape; something which is available from book stores and in some health shops.

- Now close your eyes and focus on the audio-tape

- *Would anyone like to discuss how they felt during this exercise or does anyone have any questions?*

- Here is a handout produced by BeyondBlue, which outlines aspects of stress management and relaxation techniques.
9. Concluding remark

· It is important to recognise the signs of stress because not only can it have a negative affect on your thinking, but chronic feelings of stress can also be a precursor for depression.

· This is the subject of our next session.

SEE NEW SLIDE

· Thank you for your participation today. See you all next week.
SESSION FIVE:

DEPRESSION

Causes, Effects and Management
SESSION FIVE: Depression – Causes, Effects and Management

(References: Iowa Health Centre; Better Health Channel; Handout in hall; AGS)

Objectives:

☐ Introduce Session

☐ Video Presentation “Understanding depression in your senior years”

☐ Present facts on depression

☐ Brief Video presentation on depression – Gary McDonald

☐ Brief Video presentation on depression – Gentleman post heart attack

☐ Discussion on how to recognise the symptoms of depression
  ☐ Behavioural changes
  ☐ Physical changes
  ☐ Thought pattern/mood changes

☐ Tea Break

☐ Discussion of treatments for depression
  ☐ Medications
  ☐ Psychological

☐ Discussion of risk factors for depression

☐ Review of places to seek help for depression

☐ Introduce next session topic
1. **Introduction**
   - Thank you all for attending today’s session
   - Here is a copy of the material being covered in today’s session.
   - We are going to spend some time looking at depression, signs, symptoms and how to manage this condition.

   **SEE NEW SLIDE**

   - Depression is a clinical disorder characterized by an inability to concentrate, changes to sleeping patterns, loss of appetite, inability to find pleasure in activities, feelings of extreme sadness, guilt, helplessness and hopelessness, and thoughts of death.

   **SEE NEW SLIDE**

   - Depression can affect anyone at any age. There are many famous people who have been diagnosed with depression at a particular point in their lives including the likes of Winston Churchill, Marlon Brando, Marilyn Monroe and even closer to home, the WA premier Dr. Geoff Gallop.

   - Let’s look at some facts about depression, by first reviewing this presentation.

2. **Video Presentation “Understanding Depression In Your Senior Years”**
   *(4'53” to 17’14”)*
3. **Fast facts about depression:**

   SEE NEW SLIDE

   - Symptoms of depression are common in older adults.
     NEXT

   - Signs and symptoms may be overlooked as just part of normal aging. Depression is not part of normal aging.
     NEXT

   - It is not simply a sad mood or phase that will pass.
     NEXT

   - It has many causes (another illness eg. Alzheimer's disease or stroke; Medications; Substance abuse; Loss and loneliness may all be factors in depression).

   - Sometimes no cause can be identified.
     NEXT

   - It can run in families.
     NEXT

   - Depression can be difficult to detect in older adults because physical and health problems can mask depression symptoms.
     NEXT

   - A person is at greater risk if they have suffered depression earlier in life.

   - Depression can damage a person’s quality of life and their relationships with friends and family.
     NEXT

   - Severe depression has been associated with increased risk of other disease eg. (a heart attack) and greater mortality.
     NEXT

   - Severe depression can be associated with suicidal thoughts and suicide. There is an increased risk of suicide with older age and as many as 75% of older adults who commit suicide are suffering from depression.

4. **Video Presentation of Gary McDonald**

   SEE NEW SLIDE

   - Let’s take a look at what Gary McDonald has to say about his experience of depression. You might recognise him as the character “Arthur” from the ABC series of “Mother and Son”. 
5. **Video Presentation of Gentleman describing depression following a heart attack**

"Let’s view this next clip of a gentleman discussing his perception of depression after he suffered a heart attack."

6. **Group Discussion**

- Would anyone here in the room like to share a personal experience with depression, either having experienced it oneself or in a friend or family member.
  - If yes in group, ask them to talk about the changes they noticed in the person.
  - If no one in group wants to discuss the issues, say “Well as we can see from the two short clips we just viewed; depression can affect anyone at any stage of their life.”
- Let’s review some of the important issues about depression.

7. **Depression – Recognising the symptoms**

- Importantly, older adults often do not recognise or report symptoms of depression.
- Sometimes a family member or friend will recognise changes in behaviour before the person with depression does.

- A GP may also routinely ask about aspects of mood, personality and current thinking patterns.
- Symptoms of depression may be reflected in changes to behaviour, thought pattern/mood and physical functioning.
Changes in behaviour include:

- Reducing the level of activity normally engaged in and withdrawing socially
- Neglecting to look after oneself (eg. decline in personal grooming)
- No longer enjoying previously fun activities
- Changes in appetite and weight (gain/loss)
- Restlessness/agitation

Physical symptoms include

- Alterations in sleep patterns (eg. sleeping more; trouble falling asleep; early wakening)
- A lack of energy or feeling very tired
- Slowing of movements

Thought pattern/mood differences:

- Feeling sad, irritable and/or anxious
- Feelings of worthlessness, helplessness, emptiness, guilt or burden
- Recurrent thoughts about death and suicide
- Problems with concentration and memory

Let’s have a tea break before we talk about ways of managing and treating depression.

8. Tea Break
9. Treatments for Depression

- Depression is a treatable illness. Early detection and treatment may help to keep depression from becoming severe.

- There are many treatments available for depression.

- The two main treatments are medication and counselling and a combination of the two may be best, particularly if the depression is severe.

- Some people will need to take medications for the rest of their lives, but many people can be stabilised after which the medication may be stopped.

    NEXT

- There are new antidepressants that have fewer side effects and that usually work well for older adults.

- Some drugs with specific side effects may be chosen (eg. a drug with a sedative action if there is insomnia).

- Usually it can take time before the benefits of antidepressants are recognised (sometimes up to six weeks).

- Treatment usually begins with a low dose, which is increased slowly and carefully.

    NEXT

- Psychological treatments for depression can focus on changing negative thought patterns, recognising situations that might trigger feelings that lead to depressive thoughts and improving relationships.

- Lifestyle changes may also be needed to assist with the treatment of depression. This might include looking at the person’s diet and nutrition. Changing exercise behaviours and encouraging involvement in social activities.

    SEE NEW SLIDE
10. Recognising Risk Factors for Depression

- Some risk factors may trigger depression. However, not all depression can be traced to a risk or cause.

- Risk factors for depression in older people may include:
  - Isolation – for example, living in a remote location or living in a different location to family and friends.

- Living in a nursing home or other care facility.

- Dementia – depression is common in people with dementia such as Alzheimer’s disease.

- Other physical health conditions including vitamin deficiencies, thyroid problems, heart disease, arthritis, Parkinson’s disease and cancer.

- Admission to hospital.

11. Seeking Help for Depression

- There are a number of different sources for help or advice on mood symptoms. These include:

  - A general practitioner

  - A psychologist or psychiatrist

  - Help lines

  - Hospital
12. Closing Comments

- Any questions?

SEE NEW SLIDE

- I have two handouts from BeyondBlue on depression. The first one “Depression in Older People” covers the details that we have talked about and is a nice reference about the signs, symptoms and management of depression.

- The second handout “What Causes Depression” provides information on how a combination of recent events and personal factors can increase the risk of developing depression.

- Thank you for attending today. I hope you have found this session interesting.

- I will see you all again next week when we cover issues related to sleep disturbance.
SESSION SIX:

SLEEP CHANGES
IN
THE OLDER ADULT
SESSION SIX: Sleep Changes in the Older Adult

(References: Handout/Booklet from previous study; Sleep Disorders Australia, HelpGuide.org)

Objectives:

- Introduce Session
  - Overview of problems of disturbed sleep
  - Video footage
  - Facts on disturbed sleep in older adults in WA

- Why is Sleep so Important?

- Discussion of Stages of Sleep

- Defining sleep problems
  - Recognising sleep problems
  - Recognising factors that might negatively influence sleep
    - Changes in routine/environment
    - Psychological/Emotional issues
    - Medications and insomnia
    - Pain and Illness
    - Sleep Apnoea and periodic limb movements

- Tea Break

- Discussion of ways to improve sleep using medication
  - Side effects of sleeping tablets

- Discussion of ways to improve sleep by making lifestyle changes
  - Good sleep hygiene
  - Sleep diary

- Group discussion/question time

- Closing statements and introduction of next session’s topic
1. **Introduction:**
   - Welcome back. Today we are going to spend time talking about an issue that will affect most people throughout some point in their lives. Sleeping difficulties.
   - Here is a copy of the material being covered in today’s session.

   **SEE NEW SLIDE**

   - More often than not, problems of disturbed sleep tend to be short lived, resolve spontaneously and do not significantly impact on the person’s quality of life.

   **NEXT**

   - Some people will however find that they experience more persisting and troublesome sleep disturbance that interferes with their daily functioning.

   **SEE NEW SLIDE**

   - Let’s have a quick look at some older adults describing changes they noticed in their sleeping patterns.

   *Present Video Clip – Maximising Physical Potential (3min. long)*

   **SEE NEW SLIDE**

   - A recent study conducted in Western Australia found that over 60% of older adults in contact with their general practitioner complain of poor sleep. This included problems such as trouble falling asleep, being restless or wakeful during the night, or having noticed early morning wakening.

   **SEE NEW SLIDE**

2. **Why is sleep so important?**

   - We need sleep to assist with memory and learning – Sleep seems to play a role in memory, by organising memories and solidifying learning in the brain. Poor sleep can impair concentration, memory and the ability to learn.

   - Individuals who are sleep deprived may also experience difficulty making decisions, poor judgement and an increase in risk taking. This has implications for work performance, daily functioning and driving.

   - Sleep also influences mood enhancement and social behaviours, with anxiety, depression and other emotional problems being associated with a chronic lack of sleep. Tired people are often cranky and more easily frustrated.

   - Sleep is also important for the immune system and general health – immunity is weakened without adequate sleep, making the body more vulnerable to infection and diseases.

   **SEE NEW SLIDE**
3. What’s Normal and What’s Not?

- It is important to recognise that changing features of our sleeping habits occur naturally and normally with ageing.

- As we age sleep becomes lighter and more interrupted.

- Commonly, older people may sleep less hours during the night and many will wake up once or twice (quite often to use the toilet).

- Before we look at some of the symptoms that might suggest a sleep disturbance, let’s review the basic processes involved in normal sleep patterns.

- We go through a number of phases when we sleep as illustrated by this diagram (refer to slide)

  - **Stage 1 (Drowsiness)** – This is the first stage, of falling asleep and it lasts for five or ten minutes. Your eyes will move slowly under the eyelids, and muscle activity slows down. You then start to move into...

  - **Stage 2 (Light Sleep)** – Your eye movements stop, your heart rate slows, and your body temperature decreases.

  - **Stages 3 & 4 (Deep Sleep)** - During these next stages, 3 and 4, you are difficult to awaken. People who are woken up during Deep Sleep do not adjust immediately and often feel groggy and disoriented for several minutes after they wake up.

  - **REM sleep** - At about 70 to 90 minutes into your sleep cycle, you enter another phase of sleep called Rapid Eye Movement or REM sleep. You usually have three to five REM episodes per night and during this phase, your eyes jerk rapidly in various directions under your eyelids.

    - The first sleep cycles each night contain relatively short REM periods and long periods of deep sleep.

    - As the night progresses, REM sleep periods increase in length while deep sleep decreases.

    - By morning, people spend nearly all their sleep time in stages 1, 2, and REM.

    - As we get older, there is a steady decline in the amount of deep sleep, and increase in the amount of time spent in stages one and two, with little change in REM.

SEE NEW SLIDE
Examples of sleeping behaviours that may suggest a problem include

- Trouble falling asleep: Whilst it is not unusual to take some time to fall asleep, if it takes you an hour or more to fall asleep once you are in bed, this may suggest a problem.

- Whilst it is not unusual to wake up during the night, being unable to fall back to sleep is not normal.

- Feeling tired and unrefreshed in the morning and throughout the day

- Excessive day time sleepiness

- Excessive snoring and intermittent breathing problems at night (Sleep Apnoea, which we will talk a little more about later)

- Restlessness when you sleep (excessive movement or kicking – and we will also look at this again later in the session)
There are a number of intrusive factors that can influence sleep, including:

- Changes in routine such as occurs with travelling (eg. different time zones) or undertaking shift work. Change in environment such as occur with moving house, having visitors come to stay or noisy neighbours.

- Psychological/Emotional issues such as stress, anxiety and depression. We have covered these topics already and we know that if you are worried about things or are depressed you might have trouble falling asleep or might wake early in the morning and not be able to resume sleep.

- Medications can also affect quality of sleep. These include prescription medications and over the counter products from the chemist.
  
  - Some medications used to treat cardiovascular conditions (eg. hypertension or angina) can cause tiredness and upset sleeping patterns

  - Corticosteroids, used to treat a variety of medical conditions can cause insomnia, as can some epilepsy medications and those used to treat respiratory conditions and thyroid disorders.

  - Some antidepressants can influence sleep patterns, and

  - Diuretics and some decongestants can also cause drowsiness or have the opposite effect and cause insomnia.

  - These are just a few examples and there are many more different types of medications that can influence sleep.

- If you suspect your medications might be affecting your sleep hygiene you should consult your GP. Do not cease taking prescription medications without talking to your GP.

- Pain and Illness – arthritis, osteoporosis, Parkinson’s disease, incontinence, indigestion, heart disease and lung disease can impact on sleep. People that suffer pain at night, will lose hours of sleep, causing them to feel tired during the day.

- Sleep Apnoea and periodic limb movement disorder – both of these conditions have a significant impact on sleep, causing frequent arousals and resulting in daytime tiredness.
· Sleep apnoea occurs when the airway from the mouth to the lung collapses during sleep and an individual may have hundreds of these episodes throughout the night which disrupt sleep and starve the body of oxygen.

· Individuals with periodic limb movement disorder suffer from involuntary leg movements during sleep that occur every 10 to 60 seconds and for periods lasting anywhere from a few minutes to several hours. These movements can wake people, disturb their sleep and awaken bed partners.

NEXT

· Cola/Tea/Coffee, Nicotine and Alcohol – Caffeine and nicotine are stimulants and will make it harder for you to fall asleep. Some people will consume alcohol to promote sleep. However when alcohol is consumed within an hour of bedtime it disrupts sleep patterns, causing awakening and difficulty resuming sleep.

SEE NEW SLIDE

· Let’s have a tea break and when we come back, we will talk about the ways we can improve sleep. We will address the use of medications and the role of lifestyle changes.

4. Tea Break

SEE NEW SLIDE
5. Improving Sleep – Using Medication

SEE NEW SLIDE

- Whilst some prescription medications may be helpful in situations of insomnia, they are also associated with a number of side effects that you should be mindful of.

NEXT

- The mostly frequently prescribed medications for sleep in Australia are a group of drugs known as ‘benzodiazepines’ (eg. Lorazepam, Temazepam, Diazepam)

SEE NEXT SLIDE

- This class of drugs can have negative effects on your sleeping pattern, causing you to wake more frequently during the night and having less deep sleep.

- They produce tolerance, meaning that it is necessary to increase the dosage of the medication with time to maintain the same clinical effect. Sleeping tablets can therefore lead to dependence when used for prolonged periods of time (3 or more months).

- If someone is dependent on sleeping tablets then abruptly stopping these may lead to withdrawal symptoms such as irritability, sweating, nausea, dizziness, insomnia, anxiety, headaches and tremor. However these symptoms will usually subside after 2-5 days.

SEE NEXT SLIDE

- Other side effects of sleeping tablets include:
  - Drowsiness during the day
  - Slower reaction time
  - Impaired judgement, memory and concentration
  - Problems with co-ordination
  - Anger, irritability and mood swings
  - Feeling panicky
  - Incontinence
  - Increased risk of falls and fractures

SEE NEXT SLIDE

- The best clinical evidence currently available suggests that sleeping tablets should not be used regularly and certainly not for prolonged periods of time (3 months or more).

NEXT

- If you are concerned regarding any medication that you might be taking, you should consult with your GP. Do not cease taking prescription medications without talking to your GP.
6. Improving Sleep – Lifestyle Changes

- Adopt a regular sleep-wake schedule – it’s very important to get into a regular routine with your sleep-wake cycle, even on the weekends.

- Check your sleep environment – your bedroom should be pleasantly warm, dark and quiet. Make sure your bed is comfortable (e.g. mattress, pillows).

- Wind down before going to bed – try to do something relaxing and different from your daily routine, such as reading or listening to music at least 30 minutes before sleeping time.

- Use your bed to sleep – the bedroom should be used to sleep and for sexual activity. Avoid listening to the radio and watching TV in bed. Activities such as eating, drinking, arguing, discussing the day’s problems or playing games should also be done elsewhere.

- Avoid worrying in bed – most people will have trouble falling to sleep if they are worrying about things. If you are in bed for 30 minutes and are unable to go to sleep get up and do something else (e.g. reading); go back to bed once you start feeling sleepy again.

- Be mindful of the effects of alcohol and caffeine – avoid drinking coffee/tea, and other drinks that contain caffeine, excessively during the day or at least a few hours before your normal bedtime due to its stimulant effects. Whilst a small quantity of alcohol (e.g. a glass of wine) can be relaxing before bedtime, consuming larger amounts may disrupt sleep during the night. Some people also find that smoking disrupts their sleeping pattern.

- Avoid excessive eating at night – rather, a light high-tryptophan (an essential amino acid) snack before bedtime (glass of milk; banana) can promote sleep onset in some people.

- Regular physical activity – exercising 20-30 minutes most days of the week is not only good for your general health, it also promotes good sleep. However, you should avoid exercising two to three hours before bedtime, as the stimulation associated with physical activity may delay sleep onset.

- Learning and practicing relaxation techniques (e.g. Yoga, breathing techniques, warm bath) will also aid falling asleep.

SEE NEXT SLIDE
· Keep a diary of your sleep patterns and activities that might be affecting your self. Do this for one week. Each evening record the times during the day when you
  · Eat meals
  · Drank tea, coffee, cocoa, cola drinks, alcohol
  · Took naps

In the morning record
  · The time you wake up (with or without an alarm)
  · The time you get out of bed
  · How long it took to fall asleep
  · The amount of time you are asleep and any time awake at night (don’t watch the clock at night though!)

<table>
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<th>Activity</th>
<th>Sleep Patterns</th>
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<td>Ate dinner; glass of red wine</td>
<td></td>
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<tr>
<td>7pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9pm</td>
<td>Cup of tea; biscuit</td>
<td></td>
</tr>
<tr>
<td>10pm</td>
<td></td>
<td>Bed -10.30 asleep</td>
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<tr>
<td>11pm</td>
<td></td>
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<tr>
<td>12am</td>
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<td></td>
</tr>
<tr>
<td>1am</td>
<td></td>
<td>Woken up by noise outside</td>
</tr>
</tbody>
</table>

7. **Group discussion about material covered.**

8. **Closing**
   
   · Thank you all for attending today. Here is a brochure that covers some of the features of today’s session.

   · Next week we are going to look at volunteering and community activities and ways you can get actively involved.

   · See you all then.
SESSION SEVEN:

OLDER BUT NOT “OLD”

Challenging the Negative Stereotypes
SESSION SEVEN: Older but not “Old”

(References: Lehr, Seiler & Thomae (2000); Dein and Dickens (1997); Einstein and McDaniel; Better Health Channel; Topic Sheet on Volunteering in WA; Volunteering WA)

Objectives:

Part One: What it means to be an older adult in society – Challenging the negative stereotypes

☐ Introduce topic

☐ What is the meaning of “old age”
  ☐ Discuss concept of old age in western society
  ☐ Emphasis in modern society on technology and preservation of cognition

☐ Present video footage on ageism in the workforce

☐ Challenging cognitive perceptions of the older adult
  ☐ Age is a “state of mind”
  ☐ Video Presentation
  ☐ Group Discussion

Part Two: Volunteering – ways to continue to be valuable contributing members of society

☐ Introduce topic
  ☐ Review statistics and brief facts on volunteering

☐ Discuss benefits of volunteering
  ☐ Who benefits
  ☐ Opportunities provided by volunteering

☐ Tea Break

☐ Discuss types of volunteer activities
  ☐ Common/less common examples; Local neighbourhood activities

☐ Group discussion on personal experiences of volunteering

☐ Deciding if Volunteering is right for the individual

☐ Review ways to obtain more information about volunteering

☐ Introduce next session topic
1. Introduction

- Today we are going to start our discussion with views on ageing and older adults in the work place, followed by ways in which older adults can continue to be valuable contributing members in society.

- Here is a copy of the material being covered in today’s session.

SEE NEW SLIDE

2. What is the meaning of “Old Age”

- Everybody ages, this is a universal phenomenon; however the concept of “old age” is not only a biological process, but is also strongly defined by social and cultural norms.

NEW SLIDE

- In Western society, the concept of age and life course is determined by various stages/events such as starting school, entering the work force and retirement. It is the point of retirement, around the age of 65, which is perceived by Western Society as “old age”.

NEW SLIDE

- In today’s modern society emphasis is often placed on being able to keep up to date with the latest technological innovations, computers and the Internet, with increased cultural importance placed on cognition and the preservation of sharp mental abilities.

NEXT

- As such, Western society tends to hold more negative stereotypes of ageing, with expectations of older adults having poorer cognitive abilities and being less productive in their contribution to society post the age of retirement.

- Let’s take a look at some comments during this video footage regarding ageism and the work force in modern society.

- Brief video presentation on ageism from “Work retirement and economic status” (18.34-20.52).

- Have any of you experienced ageism?

SEE NEW SLIDE
3. Age is a State of Mind…

- There are examples that challenge negative stereotypes associated with older age.
- Many might say that age and cognitive decline are merely a state of mind. Many would comment that a person is only as old as they feel and our perceptions of our capabilities influence how we think about our memory and other skills.
- Take for instance the late Dr. F. W. Sunderman, who died in 2003 at the age of 104. At age 102 he was still working at the Institute for Clinical Science at Pennsylvania Hospital in Philadelphia.

SEE NEW SLIDE

4. Video Presentation (7.30 report or CBS news footage)

- Let’s have a look at footage of other older adults who have continued to work beyond retirement years.

5. Newspaper Articles

- I also have some examples from the media of fit and healthy older adults who are fit and healthy and who have continued to remain active and productive into their senior years.
- For example: (review copies of newspaper articles)
- How does it make you feel when you see these sorts of images as presented in the video and in these examples taken from the media? Are you inspired by it? Does it change the way you think about having retired from the workforce?
- Whilst you might not be interested in maintaining a role in the workforce, there are many other ways you can still contribute to society and remain actively involved in the community. One example of this is becoming a Volunteer.

SEE NEW SLIDE

6. Volunteering

- A volunteer is someone who chooses to use their skills and time, for free, to help out in the community and not-for profit organisations.
- You may not realise, but volunteers are considered valuable, contributing members of the community, who use their skills and interests to benefit others.
- The range of available volunteer activities is wide and can involve fundraising, teaching, or simply regularly helping out people in your neighbourhood.

NEW SLIDE
Session Seven: Older but no “Old”

· Viewing the statistics on volunteering, as compiled by the Department for Community Development, reveals that in WA alone in the year 2000:
  · A third of our population engaged in some form of volunteer activity.
  · The amount of hours contributed by volunteers in WA is over 70 million a year.
  · This equates to some 800 million dollars (based on a minimum wage of $11.00 per hour).

7. Who benefits from volunteering?

SEE NEW SLIDE

· Everyone benefits from volunteering
  · The individual
  · The community
  · The economy

· People who volunteer report experiencing increased feelings of self confidence, self worth, belonging and fulfilment.

NEXT

· Volunteering provides opportunity to -
  · Develop knowledge and skill
  · Become involved and participate in the local community
  · Make a difference in somewhere else’s life, by sharing experiences and helping others.
  · Stay active, socialise and make new friends

· Volunteering contributes to the health and well being of the community by increasing social cohesiveness and strengthening the community spirit.

· According to the Department for Community and Development, 1/5 of the volunteers in WA in the year 2000 were people over the age of 55, with “personal satisfaction” being the main reason for volunteering.

SEE NEW SLIDE

8. Tea Break

· Let’s have a tea break and when we come back, we are going to look at the different types of volunteer activities that people can become involved in, as well as to share some of our own personal experiences.
8. What sorts of things do volunteers do?

- When you think of volunteering activities, most people think of
  - Charity fundraising, Meal deliveries, Volunteer driving
- Your participation in this research project is a form of volunteer work as it serves the greater community, by improving knowledge so future generations will benefit.

- Other examples include
  - Tree planting
  - Teaching/tutoring
  - Committee work
  - Clerical positions
  - Coaching/Refereeing
  - Befriending/Supportive counselling
  - Gardening
  - Performing/media production

SEE NEW SLIDE
There are many other ways you can volunteer which you may have never considered and that would be of enormous benefit to your community. These include:

- Working with people with disabilities

- Tutoring culturally and linguistically diverse people

- Offering to help with volunteer State Emergency Service activities.

- School Volunteer Program – community volunteers go into a school and mentor a young person one-on-one for a minimum of one hour per week. Volunteers trained and taught about issues confronting you people.

Volunteering doesn’t need to take up a lot of your time. It could be performed as locally as your own neighbourhood. For example:

- Joining Neighbourhood Watch

- Offering to help a frail neighbour with gardening, shopping or other support around their home (eg. walking their dog).

- Help out at the local primary school or kindergarten with fundraising, reading assistance or a sports carnival.
9. Group Discussion Regarding Personal Experiences

SEE NEW SLIDE

10. How do I know if Volunteering is for me?

· Firstly, think about how many hours each week you spend on other activities such as:
  · Working
  · Study
  · Entertainment
  · Family
  · Travel

SEE NEW SLIDE

· How much free time do you have to devote to volunteering?

SEE NEW SLIDE

· Then consider if you would like the opportunity to:
  · Give something back to the community
  · Work for social change
  · Have fun
  · Learn new skills
  · Meet new people
  · Help others
  · Gain experience

SEE NEW SLIDE

· Volunteers are of every age, every culture and every level of ability.

SEE NEW SLIDE

· People who volunteer give reasons for doing so such as:
  · “I wanted to use my skills and talents”
  · “I wanted to meet new people”
  · “I wanted to give something back to the community”
  · “It helped me feel useful”
12. Obtaining more information about volunteering:

SEE NEW SLIDE

- Volunteering WA is a membership based organisation.

- The aims of this organisation are to link volunteers with community based, not for profit agencies.

NEXT

- Volunteering Western Australia provides a free information session for people who are considering volunteering for the first time, or those who are already volunteers, though are interested in exploring alternative volunteer experiences.

- By attending one of their sessions you can learn more about:

  - The benefits you can gain by becoming a volunteer
  - Different volunteering opportunities that are available
  - What types of skills you might have to offer as a volunteer
  - Your rights and responsibilities as a volunteer and the agencies you might work for or represent
  - Finding the right position for you

NEXT

- The sessions usually last for an hour and are held at

SEE NEW SLIDE

- Volunteering WA.
  - City West Lotteries House, 2 Delhi Street, West Perth 9482 4333 Joondalup contact details: 9400 4734
  - www.volunteer.org.au
  - www.govolunteer.com.au

- Here is a brochure produced by Volunteering WA. It provides you with this contact information.

SEE NEW SLIDE

- For those of you living more south of the river, there is the Fremantle Volunteer Service, 245 South Terrace, South Fremantle WA 6162. 9335 3394.
13. Closing

SEE NEW SLIDE

• Thank you for attending today.

• Hopefully you have been inspired by today’s session in looking at other ways to maintain involvement in the community.

• Next week’s topic is also going to explore issues related to retirement and other lifestyle activities.
SESSION EIGHT:

ENJOYING RETIREMENT
SESSION EIGHT: Enjoying Retirement

(References: University of Iowa Health Topics; Better Health Channel; The AGS foundation for ageing health.)

Objectives:

- Introduce Session

- Discuss implications of retirement
  - Involvement in different levels and types of activities
  - Group discussion regarding expectations of level of activity in retirement and challenges faced

- Discussion of different types of activities/opportunities in retirement
  - Provision of examples of potential new hobbies
  - Group activity devising examples of hobbies

- Tea Break

- Discussion about travelling in retirement
  - Vacation destinations
  - Health issues
  - Making the most of the trip
  - Group discussion of recent travel exploits

- Discussion regarding the health benefits of having a pet
  - Review of issues to consider when purchasing a pet
  - Group discussion regarding personal experiences of owning a pet

- Introduce next session topic
1. Introduction

- Thank you all for attending today’s session.
- Today we are going to discuss an issue which affects most of you – retirement.
- Here is a copy of the material being covered in today’s session.

   SEE NEW SLIDE

- Retirement may be defined as “Withdrawal from one’s occupation, position or office”. However, it has different meanings for different people and this is something we are going to explore in this session.

2. Retirement – Different strokes for different folks?

   SEE NEW SLIDE

- One of the most dramatic changes in older age we go through involves retirement.

   NEXT

- Retirement has implications for identity in terms of work, relationship and social roles; economic and social status. It tends to mean different things for each individual and can be associated with both positive and negative emotions.

- Some view retirement as an opportunity to “smell the roses”; for others retirement provides time to undertake new and different activities that there was never time for when they were in paid employment.

- The idea of being able to catch up on hobbies, take up new activities or enjoy newfound time with family and friends may have brought excitement and pleasure.

   NEXT

- However some might find it difficult to remain interested and occupied and spending time on hobbies and interests, may not turn out to be as rewarding and meaningful as anticipated.

   SEE NEW SLIDE
Session Eight: Enjoying Retirement

- Older adults may add the role of grandparent, which brings both new rewards and new demands. Grandparents may find they are expected to baby sit more often than they would prefer.

- Another issue that many might not have considered was the impact that retirement would have on their relationship with their partner. Spouses may find themselves spending much more time together than they ever did before.

- Partner issues can include differing (and conflicting) ideas on retirement lifestyle. One partner may want to keep busy with travel, hobbies and volunteer work, while the other expects a more relaxed daily routine.

- Additionally, it may be difficult to work out how much time to spend together. If one partner is outgoing and social, while the other is more introspective, tension may arise if the outgoing partner feels ignored, while the introspective partner could feel harassed.

- On the other hand, some people may try to do everything as a couple, but lack of personal space can cause stress and relationship conflicts.

- Further, some may have been looking forward to becoming more socially and physically active only to have become confronted by limitations associated with illness or physical disability, either personally or by someone else in the family.
3. **Group Discussion**

SEE NEW SLIDE

- Are any of these issues things that people have experienced? What did you do to cope with these sorts of things? “What is the right time or age to retire?”

SEE NEW SLIDE

4. **Retirement – “Variety is the spice of life”**

- People who plan an active life tend to be happier than those who have no plans or routines. Daily routine and activities add purpose to life.

NEXT

- However it is important to try to strike up a balance.

- If there is nothing in particular to do or look forward to on any given day, a person is more likely to feel bored and depressed than a person who lives an active meaningful life.

- If one takes on too many activities they may place themselves under undue pressure to accomplish things in unmanageable time frames. This may lead to stress and anxiety.

- Some of you might already be happy with the types of activities you are undertaking in your week.

- Some of you might soon be finishing a course and looking for something new to replace it.

- Others of you may have reached a point where you are ready to explore some new and interesting ways to fill in some of your time.

SEE NEW SLIDE

There are a number of different activities that can be explored in retirement.

- We have already spent some time discussing volunteer work.

  - As we talked about, volunteering can be a satisfying way to add structure and purpose to your life, with there being a variety of different activities to choose from.

NEXT

- In one of the earlier sessions we also talked about the benefits of physical activity in reducing the risk of health problems.

  - Regular exercise can also provide a social element to your weekly routine. Join a class, walking club or team sport. These can provide the opportunity for interaction with individuals who have similar interests.

NEXT

- Think about all those hobbies you wanted to try but didn’t have the time for previously. There are many available resources in the community.
5. **Group Activity**

- Let’s come up with a list of different hobbies (start group off with some examples - Book clubs, Cooking or craft classes, Dancing, Antique collecting, Learning to play poker, Learning to play an instrument, Camping groups, Photography, Cycling clubs).

SEE NEW SLIDE

6. **Continuing Education**

- There are also plenty of opportunities for further study including –
  
  - Learning a language
  - Studying literature, history, the environmental issues or science
  - Taking acting classes

SEE NEW SLIDE

- Learning can take place on-line, in classes or in your home.

SEE NEW SLIDE

- Have any of you heard of the “The University of the Third Age”?

SEE NEW SLIDE

- The U3A (UWA) provides learning opportunities for people in their retirement years, living in the Perth Metropolitan area; in an informal and unstructured environment.

SEE NEW SLIDE

- U3A is open to anyone over the age of 50 and offers opportunities to interact through learning and teaching.

SEE NEW SLIDE

- There are no entry qualifications, no examinations and no diplomas. You can be both a student and a course leader.

SEE NEW SLIDE

- U3A is a voluntary organisation and its success depends on the willing participation of members at all levels (eg. running a course, helping with the administration of the organisation, as an occasional speaker to groups or simply by taking part in what is offered).

- It runs study groups, occasional workshops and seminars, lectures and from time to time educational outings.

7. **Group Discussion**

- What sorts of activities are people currently doing; what’s enjoyable; what has become more of a chore. What are the benefits/costs?
8. Tea Break

9. Travelling? Forgotten something?

- Another popular activity in retirement is travelling.
  - This might mean regular trips out to the Swan Valley, or down to Margaret River. Some of you may have also taken trips more broadly around Australia, others of you may have gone on cruises or travelled to see family members overseas.
  - Some of you might be considering taking a trip to escape winter/summer or to travel to a place that you’ve always wished to visit though never before had the opportunity.

- Before you begin travelling there are a number of things you should consider.

  - When choosing a vacation destination
    - Consult with your travel agent for suggestions. You don’t want to pay for a trip on a cruise ship only to realise that it is for younger “30 somethings”. Similarly, if you were planning on doing some hiking, make sure that your level of fitness is catered for.

  - Research important factors such as climate, language and culture. Buy a guidebook and read it before you go.

  - Be mindful of health treatment options and medical issues
    - Think about your medical needs and the available medical facilities in the areas you will be visiting and organise travel insurance with pre-existing illness cover if needed.
    - It is a good idea to have a medical checkup with your doctor and any other specialists regularly involved in your care.

  - Talk to your doctor about your medications, what you will need to take with you how to safely stagger medications to fit different time zones and what medications might be illegal overseas. Ask about vaccinations as well.

  - Wear a bracelet or pendant containing your medical details to inform others of your medical complaint in case you need urgent help.
Don’t forget to consider the possible impact on your health from dietary changes and different eating habits (eg. if gluten intolerant).

SEE NEW SLIDE

10. Travelling - Making the Most of Your Trip

- Allow time to recover from jet lag; this might mean taking it easy for a day or two each side of your travel. The effects of jet lag might also be lessened if you fly west instead of east.

SEE NEW SLIDE

- Don't draw up a jam-packed itinerary for each and every day of your holiday – arrange for plenty of rest breaks, particularly in hot weather.

SEE NEW SLIDE

- Seniors cards are only supposed to offer benefits within your home, but flashing the card at museums and other attractions may get you a cheaper entry ticket.

SEE NEW SLIDE

- Thieves and pickpockets may consider older people as easy targets, so don’t:
  - Don't travel around at night
  - Don't wear expensive jewellery on obvious display. You can purchase a belt and wallet which are worn under your clothes and against your skin to keep valuables (such as traveller's cheques and credit cards) safe and out of obvious sight.

SEE NEW SLIDE

- Carry with you at all times the contact details of the Australian embassy and important medical numbers.

- It’s worthwhile recognising that each of the travelling hints can also be applied to aspects of your everyday lifestyle, particularly when it comes to the management of your personal health and safety.

SEE NEW SLIDE

11. Group Discussion

- Has anyone recently been on holidays?

- A person may not be comfortable undertaking activities in the community, travelling or socialising, however it is important to recognise that loneliness can be a common source of depression.

- Whilst it is important to maintain and even increase social networks, some people find that even owning a pet can fill a void in their lives.

- We have all heard about the benefits of certain diets and physical activity for maintaining health and well being. How many of you are aware of the treatment benefits of owning a pet?

  SEE NEW SLIDE

  - Scientific research has found that older adults who own pets tend to:

    - Have lower levels of stress and be less vulnerable to depression and suicide

      NEXT

    - Be better at coping with grief and loss

      NEXT

    - Be more active

      NEXT

    - Have increased feelings of personal security

      SEE NEW SLIDE

- There are however a number of things to consider when choosing the ideal pet for you:

  - You need to bear in mind the level of care required.
    - Whilst dogs are one of the friendliest and most loving animals, they need care and attention (e.g. walking; grooming). On the other hand, you can take care of a goldfish in a bowl in a couple of minutes, but it may not be as rewarding a companion.

    - What about the space available in your home; what sort of kind and size of pet would suit your house?

      NEXT

  - Don’t forget the costs associated with owning a pet.
    - Some pets may have greater health and medical needs (e.g. immunisations, vet bills, neutering or spaying, and food). You can find out about these sorts of costs when choosing your new pet from the animal shelter, pet store or vet.

      NEXT

  - Also, be mindful of the affects of any allergies you might have and the type of pet you choose.

      NEXT
If you have never had a pet before, you might consider volunteering to help out with looking after a friend or family member’s pet whilst they are away and see whether you enjoy this experience. Helping out at an animal shelter might also give you some added satisfaction, without having all the responsibility.

Most people find that there is some kind of pet that they enjoy and can afford. A pet of any kind is a serious responsibility.

Do not get a pet for a friend or relative until you have discussed it with them and have thought about what you will do if he or she cannot care for it. In the same way, it is a good idea to discuss what might happen to pets if someone moves to a nursing home or another facility that will not allow pets.
13. **Group Discussion**

- How many of you own pets? How has this impacted on aspects of your lifestyle? Does owning a pet provide more opportunity to meet people/socialise?

14. **Closing Comments**

- I hope today’s discussion has provided you with some helpful hints about remaining active and interested about retirement.

- Next week we are going to explore some of the cultural issues associated with ageing and how society’s perception can influence how we think about ourselves as we get older.

SEE NEW SLIDE

- Thanks for your participation today. I’ll see you all next week.
SESSION NINE:

OLDER, WISER AND SAFER
SESSION NINE: Older, Wiser and Safer

(References: Alzheimer’s Association “Legal Consideration; “Safe and Secure Living”; “How to be Consumer Wise”, MayoClinic; Fire Safety Council; “Crime Prevention for Seniors”)

Objectives:

- Introduce Session
- Safety in the Home
  - Fire Safety Tips
  - Home Security
  - Personal Security in the Home
  - Personal Security in the Street
- Group Discussion
- Tea Break
- Making Provisions for Medical Emergencies
  - Creating an information sheet
- Planning for the Future: Wills
  - Important facts about Wills
- Planning for the Future: Power of Attorney and Guardianship
  - Definitions and Terminology
- Group Discussion
- Introduce next session topic
1. Introduction

· Today we are going to discuss a number of issues related to safety both in the home and financially.

· Here is a copy of the material being covered in today’s session.

2. Safety in the Home

· Being mindful of a few basic home safety precautions can go a long way to ensuring that you are kept safe, reduce the risk of injury and continue to live independently in your home.

· Firstly, we will talk about some basic fire safety tips.

   · Fire Safety Tips: These are general tips. For more extensive and detailed advice, you should contact your local fire department.

   · Seniors are at risk because many live alone, with no one close at hand if they need help. They may also be on medication, or have physical ailments that might impair their mobility or their ability to make quick decisions. In addition, many seniors do not know what to do in case of fire.

   · Be prepared for fire. Know exactly what to do and where to go if there is a fire. Plan your escape routes. Know two ways out of every room where possible. Make sure you can unlock all doors and open all windows.

   · Install smoke alarms and make sure they work by checking them regularly.

   · Keep heaters way from everything – including you. Have them at least one metre away from objects.

   · When cooking, wear tight fitting or rolled up sleeves and don’t reach across a hot burner. If a pot catches fire, cover it with a lid and turn off the burner. Never leave cooking unattended.

   · If your clothing catches fire, lower yourself to the ground, cover your face with your hands and roll back and forth to put the flames out.

   · Crawl low under smoke. Most fire victims die from smoke, not flames. Smoke always rises, so you must get down on the floor where the air is cleaner. Crawl on your hands and knees to safety.
Next we are going to spend some time going over some general information about home security. These tips, and more, are covered in this booklet you will be provided with. Again, if you would like to know more, you should contact your local police department.

Home Security:

- Do not place spare keys outside or around your home. Leave them with a neighbour, relative or friend.

- Cut bushes and trees which obscure windows. Remove any bushes than can provide a hiding place for an intruder.

- Secure your electricity supply meter box.

- Make sure your house number is easy to see from the street for easy viewing in emergencies.

- Leave lights on inside and out.

- Install a telephone in the bedroom.

- Identify and mark your property and keep an inventory of all of your valuable items – record serial numbers, makes, models, colour sizes etc.

- Invest in a good quality security door and deadlocks on main entrance/exit doors. If deadlocks require a key to open from the inside, leave the keys in the locks when you are at home.

- Install a peephole in the main front and rear doors.

- Get to know your neighbours and keep a look out for each other’s safety.

SEE NEW SLIDE
Now I am going to provide you with some general strategies that you can implement as safety precautions to help deal with threatening situations in your home. Again, this information is covered in your notes and in this booklet (Hold up handout) you will be provided with.

Importantly, these are general tips and are by no means extensive. You can contact your local police for additional helpful suggestions:

**Personal Safety at Home:**

- It may sound obvious, but you should always be careful who you let in your home. Open your door only to people you know and trust.

- Check the credentials of service repair people or salespersons and do not let charity collectors in to your home. If you are uncertain about someone, ask for their identification and if they are from an organisation, telephone the company and check.

- If someone comes to the door to ask for a drink, to use the toilet or telephone, do not open the door, direct them to the nearest public facilities or make the call for them. Under no circumstances should you let a stranger in to your home.

- If someone is at the door and you are alone and worried, pretend there is someone else in the house…Call out “It’s ok, there is just a X at the front door…I won’t be a minute”.

- If you hear a noise at night, turn on all of your lights. Make sure that you always keep the outside of your home well lit at night.

- When speaking to unknown callers on the telephone, do not give your name, number, address or any details of who lives in the house.

- If you arrive home and suspect there is an intruder inside, do not enter the house. Go to a neighbour’s house and call the police. Keep out of sight and a safe distance from the house. Make a note of the description of anyone you see leaving the house as well as of any vehicles and their registration numbers.

- If at home and you notice an intruder on your property, activate a burglar alarm if you have one, go to the nearest phone and telephone the police, switch on lights and make a lot of noise, but do not confront the intruder. If the intruder confronts you, try to stay calm but shout and scream, particularly if you think this might alert your neighbours.
Session Nine: Older, Wiser and Safer

Personal Safety in the Street:

- Independence in the community is important to all people of all ages. Here are a few tips to help keep you safe on the street.

- Carry your handbag in front of you close to your body. You might want to keep your money, cards and keys in a separate wallet or money belt or inside a jacket. **NEXT**

- Carry only the money you need and if carrying a bag, keep it with you at all times, do not leave it in a trolley or at your feet when seated in public places.

- Consider setting up electronic bill paying and banking facilities, that way you can avoid having to carry large amounts of cash around with you. **NEXT**

- If confronted by someone trying to take your bag, give it to them. This may go against all of your instincts, but no amount of money or inconvenience is worth personal injury. Try to remain calm and take note of the appearance of the individual and the vehicle if one is involved. Call the police straight away. **NEXT**

- Do not walk close to the kerb and vary the route and times that you go shopping. **NEXT**

- Be observant and consider shopping with a friend or relative. **NEXT**

- If travelling on public transport, take the seat closest to the driver or select train carriages with lots of people in them, or those close to guards. **NEXT**

- Carefully plan your route when driving and never pick up a hitchhiker. **NEXT**

- Park your car in well lit areas, don’t leave valuables in sight and have your keys ready as you walk to the car. **NEXT**

- Consider carrying a personal security device, which is a compact alarm that will act as a deterrent. **NEXT**

- Does any one have any questions or something they would like to discuss before we have our tea break? **SEE NEW SLIDE**

3. Tea Break
4. Medical Information

- We are going to stay on the topic of personal safety for just a little longer, though now we will look at being prepared for medical emergencies.

- If you had a medical emergency, would those close to you have the information needed to provide to doctors looking after your care? Would they know about the medications you take? Would they know about the surgery you have previously had or who the regular specialists involved in your care are?

- Here is a list of eight things you should keep a record of and that should be provided to those closest to you who would assist you in an emergency. You might also think about keeping this information on your fridge and by the telephone:

1. Names of doctors – your GP can be contacted in an emergency and provide up to date information about your medical management

2. Your birth date – medical records at hospital will ask for this information

3. List of allergies – especially important if you are allergic to medications

4. Major medical problems

5. List of current medications

6. Prior surgical history

7. Lifestyle information – smoker; consumer of alcohol

8. Religious beliefs/Advance directives – do you have certain religious beliefs that might influence the type of care you would want to receive? Have you made a legal document outlining decisions about your health care eg. resuscitation efforts.

SEE NEW SLIDE
5. Being Prepared For The Future: Wills

- More than half of the Australian population neglect to make a Will, yet it is an essential part of financial planning and need not be complicated or expensive. Here are some brief facts about Wills that you might not have thought or known about.

NEXT

- If a person dies intestate, that is without leaving a Will, their estate is divided according to the law and they will have no say in how the estate is distributed.

NEXT

- By having a Will a person can ensure that their property, valuables and personal items are distributed according to their wishes.

NEXT

- It doesn’t matter how much things are worth; items may be of sentimental value only or one may wish to make provisions for the care of others or even pets.

NEXT

- It is not commonly known that marriage automatically cancels all previous wills. If a person made a Will before marrying and still wants to continue to provide for the beneficiaries nominated in that Will or wishes to make arrangements to cater for the new circumstances, a new Will must be made.

NEXT

- In Western Australia, divorce does not automatically cancel a Will. A divorced former spouse could still inherit the estate under the previous Will unless a new one is made.

NEXT

- If someone dies without a Will the de facto partner may not automatically be entitled to the estate. He or she might stand to lose the assets and treasured mementos that one wanted them to have.

SEE NEW SLIDE

- A Will can also be used to specify the type of funeral wanted.

NEXT

- A professionally drawn and executed Will greatly assists the cost-efficient administration of the estate and the early distribution of assets to the beneficiaries named in the Will.

NEXT

- When making a Will, an executor is appointed who is responsible for looking after the estate and distributing the assets according to the instructions contained in the Will.

NEXT

- Always seek legal advice that relates specifically to your own personal needs. You can contact the Office of the Public Trustee on 9222 6777 for more information.

SEE NEW SLIDE

- There may come a time when a person requires someone else to manage their financial affairs or to make decisions about their well being. A person might have an accident or develop a sudden illness; or there may be a planned or unexpected absence, for example, if the individual needed to travel overseas.

- Legal provision can be made for this sort of circumstance through powers of attorney and guardianship.

- *Are any of you familiar with these terms?*

- Firstly, we will discuss the issue of power of attorney.

- A *Power of Attorney* is a legal document that allows another person (someone that you choose) to:
  - Look after your financial affairs or
  - Make personal decisions or
  - To consent to medical treatment on your behalf

During a period when you are unable to manage your own affairs either temporarily or permanently. It is easy to make and change a Power of Attorney.

SEE NEW SLIDE
The types of Power of Attorney are:

- General – This is for a fixed time period. A general power of attorney means that someone can make financial decisions on your behalf for a particular purpose (for example you might be out of the country). It is only valid while you have ‘legal capacity’.

SEE NEW SLIDE

- An "Enduring Power of Attorney" also allows another person the legal authority to make financial and legal decisions on your behalf. An Enduring Power of Attorney can only be made by a person whilst they are still capable of making those legal and financial decisions for themselves.

- An Enduring Power of Attorney must be signed while a person still has legal capacity. It will remain effective even though they may subsequently suffer loss of capacity due to disability or illness. Once capacity is lost through disability or illness, an Enduring Power of Attorney cannot be signed or revoked.

SEE NEW SLIDE

You need to choose very carefully the person(s) to whom you give power of attorney to protect your affairs. They are required to act in your best interests and wherever possible to make the same decision, you would have made.

NEXT

- Choose someone you know well and trust completely – and discuss your wishes with them in detail well in advance.

NEXT

- If the person(s) given power of attorney is not acting appropriately, or there is conflict over what action should be taken, the matter can be referred by the concerned party to the Guardianship and Administration Board.

SEE NEW SLIDE
Guardianship

· The other term you may have come across before is “Guardian”

· Guardians are appointed for adults who are unable to make their own decisions due to some form of disability.

· A Guardian may be appointed and given the legal power to make personal or lifestyle decisions about work, living arrangements and medical treatment.

· Contact the Office of the Public Advocate on 9278 7300 for more information.

7. Group Discussion

· Does anyone have questions or comments before we finish up for today?

8. Conclusion

· We’ve talked about a number of important issues today. Thank you for all participating.

· Next week is our final session and I look forward to seeing you all again then.
SESSION TEN:

REVIEW AND CLOSE
SESSION TEN: Review and Close

Objectives:

☐ Introduce Session

☐ Review Session One and Two

☐ Review Session Three

☐ Review Session Four

☐ Review Session Five

☐ Review Session Six

☐ Tea Break

☐ Review Session Seven

☐ Review Session Eight

☐ Review Session Nine

☐ Closing comments
  ☐ Reminder regarding post intervention testing
  ☐ Reminder regarding booster calls
Introduction

We have come to the end of our program and I hope that you have found the sessions interesting and enjoyable.

Here is a copy of today’s outline.

- This session will be spent recapping the information that has been presented with brief discussion regarding the main issues raised within each topic.

- Whilst I am going to spend only a brief amount of time going over each session, please feel free to add in comments, suggestions or raise questions as we go along.
1. Recap of Session One and Two

- You will recall that after our first session where we started to get to know each other, we moved on to talking about some of the issues that affect older adults.

- Let’s turn back and review the summary sheet for Session Two on Memory and Dementia. In this session we explored how memory changes and the difference between memory difficulties associated with normal ageing and more serious problems that might suggest the early signs of dementia.

- We watched a video presentation on Alzheimer’s disease which reviewed the symptoms of the disease.

- Let’s go over some of the facts regarding AD now.
  - Alzheimer’s disease accounts for roughly 2/3 of dementia cases in Australia
  - It is characterised by abnormal pathology in the brain
    - Loss of brain cells
    - Brain shrinkage
    - A build up of abnormal microscopic structures called “plaques” and “tangles” which are clumps and strands of proteins that accumulate outside and inside brain cells.
    - Poor communication of the brain cells to each other
  - The risk of developing AD increases if there is a 1st degree relative with the disease.
  - Age is also a risk factor, particularly being aged 80 and older.
  - In order to be diagnosed with AD an individual needs to:
    - Demonstrate impairment in memory abilities as well as in another aspect of thinking such as language or in planning and organisation.
    - There needs to be evidence of decline.
    - The difficulties need to be severe enough to cause difficulty in the ability to undertake aspects of daily functioning such as managing aspects of the household or driving.
    - There must be no evidence of a clouding of consciousness or acute confusion at the time of the diagnosis.
    - Other reversible causes of cognitive difficulties also need to be ruled out such as depression, medical problems.

2. Recap of Session Three

- Turning now to Session Three, we explored the benefits of physical activity and the Australian Government Physical Activity Guidelines recommending 30minutes of moderate intensity activity on most days of the week.

- We reviewed the potential benefits associated with being physically active which included reducing the risk of heart disease and high blood pressure, Falls and injuries, Obesity, Osteoporosis, Stroke and Depression.

- Being physically active was also associated with other benefits including increasing opportunities for socialisation and quality of life, improving sleep and reducing pain and stress.
Session Ten: Review and Close

· Have any of you begun to change your level of physical activity or become more mindful of the importance of physical activity?

· The other issue we touched on briefly in that session was nutrition. We watched a video that discussed important nutrition information relevant to older adults as well as reviewing ways for you to obtain more information about healthy eating. Have any of you looked at your eating habits more closely?

SEE NEW SLIDE

3. Recap of Session Four

· Moving on to Session Four. This Session was devoted to the issue of stress, the causes, effects and management.

· We know that stress can have negative effects of sleeping patterns, cause muscle tension, aches and pains, can influence mood state and can also lead to problems with attention and concentration.

· In our discussion regarding the management of stress, we talked about the benefits of relaxation. Have any of you continued with your breathing relaxation exercise?

· Let’s run through this exercise again now.

· I would like you to breathe in, hold your breath and count to five and then breath out and say the word ‘relax’ to yourself in a calm soothing manner. We are going to do this repeatedly. Let’s begin.

· Now I would like you to start breathing in through your nose and out slowly through your mouth. Breathing in for three seconds, then out for three seconds. This will produce a breathing rate of 10 breaths per minute. Let’s begin, we will do this for five minutes.

· Did any of you invest in a relaxation tape?

SEE NEW SLIDE

4. Recap of Session Five

· Depression was the topic of Session Five. Again we explored the causes, effects and management of this condition. In particular we reviewed how symptoms of depression may manifest as behavioural physical and thought changes.

· Depression is often managed with a combination of medications and counselling and lifestyle changes may also be implemented.

· The handout from Beyond Blue thoroughly covers the issues of depression in older adults and is a useful resource.

SEE NEW SLIDE
5. Recap of Session Six
   · A common issue affecting older adults are sleep changes, and this was topic of session six.
   · Changes features of our sleeping habits occur naturally and normally with age, however there are a number of ways to manage sleep difficulties. These include the use of medication, lifestyle changes and monitoring of sleep patterns to identify potential causes.
   · Did anyone need to draw on this information to assist themselves, a friend or family member with sleep disturbance?
   · Let’s have a tea break.

6. Tea Break

7. Recap of Session Seven
   · The title of session seven was “Older but not Old” and we looked at some of the ways of challenging the negative stereotypes associated with becoming older.
   · We reviewed the issue of ageism in the workplace and also looked at older adults who have and are continuing to remain active and productive in the community well into what would be considered their “retirement years”.
   · The second half of that session was devoted to the issue of volunteering. We talked about the benefits to the community, economy and individual from engaging in this form of activity.
   · We also explored the different types of activities that people could volunteer for as well as ways of obtaining more information.
   · Have any of you thought more about ways you could volunteer within the community? Did the presentation inspire you to go out and explore the different types of things you might be able to get involved in?

8. Recap of Session Eight
   · In session eight we discussed an issue that affects all of us at some stage – retirement.
   · In our discussion we talked about the different implications that retirement might have, both positive and negative.
   · We also talked about ways to enjoy retirement and different activities such as returning to study, travel and the health benefits of having a pet.
9. Recap of Session Nine

- As we get older, we may feel more vulnerable in our homes, particularly if living alone, and when we are out in the community. I hope you found the safety tips we discussed in this session were helpful and alerted you to some of the simple practices that can be put in place to ensure your personal security.

- We talked about fire safety and home security, as well as ways of enhancing your safety in the home and out in the street. I suggested that you contact your local fire department and/or police station for more detailed tips.

- The other matter we discussed was ensuring that important medical information is available to others, if there came a time when you had a medical emergency. This would greatly assist those involved in your care.

- In the latter half of this session, we also talked about planning for the future in terms of making a Will and the issues of power of attorney. The Office of the Public Trustee can further assist in dealing with questions relating to these issues.

SEE NEW SLIDE

10. Closing statements

- Well, now that we have come to the end of our 10-week program I would like to thank you all for participating. I hope you have found it enjoyable and have learnt and found out about ideas and issues that you had never really considered in depth.

- You will all be encouraged to attend for your follow-up testing so that we can look to see whether there has been any change in your cognitive performance over the course of our program.

- You will all be contacted in six months time so that we can see how you have progressed. This will also be an opportunity for you to discuss any concerns or questions you might have regarding the information we have learnt.

- In twelve months time we will contact you to visit us again so that we can complete the testing process and finalise your involvement in the study.

- Does anyone have any questions?

- I’d like to present you all with your certificates of participation in the course. A final certificate will be issued upon your twelve-month review.

- Please join me in congratulating each of you individually as you receive your certificates.

- Mr. X…thank you; Mrs. Z…thank you…..etc.
Appendix E: Education Group Participant Manual
Promoting Healthy Ageing with Cognitive Exercise

The P.A.C.E Study

EDUCATION PROGRAM HANDBOOK
Promoting Healthy Ageing with Cognitive Exercise (PACE)

The PACE study is a collaborative project between Royal Perth Hospital, the University of Western Australia and the Centre of Excellence for Alzheimer’s Disease Research and Care.

PACE TEAM

Project Co-ordinator  Ms. Mandy Vidovich
Investigators  Professor Osvaldo Almeida
Professor Nicola Lautenschlager
Professor Leon Flicker
Project Assistant  Ms. Josephine Shaw

PACE STUDY CONTACT DETAILS

You can contact the PACE team on:

Telephone:  9224 2855
Fax:  9224 8009
Address:  WA Centre for Health and Ageing
University of Western Australia
Royal Perth Hospital
Level 6 Ainslie House
48 Murray Street
Perth WA 6000
Promoting Healthy Ageing with Cognitive Exercise (PACE)

This Folder Belongs To:

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If Found Please Contact:

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INTRODUCTION

Welcome to the Promoting Healthy Ageing with Cognitive Exercise (PACE) study. Without your participation this valuable research would not be possible and we thank you, and hope that you find the study interesting and enjoyable.

You will recall that this study has a number of components. This component is made up of ten sessions, aimed to provide you with information and education regarding a range of issues relevant to older adults (including memory problems, depression, health and retirement).

You will be invited to attend a 90-minute session, twice a week, for five consecutive weeks. Each session will be held in a conference room with no more than ten people in a group. The conference room is on:

Level 6
Ainslie House
48 Murray Street
Perth

The days and times you will need to attend each week are:

MONDAY TIME: _____________________

THURSDAY TIME: _____________________
Promoting Healthy Ageing with Cognitive Exercise (PACE)

**CALENDAR 2008**

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PARTICIPATION PLEDGE

Respect each other, including thoughts and opinions even if you disagree

Express your thoughts, but don’t shout or enforce them

Sensitivity to the views and beliefs of others is foremost

Participate and share work equally

Encourage and foster development; do not criticise or chastise

Create a comfortable learning environment for each other; be aware of personal space and privacy

Try to have fun!
OVERVIEW OF PROGRAM

Session 1: Introduction
Session 2: Memory and Dementia
Session 3: Physical Activity and Nutrition
Session 4: Stress: Causes, Effects and Management
Session 5: Depression: Causes, Effects and Management
Session 6: Sleep Changes in Older Adults
Session 7: Older but not “Old” - Challenging the Negative Stereotypes
Session 8: Enjoying Retirement
Session 9: Older, Wiser and Safer
Session 10: Review and Closing
SESSION ONE: Introduction
SESSION ONE: Introduction

Session Outline:

☆ Welcome
☆ Study Description
☆ Introductions
    ☆ Group Members
        First Names:  
        ____________
        ____________
        ____________
        ____________
        ____________
        ____________
        ____________
    ☆ Tea Break
☆ Video Presentation “Ageing – The Human Condition”
☆ Group Discussion
☆ End of Session
SESSION TWO:

Memory and Dementia
SESSION TWO: Memory and Dementia

Session Outline:

☆ Topic Introduction

☆ The Ageing Brain
   ☆ Ageing effects on cognition

☆ Differentiating Between Age Associated Memory Problems and Dementia

☆ Defining Dementia
   ☆ Terminology
   ☆ Age as a risk factor
   ☆ Early signs and symptoms

☆ Tea Break

☆ Video Presentation “Memory Matters”

☆ Group Discussion

☆ Defining Alzheimer’s Disease
   ☆ The Facts
   ☆ Diagnosis

☆ Session Close
SESSION TWO: Memory and Dementia

☆ Introduction

- We rely heavily on our memory to do everyday things. A reliable memory is a valuable asset.
- Without memory, everyday activities that can be sometimes taken for granted, such as remembering how to prepare breakfast, would be extremely difficult to perform.
- Think of all the faces of family members and friends you remember and all the words you know the meanings of.
- Some aspects of memory tend to decline with increasing age and this may have some impact on the way we function.
- Whilst memory for past events and for the meanings of words, remains relatively stable, we may begin to find it harder to remember information of a more short term nature.
The Ageing Brain

- It is widely accepted that ageing causes changes to the structural and functional make-up of the brain.
- Whilst some areas of the brain are affected more than others, for some people, the brain becomes less efficient in processing information.
- When compared to younger persons, older adults tend to have greater difficulty with aspects of attention and concentration. They may experience greater difficulty:
  - Trying to selectively attend to information; having trouble trying to ignore irrelevant information.
  - Multi-tasking, or trying to do two or more things.
  - Sustaining concentration.
- Another consequence of ageing is that cognitive slowing occurs. Essentially this means that there is a tendency for the speed of mental operations to slow down as we age.
- These difficulties in attention and concentration, and the slowing of thought processes are considered to be contributing factors as to why older adults often experience everyday problems with their memory.
Differentiating between memory problems and dementia

- Everyone forgets things from time to time, however for people with dementia, the memory problems are persistent and progressive, not just occasional.

- Memory change associated with healthy ageing doesn't interfere with everyday life in any dramatic way. However the memory difficulties experienced by someone with dementia significantly influence their ability to carry out aspects of their daily functioning.
Defining dementia

The term ‘dementia’ is derived from the Latin ‘de mens’, meaning, ‘without mind’ and is used to describe the symptoms of a large group of illnesses which cause a gradual decline in mental functioning (eg. memory, planning and problem solving) and social skills.

It is generally a progressive condition whereby the individual may start off experiencing mild difficulties or noticing subtle changes, to the point where they may no longer be able to look after themselves independently and demonstrate behaviours uncharacteristic of their former selves.

There are a variety of causes of dementia. The most common cause of dementia is Alzheimer’s disease.

Dementia is not a normal part of ageing. Whilst dementia can happen to anybody, it is more common after the age of 65 years. One in four people aged over 85 years have some form of dementia. In this sense, age is the main risk factor for dementia.

Early signs and symptoms of dementia might include:
- Difficulty recalling recent events
- Having trouble making decisions or demonstrating poor judgment
- Difficulty managing routine chores or having trouble handling complex tasks like balancing a cheque book
- Difficulty understanding or following a story or conversation
- Behaviour and personality changes
∗ Alzheimer’s Disease – Some Facts

- Alzheimer’s disease accounts for roughly 2/3 of dementia cases in Australia.
- It is characterised by abnormal pathology in the brain.
- The risk of developing Alzheimer’s disease increases if there is a 1st degree relative with the disease.
- Age is also a risk factor, particularly being aged 80 and older.
- In order to be diagnosed with Alzheimer’s disease an individual needs to:
  - Demonstrate impairment in memory abilities as well as in another aspect of thinking such as language or in planning and organisation.
  - There needs to be evidence of decline.
  - The difficulties need to be severe enough to cause difficulty in the ability to undertake aspects of daily functioning such as managing aspects of the household or driving.
  - There must be no evidence of a clouding of consciousness or acute confusion at the time of the diagnosis.
  - Other reversible causes of cognitive difficulties also need to be ruled out such as depression or medical problems.
- The value and benefit of dementia medications is limited. At present, these medications can be helpful, but are not curative. They can not cure the disease.
SESSION THREE:

Physical Activity and Nutrition
SESSION THREE: Physical Activity and Nutrition

Session Outline:

☆ Topic Introduction

☆ Taking the First Steps to Beginning an Exercise Regime
  ☆ Guidelines for physical activity

☆ Video Presentation “Maximising Physical Potential for Older Adults”

☆ Getting Moving
  ☆ The benefits of physical activity

☆ Getting Started
  ☆ Ideas to motivate physical activity

☆ Tea Break

☆ Introduction to Nutrition

☆ Video Presentation “Eat Well For Life”

☆ Useful Contacts

☆ Session Close
Introduction to Physical Activity

- Traditional views of ageing and physical activity centred on the ideas that older adults should conserve energy and avoid potentially vigorous activity.

- Ancient philosophers believed that human longevity was determined by how quickly one used up their vital spirits. Accordingly, a long and healthy life was considered to result from inactivity and conserving one’s resources.

- In more recent years, this conservative way of thinking has been reversed and we now understand the many virtues associated with being physically active.
Taking the First Steps to Beginning an Exercise Regime

- Being active in lots of different ways throughout the day can provide opportunity for improved health and well being.

- According to the Australian Government Physical Activity Guidelines, everyone should try to do at least 30 minutes of moderate intensity physical activity on most days of the week. This however doesn’t need to be thirty minutes of continual exercise.
 SESSION THREE: Physical Activity and Nutrition

☆ Get Moving!

- It’s never too late to become physically active.

- Physical activity can help prevent illness and disability and influence our ability to remain independent within the community.

- Inactive individuals are more prone to declines in bone and muscle strength, have reduced heart and lung fitness and less flexibility.

- By being active, a person can reduce the risk of
  - Heart disease and high blood pressure
  - Falls and injuries
  - Obesity
  - Type II (late onset) diabetes
  - Osteoporosis
  - Stroke
  - Depression

- Other benefits of physical activity include:
  - Increased opportunity to meet new people and be socially active.
  - Improved quality of life including having more energy and improving mental health, self esteem and confidence.
  - Reducing physical pain due to improved posture, balance, and muscle and bone strength.
  - Relaxation, stress reduction and improved sleep.
SESSION THREE: Physical Activity and Nutrition

🌟 Getting Started

- Always consult a doctor if you have any concerns regarding your ability to engage in exercise.
- Whilst you might feel too tired to start, you’ll soon notice that physical activity will help you feel better and give you more energy. Don’t let excuses be barriers to starting your own routine.
- Set yourself some goals, start slowly and increase the amount of activity you do gradually.
- It’s best to start with activities you know you will enjoy and then try something new once you feel ready for a little more of a challenge.
- Remember, try to incorporate activities into your daily routine and if you find it hard to get motivated, try joining a club, or even ask your neighbour to join you in a regular morning walk.
- Try to be active every day if you can, particularly if wanting to lose weight is an issue for you.
Nutrition

• Australians are living longer and in order to maintain health into these extra years, good nutrition is very important.

• Neglecting proper nutrition is one of the most common health problems in older adults. Eating too many high-fat foods and not exercising is a combination that can lead to diabetes and heart disease.

• Malnutrition increases the risk for contracting a number of medical conditions making it important not to neglect your diet.

• “Eat Well for Life” is a Commonwealth Government Publication that will be available in the New Year. Contact the Department of Health on 1300 135 030.

• Nutrition Australia is a non-profit, non-government national community nutrition education organisation. They produce a number of publications available for older adults. They also run cooking and nutrition classes teaching about cooking for one. For further information contact Ms. Stephanie McFaull on 6304 5714.

• Ask your general practitioner for a referral to a dietician in your local area.
SESSION FOUR:

Stress: Causes, Effects and Management
SESSION FOUR: Stress: Causes, Effects and Management

Session Outline:

★ Topic Introduction

★ Stress and Retirement
  ★ Causes of stress

★ Negative Effects of Stress
  ★ Sleep difficulties
  ★ Physical changes
  ★ Mood issues
  ★ Cognitive problems

★ Managing Stress
  ★ Changing personal beliefs and thought processes
  ★ Techniques and strategies

★ Tea Break

★ Anxiety

★ Relaxation Exercise Demonstration

★ Session Close
Introduction

- The term “stress” can have a number of meanings.
- For our purposes, stress:
  - Is a mentally or emotionally disruptive or upsetting condition
  - Occurs in response to adverse influences
  - Is capable of affecting physical health
  - Is difficulty that causes worry or emotional tension
☆ Stress and Retirement

· Stress and retirement are often not recognised as two possible co-occurring entities.

· Retirement itself is thought of as a time of opportunity for holidays, recreational activities, relaxing and taking things easy.

· It is not uncommon however, in the context of everyday life challenges, for older adults to experience stress at some point in time.

· Stress can be physical or social and caused by a sudden situation or be ongoing and part of day to day life.

· Stress can be the product of any number of concerns including:

  · Financial problems and social status
  · Family problems (eg. being the primary carer for a loved one)
  · Health and disability problems (eg. arthritis, chronic pain)
  · Housing problems
  · Loss and grief (eg. death of a spouse; loss of vision or hearing)
  · Boredom
Negative Effects of Stress

- Long-term stress can have negative effects on a number of different aspects of health. The effects can be physical and mental.

- Stress can cause:
  - Sleeping difficulties – an individual might start to have trouble falling off to sleep; find they are laying awake ruminating about things; or wake during the night and have trouble resuming sleep.
  - Muscle tension, which can lead to feeling sore and aches and pains.
  - Changes in blood pressure and can contribute to heart disease.
  - Mood changes (eg. irritability, anxiety, nervousness, emotionality).
  - Changes in thinking abilities – poor concentration, difficulty with memory, trouble finding words in conversation, reduced ability to plan and organise.
☆ Managing Stress

- There are many different ways to try to manage stress and what works best will depend on the individual.

- A positive belief in the ability to cope and manage with stress will go a long way in handling the situation and to reduce the potentially negative impact that stress can have.

- Feelings of self-confidence and personal control can make a significant difference in lessening the negative effects of stress, in maintaining quality of life and in the ability to make sensible decisions.

- Some techniques for dealing with stress include:
  
  - Adopting sensible coping strategies
  - Regular exercise
  - Reducing/Ceasing smoking; moderating alcohol consumption and eating a healthy diet.
  - Hobbies; A good social life
  - Learning Tai Chi or Yoga
  - Massages, hot baths or spas

- Other types of relaxation techniques include
  
  - Meditation and deep breathing
  - Listening to music or other relaxation tapes
  - Self-hypnosis
  - Counselling, therapy or support groups
Anxiety

- Worry can be a normal reaction to a situation, such as illness or financial problems, and we all might feel anxious at times in certain situations.

- Anxiety disorders are disorders that involve unrealistic or excessive worry about multiple areas of life. They can become more common as we age, as there can be a tendency for medical, psychological and social problems to build up.

- Individuals who suffer persistent or extreme anxiety have a reduced quality of life.

- Symptoms of anxiety include:
  - Tense muscles, leading to shaking, trembling and restlessness.
  - Shortness of breath, rapid heart rate, sweating, dry mouth, dizziness, nausea, diarrhoea, flushes or chills, frequent urination.
  - Being overly watchful or alert, easily startled, trouble concentrating, irritability and sleep disturbance.
  - Changes in behaviour or normal routines that are used to reduce anxiety (eg. avoidance, withdrawal, and repetitive checking behaviours).

- Anxiety can be associated with depression, dementia, side effects of medications, medical disorders, neurological conditions or dietary problems.

- Diagnosis usually involves attendance to a general practitioner and possibly referral for tests and review by other specialists such as a Psychologist or Psychiatrist.

- A combination of psychological therapy and medication may be necessary to effectively treat the anxiety disorder.
SESSION FIVE:

Depression: Causes, Effects and Management
SESSION FIVE: Depression: Causes, Effects and Management

Session Outline:

☆ Topic Introduction

☆ Video Presentation - “Understanding Depression in Your Senior Years”

☆ The Facts About Depression

☆ Recognising Symptoms of Depression
  ☆ Behavioural
  ☆ Mood
  ☆ Physical

☆ Tea Break

☆ Treatments for Depression
  ☆ Medication
  ☆ Counselling

☆ Recognising Risk Factors for Depression and Seeking Help

☆ Session Close
SESSION FIVE: Depression: Causes, Effects and Management

☆ Introduction

· Depression is a clinical disorder characterized by an inability to concentrate, changes to sleeping patterns, loss of appetite, inability to find pleasure in activities, feelings of extreme sadness, guilt, helplessness and hopelessness.

· Depression can affect anyone at any age.
The Facts About Depression

- Symptoms of depression are common in older adults.
- Depression is not part of normal aging.
- It is not simply a sad mood or phase that will pass.
- Depression has many possible causes, however sometimes no cause can be identified.
- It can run in families.
- Depression can be difficult to detect in older adults because physical and health problems can mask depressive symptoms.
- A person is at greater risk if they have suffered depression earlier in life.
- Depression can damage a person’s quality of life and their relationships with friends and family.
- Severe depression has been associated with increased risk of other diseases and greater mortality.
- Severe depression can be associated with suicidal thoughts and suicide. There is an increased risk of suicide with older age and as many as 75% of older adults who commit suicide are suffering from depression.
SESSION FIVE: Depression: Causes, Effects and Management

Recognising Symptoms of Depression

- Older adults often do not recognise or report symptoms of depression. Sometimes a family member or friend will recognise changes in behaviour before the person with depression does.

- A General Practitioner may also routinely ask about aspects of mood, personality and current thinking patterns.

- Symptoms of depression may be reflected in changes to behaviour, thought pattern/mood and physical functioning.

  - Changes in behaviour include:
    - Reducing the level of activity normally engaged in and withdrawing from people
    - Neglecting to look after oneself (e.g., decline in personal grooming)
    - No longer enjoying previously fun activities
    - Changes in appetite and weight (gain/loss)
    - Restlessness/agitation

  - Physical symptoms include:
    - Alterations in sleep patterns (e.g., sleeping more; trouble falling asleep; early wakening)
    - A lack of energy or feeling very tired
    - Slowing of movements

  - Thought pattern/mood differences:
    - Feeling sad, irritable and/or anxious
    - Feelings of worthlessness, helplessness, emptiness, guilt or burden
    - Recurrent thoughts about death and suicide
    - Problems with concentration and memory
Treatments for Depression

- Depression is a treatable illness. Early detection and treatment may help to keep depression from becoming severe.

- There are many treatments available for depression. The two main treatments are medication and counselling and a combination of the two may be best, particularly if the depression is severe.

- Some people will need to take medications for the rest of their lives, but many people can be stabilised after which time the medication may be stopped.

- There are new antidepressants that have fewer side effects and that usually work well for older adults.

- Some drugs with specific side effects may be chosen (eg. a drug with a sedative action if there is insomnia).

- Usually it can take time before the benefits of antidepressants are recognised (sometimes up to six weeks). Treatment usually begins with a low dose, which is increased slowly and carefully.

- Psychological treatments for depression can focus on changing negative thought patterns, recognising situations that might trigger feelings that lead to depressive thoughts and improving relationships.

- Lifestyle changes may also be needed to assist with the treatment of depression, including diet and nutrition, exercise and social activities.
Recognising Risk Factors for Depression and Seeking Help

- Some risk factors may trigger depression. However, not all depression can be traced to a risk or cause.

- Risk factors for depression in older people may include:
  - Isolation
  - Living in a nursing home or other care facility
  - Dementia
  - Other physical health conditions.

- There are a number of different sources for help or advice on mood symptoms. These include:
  - A general practitioner
  - A psychologist or psychiatrist
  - Help lines
  - Hospital
SESSION SIX:

Sleep Changes in the Older Adult
SESSION SIX: Sleep Changes in the Older Adult

Session Outline:

☆ Topic Introduction
  ☆ Brief Video Presentation

☆ The Importance of Sleep

☆ The Sleep Cycle

☆ Defining Sleep Problems
  ☆ Recognising a sleep disturbance

☆ Tea Break

☆ Improving Sleep – Using Medication

☆ Improving Sleep – Lifestyle Changes

☆ Session Close
Topic Introduction

- More often than not, problems of disturbed sleep tend to be:
  - Short lived
  - Resolve spontaneously and
  - Do not significantly impact on the person’s quality of life.

- Some people will however find that they experience more persisting and troublesome sleep disturbance that interferes with their daily functioning.

- A recent study conducted in Western Australia found that over 60% of older adults in contact with their general practitioner complain of poor sleep.
The Importance of Sleep

- We need sleep to assist with memory and learning – Sleep seems to play a role in memory, by organising memories and solidifying learning in the brain. Poor sleep can impair concentration, memory and the ability to learn.

- Individuals who are sleep deprived may also experience difficulty making decisions, poor judgement and an increase in risk taking. This has implications for work performance, daily functioning and driving.

- Sleep also influences mood enhancement and social behaviours, with anxiety, depression and other emotional problems being associated with a chronic lack of sleep. Tired people are often cranky and more easily frustrated.

- Sleep is also important for the immune system and general health – immunity is weakened without adequate sleep, making the body more vulnerable to infection and diseases.
SESSION SIX: Sleep Changes in the Older Adult

★ Recognising a Sleep Disturbance

- Changing features of sleeping habits occur naturally and normally with ageing. Commonly, older adults may sleep less hours during the night and many will wake up once or twice (quite often to use the toilet).

- Phases of Sleep

  · **Stage 1 (Drowsiness)** – This is the first stage, of falling asleep and it lasts for five or ten minutes. Your eyes will move slowly under the eyelids, and muscle activity slows down. You then start to move into…

  · **Stage 2 (Light Sleep)** – Your eye movements stop, your heart rate slows, and your body temperature decreases.

  · **Stages 3 & 4 (Deep Sleep)** - During these next stages, 3 and 4, you are difficult to awaken. People who are woken up during Deep Sleep do not adjust immediately and often feel groggy and disoriented for several minutes after they wake up.

  · **REM sleep** - At about 70 to 90 minutes into your sleep cycle, you enter another phase of sleep called Rapid Eye Movement or REM sleep. You usually have three to five REM episodes per night and during this phase, your eyes jerk rapidly in various directions under your eyelids.

- The first sleep cycles each night contain relatively short REM periods and long periods of deep sleep. As the night progresses, REM sleep periods increase in length while deep sleep decreases. By morning, people spend nearly all their sleep time in stages 1, 2, and REM.

- As we get older, there is a steady decline in the amount of deep sleep, and increase in the amount of time spent in stages one and two, with little change in REM.
SESSION SIX: Sleep Changes in the Older Adult

☆ Recognising a Sleep Disturbance (continued)

· Sleeping behaviours that may suggest a problem include:
  · Trouble falling asleep
  · Waking in the middle of the night and being unable to fall back to sleep.
  · Feeling tired and unrefreshed in the morning and throughout the day.
  · Excessive daytime sleepiness.
  · Excessive snoring and intermittent breathing problems at night.
  · Restlessness when you sleep.
Recognising a Sleep Disturbance (continued)

- Intrusive factors that can influence sleep include:
  - Changes in routine or changes in environment.
  - Psychological/Emotional issues such as stress, depression and anxiety.
  - Medications including prescription medications and over the counter products (e.g., cardiovascular medications, corticosteroids, antidepressants, diuretics and decongestants).
  - Pain and Illness including arthritis, osteoporosis, heart disease and lung disease.
  - Sleep apnoea - This occurs when the airway from the mouth to the lung collapses during sleep. An individual may have hundreds of these episodes throughout the night, which disrupt sleep and starve the body of oxygen.
  - Periodic limb movement disorder - Individuals with this condition suffer from involuntary leg movements during sleep that occur every 10 to 60 seconds and for periods lasting anywhere from a few minutes to several hours. These movements can wake people, disturb their sleep and awaken bed partners.
  - Smoking, Alcohol, Tea/Coffee/Cola - Caffeine and nicotine are stimulants and will make it harder to fall asleep. Some people will consume alcohol to promote sleep. However when alcohol is consumed within an hour of bedtime it disrupts sleep patterns, causing awakening and difficulty resuming sleep.
☆ Improving Sleep – Using Medication

- Whilst some prescription medications may be helpful in situations of insomnia, they are also associated with a number of side effects.

- The mostly frequently prescribed medications for sleep in Australia are a group of drugs known as ‘benzodiazepines’.
  - This class of drugs can have negative effects on sleeping patterns, causing the individual to wake more frequently during the night and having less deep sleep.
  - This class of drugs also produce ‘tolerance’ and prolonged use can lead to ‘dependence’.
  - If someone is dependent on sleeping tablets then abruptly stopping these may lead to withdrawal symptoms such as irritability, sweating, nausea, dizziness, insomnia, anxiety, headaches and tremor. However these symptoms will usually subside after 2-5 days.

- Other side effects of sleeping tablets include:
  - Drowsiness during the day
  - Slower reaction time
  - Impaired judgement, memory and concentration
  - Problems with co-ordination
  - Anger, irritability and mood swings
  - Feeling panicky
  - Incontinence
  - Increased risk of falls and fractures

- The best clinical evidence currently available suggests that sleeping tablets should not be used regularly and certainly not for prolonged periods of time (three months or more). If you are concerned regarding any medication you might be taking, consult your general practitioner. **Do not** cease taking medications without talking to your general practitioner.
SESSION SIX: Sleep Changes in the Older Adult

★ Improving Sleep – Lifestyle Changes

- There are a number of lifestyle changes that can assist in improving sleep. These include:
  - Adopting a regular sleep-wake schedule
  - Altering the sleep environment
  - Winding down before going to bed
  - Using the bedroom only for sleep related activity
  - Avoiding worrying in bed
  - Being mindful of the effects of alcohol, smoking and caffeine
  - Avoiding excessive eating at night
  - Engaging in regular physical activity
  - Learning and practicing relaxation techniques
Improving Sleep – Lifestyle Changes (continued)

- Keeping a diary of sleep patterns and activities that might be affecting sleep is also useful.
- Sleep diaries should be completed over one week. Each evening records are made of the times during the day when:
  - Meals are eaten
  - Tea, coffee, cocoa, cola drinks, alcohol is consumed
  - Naps are taken
- In the morning record
  - The time woken up (with or without an alarm)
  - The time out of bed
  - How long it took to fall asleep
  - The amount of time asleep and any time awake at night (don’t watch the clock at night though!)

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<th>Activity</th>
<th>Sleep Patterns</th>
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<td>Ate dinner; glass of red wine</td>
<td></td>
</tr>
<tr>
<td>7pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9pm</td>
<td>Cup of tea; biscuit</td>
<td></td>
</tr>
<tr>
<td>10pm</td>
<td></td>
<td>Bed -10.30 asleep</td>
</tr>
<tr>
<td>11pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12am</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1am</td>
<td></td>
<td>Woken up by noise outside</td>
</tr>
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</table>
SESSION SEVEN:

Older but not “Old”:

Challenging the Negative Stereotypes
SESSION SEVEN:

Older but not “Old” - Challenging the Negative Stereotypes

Session Outline:

☆ Part One: What it means to be an older adult in society
☆ What is the meaning of “Old Age”
☆ Video Presentation
☆ Challenging cognitive perceptions of the older adult

☆ Part Two: Volunteering - Continuing to be valuable, contributing members of society
☆ Who Benefits from Volunteering?
☆ Tea Break
☆ Part Two Continued
☆ What Sorts of Things do Volunteers do?
☆ Is Volunteering For Me?
☆ Obtaining More Information About Volunteering
☆ Session Close
What is the meaning of “Old Age”

- Everybody ages; this is a universal phenomenon, however the concept of “old age” is not only a biological process, but is also strongly defined by social and cultural norms.

- In Western society, the concept of age and life course is determined by various stages/events such as starting school, entering the work force and retirement. It is the point of retirement, around the age of 65, which is perceived by Western Society as “old age”.

- In today’s modern society emphasis is often placed on keeping up to date with the latest technological innovations, computers and the Internet, with increased cultural importance placed on cognition and the preservation of sharp mental abilities.

- As such, Western society tends to hold more negative stereotypes of ageing, with expectations of older adults having poorer cognitive abilities and being less productive in their contribution to society post the age of retirement.
SESSION SEVEN:
Older but not “Old” - Challenging the Negative Stereotypes

☆ Volunteering

- A volunteer is someone who chooses to use their skills and time, for free, to help out in the community and not-for-profit organisations.
- Volunteers are considered valuable, contributing members of the community, who use their skills and interests to benefit others.
- The range of available volunteer activities is wide and can involve fundraising, teaching, or simply regularly helping out people in the neighbourhood.
- Viewing the statistics on volunteering, as compiled by the Department for Community Development, reveals that in WA alone in the year 2000:
  - A third of our population engaged in some form of volunteer activity.
  - The amount of hours contributed by volunteers in WA is over 70 million a year.
  - This equates to some 800 million dollars (based on a minimum wage of $11.00 per hour).
Who Benefits From Volunteering?

- Everyone benefits from volunteering
  - The individual
  - The community
  - The economy

- People who volunteer report experiencing increased feelings of self confidence, self worth, belonging and fulfilment.

- Volunteering provides an opportunity to -
  - Develop knowledge and skill
  - Become involved and participate in the local community
  - Make a difference in someone else’s life, by sharing experiences and helping others
  - Stay active, socialise and make new friends

- Volunteering contributes to the health and well being of the community by increasing social cohesiveness and strengthening the community spirit.

- According to the Department for Community and Development, 1/5 of the volunteers in WA in the year 2000 were people over the age of 55, with “personal satisfaction” being the main reason for volunteering.
SESSION SEVEN:
Older but not “Old” - Challenging the Negative Stereotypes

☆ What Sorts of Things do Volunteers do?

- When one thinks of volunteer activities, most people consider charity fundraising, meal deliveries and volunteer driving. Other examples include:
  - Tree planting
  - Teaching/tutoring
  - Committee work
  - Clerical positions
  - Coaching/Refereeing
  - Befriending/Supportive counselling
  - Gardening
  - Performing/media production

- There are many other ways of volunteering which can be of enormous benefit to the community. These include:
  - Working with people with disabilities
  - Tutoring culturally and linguistically diverse people
  - Offering to help with volunteer State Emergency Service activities
  - School Volunteer Programs

- Volunteering doesn’t need to take up a lot of time. It could be performed as locally as the neighbourhood. For example:
  - Joining Neighbourhood Watch
  - Offering to help a frail neighbour with gardening, shopping or other support around their home
  - Helping out at the local primary school or kindergarten with fundraising, reading assistance or a sports carnival.
SESSION SEVEN:
Older but not “Old” - Challenging the Negative Stereotypes

★ Is Volunteering for Me?

- Firstly think about how many hours each week you spend on other lifestyle activities. How much free time do you have to devote to volunteering?

- Next, consider if you would like the opportunity to:
  - Give something back to the community
  - Work for social change
  - Have fun
  - Learn new skills
  - Meet new people
  - Help others
  - Gain experience

- Volunteers are of every age, every culture and every level of ability.
SESSION SEVEN:

Older but not “Old” - Challenging the Negative Stereotypes

☆ Obtaining More Information About Volunteering

· Volunteering Western Australia is a membership based organisation.

· The aims of this organisation are to link volunteers with community based, not for profit, agencies.

· Volunteering Western Australia provides a free information session for people who are considering volunteering for the first time, or those who are already volunteers, though are interested in exploring alternative volunteer experiences.

· Information sessions provided by Volunteering WA explore:
  - The benefits gained by becoming a volunteer
  - The different volunteering opportunities available
  - The types of skills a person might have to offer as a volunteer
  - The rights and responsibilities of volunteers and the agencies one might work for or represent
  - Finding the right position for people wishing to volunteer

· The sessions usually last for an hour and are held at:

  Volunteering WA
  City West Lotteries House
  2 Delhi Street
  West Perth
  Ph: 9482 4333

  Joondalup contact details: 9400 4734

  www.volunteer.org.au
  www.govolunteer.com.au

  Fremantle Volunteer Service
  245 South Terrace
  South Fremantle
  Ph: 9335 3394
SESSION EIGHT:

Enjoying Retirement
SESSION EIGHT: Enjoying Retirement

Session Outline:

☆ Topic Introduction
☆ Retirement – Different Strokes for Different Folks
☆ Retirement – Variety is the Spice of Life
☆ Continuing Education
☆ Tea Break
☆ Travelling? Forgotten Something?
☆ Travelling? Making the Most of Your Trip
☆ Still Feel Like Something is Missing? Pet’s – A Healthy Alternative
☆ Session Close
Introduction

- Retirement may be defined as “Withdrawal from one’s occupation, position or office”. However, it has different meanings for different people.
Retirement – Different Strokes for Different Folks

· One of the most dramatic changes we go through in life involves retirement.

· Retirement has implications for identity in terms of work, relationships and social roles and economic and social status. It tends to mean different things for each individual and can be associated with both positive and negative emotions.

· Some view retirement as an opportunity to “smell the roses”. For others retirement provides time to undertake new and different activities that there was never time for when they were in paid employment.

· The idea of being able to catch up on hobbies, take up new activities or enjoy newfound time with family and friends may have brought excitement and pleasure. However some might find it difficult to remain interested and occupied and spending time on hobbies and interests, may not turn out to be as rewarding and meaningful as anticipated.

· Older adults may add the role of grandparent, which brings both new rewards and new demands. Grandparents may find they are expected to baby-sit more often than they would prefer.

· Retirement may also impact on partner/spousal relationships. Spouses may find themselves spending much more time together than they ever did before and there may be differing ideas on retirement lifestyle. This may cause stress and relationship conflicts.

· Some individuals may have been looking forward to becoming more socially and physically active only to have become confronted by limitations associated with illness or physical disability, either personally or due to someone else in the family.
Retirement – Variety is the Spice of Life

- People who plan an active life tend to be happier than those who have no plans or routines. Daily routine and activities add purpose to life.

- However it is important to try to strike up a balance.
  
  - If there is nothing in particular to do or look forward to on any given day, a person is more likely to feel bored and depressed than a person who lives an active meaningful life.
  
  - Taking on too many activities may place the person under undue pressure to accomplish things in unmanageable time frames. This may lead to stress and anxiety.

- There are a number of different activities that can be explored during retirement. These include:

  - Volunteering
  
  - Physical activity
  
  - New hobbies
☆ Continuing Education

• There are also plenty of opportunities for further study including:
  • Learning a language
  • Studying literature, history, environmental issues or science
  • Taking acting classes

• Learning can take place on-line, in classes or in the home.

• The University of the Third Age (U3A) at the University of Western Australia provides learning opportunities for people in their retirement years, living in the Perth Metropolitan area; in an informal and unstructured environment.

  • U3A is open to anyone over the age of 50 and offers opportunities to interact through learning and teaching.

  • There are no entry qualifications, no examinations and no diplomas. People can be both a student and a course leader.

  • U3A is a voluntary organisation and its success depends on the willing participation of members at all levels (e.g. running a course, helping with the administration of the organisation, as an occasional speaker to groups or simply by taking part in what is offered).

  • It runs study groups, occasional workshops and seminars, lectures and from time to time educational outings.
Travelling? Forgotten Something?

- A popular activity in retirement is travelling.
- Before travelling there are a number of things to keep in mind:
  - When choosing a vacation destination
    - Consult with a travel agent for suggestions.
    - Research important factors such as climate, language and culture. Buy a guidebook and read it before beginning the trip.
  - Be mindful of health treatment options and medical issues.
  - Have a medical check-up.
  - Review medication regimes particularly if needing to take into consideration different time-zones when travelling.
  - Wear a bracelet or pendant containing medical details.
  - Be mindful of the effects of dietary changes and different eating habits.
Travelling? Making the Most of Your Trip

- Allow time to recover from jet lag.
- Don't draw up a jam-packed itinerary for each and every day of your holiday – arrange for plenty of rest breaks, particularly in hot weather.
- Try using Seniors cards.
- Thieves and pickpockets may consider older people as easy targets, so don’t:
  - Don’t travel around at night
  - Don’t wear expensive jewellery on obvious display. Purchase a belt and wallet which can be worn under clothes and against the skin to keep valuables (such as traveller’s cheques and credit cards) safe and out of obvious sight.
- Carry at all times the contact details of the Australian embassy and important medical numbers.
- It’s worthwhile recognising that each of the travelling hints can also be applied to aspects of everyday lifestyle, particularly when it comes to the management of personal health and safety.
Still Feel Like Something is Missing? Pets – A Healthy Alternative

- Some individuals might not be comfortable undertaking activities in the community, travelling or socialising, however it is important to recognise that loneliness can be a common source of depression.

- Whilst it is important to maintain and even increase social networks, some people find that owning a pet can fill a void in their lives.

- Scientific research has found that older adults who own pets tend to:
  - Have lower levels of stress and be less vulnerable to depression and suicide
  - Be better at coping with grief and loss
  - Be more active
  - Have increased feelings of personal security

- There are however a number of things to consider when choosing the ideal pet:
  - The level of care required
  - The available space
  - The costs associated with owning a pet
  - The affects of any allergies

- For those who have never had a pet before, consider volunteering to help with looking after a friend or family member’s pet whilst they are away. Helping out at an animal shelter might also provide satisfaction, without having all the responsibility.

- Do not get a pet for a friend or relative without discussing it. Be mindful of what would happen if he or she cannot care for it. In the same way, it is a good idea to discuss what might happen to pets if someone moves to a nursing home or another facility that will not allow pets.
SESSION NINE:

Older, Wiser and Safer
Session Outline:

- Topic Introduction
- Safety in the Home
  - Fire Safety Tips
  - Home Security
  - Personal Security
- Personal Safety in the Street
- Group Discussion
- Tea Break
- Making Provisions for Medical Emergencies
- Planning for the Future
  - Wills
- Planning for the Future
  - Power of Attorney and Guardianship
- Group Discussion
- Session Close
SESSION NINE: Older, Wiser and Safer

Topic Introduction

- Being mindful of a few basic home safety precautions can go a long way to ensuring safety, reducing the risk of injury and maintaining independence within the home.

- Each of the following tips should not be used as a substitute for professional advice and are general strategies only, applying to people of all ages.
SESSION NINE: Older, Wiser and Safer

Safety in the Home - Fire Safety Tips

- Be prepared for fire. Know exactly what to do and where to go if there is a fire. Plan escape routes. Know two ways out of every room where possible. Make sure all doors can be unlocked and all windows opened.

- Install smoke alarms and make sure they work by checking them regularly.

- Keep heaters way from everything – including you. Have them at least one metre away from objects.

- When cooking, wear tight fitting or rolled up sleeves and don’t reach across a hot burner. If a pot catches fire, cover it with a lid and turn off the burner. Never leave cooking unattended.

- If your clothing catches fire, lower yourself to the ground, cover your face with your hands and roll back and forth to put the flames out.

- Crawl low under smoke. Most fire victims die from smoke, not flames. Smoke always rises, so you must get down on the floor where the air is cleaner. Crawl on your hands and knees to safety.
S E S S I O N  N I N E :  O l d e r ,  W i s e r  a n d  S a f e r

S a f e t y  i n  t h e  H o m e  -  H o m e  S e c u r i t y

- Do not place spare keys outside or around the home. Leave them with a neighbour, relative or friend.

- Cut bushes and trees which obscure windows. Remove any bushes than can provide a hiding place for an intruder.

- Secure the household electricity supply meter box.

- Make sure the house number is easy to see from the street for easy viewing in emergencies.

- Leave lights on inside and out.

- Install a telephone in the bedroom.

- Identify and mark property and keep an inventory of all of valuable items – record serial numbers, makes, models, colour sizes etc.

- Invest in a good quality security door and deadlocks on main entrance/exit doors. If deadlocks require a key to open from the inside, leave the keys in the locks when at home.

- Install a peephole in the main front and rear doors.

- Get to know your neighbours and keep a look out for each other’s safety.
Always be careful whom you let in to your home. Open the door only to people you know and trust.

Check the credentials of service repair people or salespersons and do not let charity collectors in to the home. If uncertain about someone, ask for their identification and if they are from an organisation, telephone the company and check.

If someone comes to the door to ask for a drink, to use the toilet or telephone, do not open the door, direct them to the nearest public facilities or make the call for them. Under no circumstances should you let a stranger in to the home.

If someone is at the door and you are alone and worried, pretend there is someone else in the house…Call out “It’s ok, there is just a X at the front door…I won’t be a minute”.

If you hear a noise at night, turn on all of your lights. Ensure the outside of the home is well lit at night.

When speaking to unknown callers on the telephone, do not give the name, number, address or any details of who lives in the house.

If you arrive home and suspect there is an intruder inside, do not enter the house. Go to a neighbour’s house and call the police. Keep out of sight and a safe distance from the house. Make a note of the description of anyone you see leaving the house as well as of any vehicles and their registration numbers.

If at home and you notice an intruder on your property, activate a burglar alarm if you have one, go to the nearest phone and telephone the police, switch on lights and make a lot of noise, but do not confront the intruder. If the intruder confronts you, try to stay calm but shout and scream, particularly if you think this might alert your neighbours.
Personal Safety in the Street

- Carry your handbag in front of you close to your body. You might want to keep your money, cards and keys in a separate wallet or money belt or inside a jacket.

- Carry only the money you need and if carrying a bag, keep it with you at all times, do not leave it in a trolley or at your feet when seated in public places.

- Consider setting up electronic bill paying and banking facilities, to avoid having to carry large amounts of cash around.

- If confronted by someone trying to take your bag, give it to them. This may go against all instincts, but no amount of money or inconvenience is worth personal injury. Try to remain calm and take note of the appearance of the individual and the vehicle if one is involved. Call the police straight away.

- Do not walk close to the kerb and vary the route and times that you go shopping. Be observant and consider shopping with a friend or relative.

- If travelling on public transport, take the seat closest to the driver or select train carriages with lots of people in them, or those close to guards.

- Carefully plan your route when driving and never pick up a hitchhiker.

- Park your car in well-lit areas, don’t leave valuables in sight and have your keys ready as you walk to the car.

- Consider carrying a personal security device, which is a compact alarm that will act as a deterrent.
Making Provisions for Medical Emergencies

Below is a list of eight things that one should keep a record of and provide to those who would offer assistance in an emergency. Consider keeping this information on the fridge and by the telephone.

9) Names of doctors – your GP can be contacted in an emergency and provide up to date information about your medical management

10) Birth date – medical records at hospital will ask for this information

11) Allergies – especially important if you are allergic to medications

12) Major medical problems

13) Current medications

14) Prior surgical history

15) Lifestyle information – smoker; consumer of alcohol

16) Religious beliefs/Advance directives – Outline of any religious beliefs that might influence the type of care one would want to receive. Outline decisions about health care eg. resuscitation efforts.
Preparing for the Future: Wills

- If an individual overlooks making a Will, the estate is divided according to the law and the individual will have no say in how their estate is distributed.

- By having a Will one can ensure that property, valuables and personal items are distributed according to their wishes.

- It doesn’t matter how much things are worth; items may be of sentimental value only or a person may wish to make provisions for the care of others or even pets.

- It is not commonly known that marriage automatically cancels all previous wills. If a person made a Will before marrying and wanted to continue to provide for the beneficiaries nominated in that Will or to make arrangements to cater for the new circumstances, the person must make a new Will.

- In Western Australia, divorce does not automatically cancel a Will. A divorced former spouse could still inherit estate under the previous Will unless a new Will is made.

- If a person dies without a Will the de facto partner may not automatically be entitled to the estate.

- A Will can also be used to specify the type of funeral wanted.

- A professionally drawn and executed Will greatly assists the cost-efficient administration of estate and the early distribution of assets to the named beneficiaries. When making a Will, an executor is appointed who is responsible for looking after the estate and distributing assets according to the instructions contained in the Will.

- Always seek legal advice that relates specifically to one’s personal needs. Contact the Office of the Public Trustee on 9222 6777 for more information.
Preparation for the Future: Powers of Attorney and Guardianship

A Power of Attorney is a legal document that allows another person (someone personally chosen) to:

- Look after financial affairs or
- Make personal decisions or
- To consent to medical treatment on another’s behalf

during a period when an individual is unable to manage their own affairs either temporarily or permanently. It is easy to make and change a Power of Attorney.

The types of Power of Attorney are:

- General – This is for a fixed time period. A general power of attorney means that someone can make financial decisions on another’s behalf for a particular purpose (for example the individual might be out of the country). It is only valid while the individual has ‘legal capacity’.

- An "Enduring Power of Attorney" – This also allows another person the legal authority to make financial and legal decisions on another’s behalf. It can only be made by a person whilst they are still capable of making legal and financial decisions for themselves. It must be signed while a person still has legal capacity and will remain effective even after there is a subsequent loss of capacity due to disability or illness. Once capacity is lost through disability or illness, an Enduring Power of Attorney cannot be signed or revoked.

Choose very carefully the person(s) to whom a power of attorney is given. These individuals are required to act in your best interests and wherever possible to make the same decision, you would have made. Choose someone well known and trusted – and discuss wishes in detail well in advance.

If the person(s) given power of attorney is not acting appropriately, or there is conflict over what action should be taken, the matter can be referred by the concerned party to the Guardianship and Administration Board.
Guardianship

- Guardians are appointed for adults who are unable to make their own decisions due to some form of disability.
- A Guardian may be appointed and given the legal power to make personal or lifestyle decisions about work, living arrangements and medical treatment.
- Contact the Office of the Public Advocate on 9278 7300 for more information.
SESSION TEN:

Review and Closing
SESSION TEN: Review and Closing

Session Outline:

☆ Topic Introduction
☆ Review Session One and Two
☆ Review Session Three
☆ Review Session Four
☆ Review Session Five
☆ Review Session Six
☆ Tea Break
☆ Review Session Seven
☆ Review Session Eight
☆ Review Session Nine
☆ Closing Comments
SESSION TEN: Review and Closing

☆ Closing Comments

- Thank you for participating in our 5 week program. Hopefully you have found it enjoyable and have learnt and found out about ideas and issues that you had never really considered in depth.

- You are encouraged to attend for your follow-up testing so that we can look to see whether there has been any change in your cognitive performance over the course of our program.

- You will be contacted in six months time so that we can see how you have progressed. This will also be an opportunity for you to discuss any concerns or questions you might have regarding the information that has been presented.

- In twelve months time we will contact you to visit us again so that we can complete the testing process and finalise your involvement in the study.

THANK YOU
Alzheimer’s disease

Alzheimer’s (AHLZ-high-merz) disease is a progressive brain disorder that gradually destroys a person’s memory and ability to learn, reason, make judgments, communicate and carry out daily activities. As Alzheimer’s progresses, individuals may also experience changes in personality and behavior, such as anxiety, suspiciousness or agitation, as well as delusions or hallucinations.

In late stages of the disease, individuals need help with dressing, personal hygiene, eating and other basic functions. People with Alzheimer’s die an average of eight years after first experiencing symptoms, but the duration of the disease can vary from three to 20 years.

Although there is currently no cure for Alzheimer’s, new treatments are on the horizon as a result of accelerating insight into the biology of the disease. Research has also shown that effective care and support can improve quality of life for individuals and their caregivers over the course of the disease from diagnosis to the end of life.

Causes of Alzheimer’s disease
Alzheimer’s disease has no known single cause, but in the last 15 years scientists have learned a great deal about factors that may play a role.

Late-onset Alzheimer’s, which chiefly affects individuals over age 65, is the more common form of the illness that is most often associated with the term “Alzheimer’s disease.” The greatest known risk factors for late-onset Alzheimer’s are increasing age and a family history of the disease. The likelihood of developing late-onset Alzheimer’s approximately doubles every five years after age 65. By age 85, the risk reaches nearly 50 percent. Scientists have so far discovered one gene that increases risk for late-onset disease.

Rare, familial types of Alzheimer’s found in a few hundred families worldwide have been linked to specific genes. Individuals who inherit these genes are virtually certain to develop the disease, usually before age 65, and sometimes as early as their 30s or 40s.

Researchers are working to discover other factors that affect Alzheimer risk. Some of the most exciting preliminary evidence suggests that strategies for general healthy aging may also help reduce the risk of developing Alzheimer’s. These measures include controlling blood pressure, weight and cholesterol levels; exercising both body and mind; and staying socially active.

How Alzheimer’s disease affects the brain
Scientists believe that whatever triggers Alzheimer’s begins to damage the brain years before symptoms appear. When symptoms emerge, nerve cells that process, store and retrieve information have already begun to degenerate and die. Scientists regard two abnormal microscopic structures called “plaques” and “tangles” as the hallmarks of Alzheimer’s disease. Amyloid plaques (AM-uh-loyd plaks) are clumps of protein fragments that accumulate outside of the brain’s nerve cells. Tangles are twisted strands of another protein that form inside brain cells. Scientists have not yet determined the exact role that plaques and tangles may play.

Diagnosing Alzheimer’s disease
Although Alzheimer symptoms can vary widely, the first problem that many people notice is forgetfulness severe enough to affect performance at home, at work or in favorite activities. Sometimes the decline in memory may be more obvious to a family member or close friend than to the affected individual. Other common symptoms include confusion, getting lost in familiar places and difficulty with language. The Alzheimer’s Association encourages everyone who notices these symptoms in themselves or someone close to them to consult a physician.

A skilled physician can diagnose Alzheimer’s disease with 90 percent accuracy. Because there is no single test for Alzheimer’s Disease
Alzheimer’s, diagnosis usually involves a thorough medical history and physical examination as well as tests to assess memory and the overall function of the mind and nervous system. The physician may ask a family member or close friend about any noticeable change in the individual’s memory or thinking skills.

Most diagnostic uncertainty arises from occasional difficulty distinguishing Alzheimer’s disease from a related disorder. Alzheimer’s is the leading cause of dementia, a group of conditions that all gradually destroy brain cells and lead to progressive decline in mental function. Vascular dementia, another common form, results from reduced blood flow to the brain’s nerve cells. In some cases, Alzheimer’s disease and vascular dementia can occur together in a condition called “mixed dementia.” Other causes of dementia include frontotemporal dementia, dementia with Lewy bodies, Creutzfeldt-Jakob disease and Parkinson’s disease.

One important goal of the diagnostic workup is to determine whether symptoms may be due to a condition other than dementia. Depression, medication side effects, certain thyroid conditions, excess use of alcohol and nutritional imbalances are all potentially treatable disorders that may sometimes impair memory or other mental functions. Even if the diagnosis is dementia, timely identification enables individuals to take an active role in treatment decisions and planning for the future.

Treating Alzheimer’s disease
Alzheimer medications approved by the U.S. Food and Drug Administration (FDA) may temporarily delay memory decline for some individuals, but none of the currently approved drugs is known to stop the underlying degeneration of brain cells. Certain drugs approved to treat other illnesses may sometimes help with the emotional and behavioral symptoms of Alzheimer’s.

One important part of treatment is supportive care that helps individuals and their families come to terms with the diagnosis; obtain information and advice about treatment options; and maximize quality of life through the course of the illness.

Impact on caregivers
Alzheimer’s has a major impact on those who help care for an affected individual. More than 70 percent of people with Alzheimer’s live at home, where family and friends provide most of their care. As the disease progresses, it places physical, emotional and financial stress on caregivers as they assume growing responsibilities that may include meeting physical needs, managing daily routines and making important medical and legal decisions.

Impact on society
Alzheimer’s takes an enormous toll on society. The Alzheimer’s Association and National Institute on Aging estimate that current direct and indirect costs of caring for the 4.5 million Americans with Alzheimer’s disease are at least $100 billion annually. By 2030, when our entire baby boom generation is over 65, the number of Americans with Alzheimer’s will soar to levels that may exceed our ability to absorb the added cost.

Hope for the future
As the pace of research accelerates, scientists funded by the Alzheimer’s Association, the pharmaceutical industry, universities and our federal government have gained detailed understanding of basic disease processes at work in the Alzheimer brain. Experts believe that several of these processes may offer promising targets for a new generation of treatments to prevent, slow or even reverse damage to nerve cells. Many experts are also convinced that ongoing research will soon clarify the role of cardiovascular factors or other aspects of risk that individuals may be able to influence through lifestyle. A strategy to delay the onset of Alzheimer’s by five years could halve the number of affected individuals over the next 50 years.

For more information about Alzheimer research, treatment and supportive care, please contact the Alzheimer’s Association.

24/7 Helpline 1.800.272.3900
TDD Access 312.335.8882
Web site www.alz.org
e-mail info@alz.org
Fact sheet updated June 2, 2004
IT’S NEVER TOO LATE TO BE ACTIVE

A guide for older adults on the benefits of being active, how to get started, and activities to try.

Prepared by the ‘Clear Mind’ Project Team* with the support of Healthway, Healthy WA.

REFERENCES:


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RECENT RESEARCH HAS SHOWN THAT EVEN THE MOST INACTIVE OR SEDENTARY PEOPLE CAN GAIN HEALTH BENEFITS IF THEY BECOME SLIGHTLY MORE ACTIVE.

Being active in lots of little ways throughout the day, combined with an attitude that regards all forms of physical activity as an opportunity to improve our health, will help increase the amount of physical activity we carry out and improve our well-being.

Improvements in indicators of health - such as blood pressure, blood cholesterol and body weight - can result from putting together shorter amounts of moderate-intensity activities totalling a minimum of 30 minutes a day on most days, or doing 30 minutes continuously.

If you are currently inactive and you start doing more physical activity, you will start to see benefits in 4-12 weeks.

THE NATIONAL PHYSICAL ACTIVITY GUIDELINES FOR AUSTRALIANS REFER TO THE MINIMUM LEVELS OF PHYSICAL ACTIVITY REQUIRED FOR GOOD HEALTH.

They are not intended for high level fitness or sports training. Try to carry out all guidelines and for best results combine an active lifestyle with healthy eating:

1. **Think of movement as an opportunity not an inconvenience.**

   Where any form of movement of the body is seen as an opportunity for improving health, not as a time-wasting inconvenience. The need for even small amounts of movement or physical activity in our daily lives has been reduced. If all movement is regarded as an opportunity to improve health rather than as a time-wasting inconvenience, the benefits of modern technology can be enjoyed without the negative health consequences.

2. **Be active every day in as many ways as you can.**

   Make a habit of walking or cycling instead of using the car, or do things yourself instead of using labour-saving machines. Being active in small ways is likely to provide health advantages to almost all people, irrespective of age, body weight, health condition or disability.
3. Put together at least 30 minutes of moderate-intensity physical activity on most, preferably all, days.

Moderate-intensity activity includes things such as a brisk walk or cycling. Combine short sessions of different activities of around 10 to 15 minutes each to a total of 30 minutes or more. The 30 minutes total need not be continuous.

4. If you can, also enjoy some regular, vigorous exercise for extra health benefits.

Vigorous exercise makes you ‘huff and puff’, and where talking in full sentences between breaths is difficult. For best results, this should be added to the above guidelines on 3-4 days a week for 30 minutes or more each time.

Vigorous exercise can come from active sports such as football, squash, netball and basketball, and activities such as aerobics, circuit training, speed walking, jogging, fast cycling or brisk rowing.

Although there's no age barrier to carrying out vigorous activity, medical advice is recommended for those who have been previously inactive, who have heart disease, or close relatives with heart disease, or who have other major health problems.

WRITE DOWN YOUR USUAL PHYSICAL ACTIVITY AND CALCULATE THE TOTAL AMOUNT YOU DO EACH WEEK.

If you are doing at least 150 minutes of moderate-intensity physical activity each week then you are doing well. You can use something similar to this:

<table>
<thead>
<tr>
<th>Day</th>
<th>Type of Activity</th>
<th>Duration</th>
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<tr>
<td>e.g.</td>
<td>Bowling</td>
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Discuss the amount of activity you are doing with your doctor.
IT IS NEVER TOO LATE TO START BEING PHYSICALLY ACTIVE! WE KNOW THAT PHYSICAL ACTIVITY CAN HELP PREVENT ILLNESS AND DISABILITY AND ALLOW OLDER PEOPLE TO REMAIN INDEPENDENT FOR LONGER.

Independent living depends on being able to do the things you want to do, when you want to do them.

**THINK ABOUT THIS**

- 60% of older adults are inactive.
- Sitting or lying for long periods is a serious health risk.
- Inactivity leads to a decline in bone strength, muscle strength, heart and lung fitness and flexibility.
- Inactivity is as harmful to your health as smoking.
- There is preliminary evidence that physical activity may reduce memory problems and reduce the risk of Alzheimer's Disease.

**Being active reduces the risk of:**
- Heart disease and high blood pressure
- Falls and injuries
- Obesity
- Type 2 (late onset) diabetes
- Osteoporosis
- Stroke
- Depression

**BENEFITS OF PHYSICAL ACTIVITY FOR OLDER PEOPLE**

- Meet new people, make new friends and have more fun
- Maintain independent living
- Better physical and mental health
- Improved quality of life and more energy
- Move with fewer aches and pains
- Better posture and balance and stronger muscles and bones
- Improved self-esteem
- Weight maintenance (when combined with balanced nutrition)
- Relaxation, reduced stress and better sleep.

**IT’S NEVER TOO LATE TO GET MOVING!**

NO MATTER WHAT ANYONE SAYS ... YOU’RE NEVER TOO OLD TO BE ACTIVE.

Gone are the days when older people were told to just sit down and rest. People with physical limitations and chronic conditions can also benefit from being more active. Many people notice straight away that they feel better and get around more easily once they start being more active.
WHAT DO EXPERTS RECOMMEND?

CHOOSE ACTIVITIES THAT YOU LIKE TO DO OR WOULD LIKE TO TRY. TRY AND DO AN ACTIVITY FROM EACH OF THE THREE ACTIVITY GROUPS:

1. Endurance
2. Flexibility
3. Strength & Balance

How much activity do I need?
It is best to be active every day. Build physical activity into your daily routine. 30 to 60 minutes of moderate activity most days of the week will improve your health and fitness. This is not hard to achieve!

1. ENDURANCE ACTIVITIES

Endurance activities help you to increase energy and keep moving for longer periods of time. They make you feel warm and breathe deeply. Endurance activities are good for your heart, lungs, circulation, and muscles.

Activities to Choose From:
- Walking
- Swimming
- Dancing
- Cycling
- Hiking

PREPARING TO CUT DOWN

2. FLEXIBILITY ACTIVITIES

Flexibility activities help you to move more easily so that you can achieve the daily tasks necessary for independent living and self-reliance.

Here are some activities to choose from:
- Stretching
- Dancing
- Gardening
- Washing and waxing the car
- Yard work
- Vacuuming
- Tai Chi
- Golf
- Yoga
- Bowling

Flexibility activities help you keep your joints healthy and maintain your mobility. They will help you to:
- Tie your shoes
- Clip your toenails
- Reach behind your back or straight up overhead
- Reach up to that top shelf in the kitchen.
3. STRENGTH AND BALANCE ACTIVITIES

Strength activities challenge all your muscles and help you to keep muscles and bones strong, and improve balance and posture. When you maintain your strength and balance you are less likely to fall and have accidents that cause injuries.

Here are some activities to choose from:

- Lifting weights or soup cans
- Carrying the groceries
- Carrying the laundry
- Climbing stairs
- Wall push-ups
- Weight-training classes
- Standing up and sitting down several times in a row.

Not sure where to start?
Ask your doctor, health care or fitness provider.

TALK TO YOUR DOCTOR IF YOU HAVE CONCERNS OR HAVEN'T EXERCISED FOR MANY YEARS.

Common physical activity concerns for older people include:

- **Safety and Security**
  For extra security try walking with a friend or join an exercise group. Exercise in areas that are well maintained with few uneven surfaces to reduce the risk of falling.

- **Fear of Injury**
  Begin with activities you can do comfortably and build up to moderate and vigorous activities as your endurance builds. Wear comfortable footwear and clothing.

- **Lack of Skill**
  Choose activities that you enjoy and are confident with. Or register for a class to learn new skills with other adults of a similar age and skill-level.

- **Weather Conditions**
  When it is hot do activity at cooler times of the day and drink plenty of fluid prior to and during and following the activity. When it is cold and wet choose indoor activities.

- **Fear of pain**
  Talk to your doctor if you are concerned about pain. Remember that gentle activities also provide a benefit.

- **Lack of transport**
YOU CAN PREVENT BONE LOSS WITH STRENGTH ACTIVITIES.

Your muscles and bones have to be challenged to get stronger and to maintain their strength as you age. Ask your doctor what would be safe for you.

If you have osteoporosis, being active will be of great benefit, but activities may need to be adapted to provide that benefit without putting you at risk.

Some suggested activities if you have osteoporosis:

- Resistance training that challenges your muscles and bones
- Walking
- Folk or line dancing
- Specialised classes for people with osteoporosis

IF YOU HAVE ARTHRITIS IT IS IMPORTANT TO DO GENTLE MOVEMENTS EVERY DAY TO KEEP YOUR JOINTS FLEXIBLE AND TO KEEP YOU MOBILE.

The more sedentary your lifestyle, the more your joints will stiffen. Seek professional help if you aren’t sure about what is safe for you.

Suggested activities if you have stiff joints:

- Home stretching routines
- Specialty classes for people with arthritis
- Aqua fitness programs
- Walking/wheeling
- Folk or line dancing
- Tai Chi

‘I FEEL TOO TIRED TO GET STARTED’

We often feel that way, but most people who become physically active say that physical activity helps them feel better and gives them more energy. It’s important to choose activities that you enjoy because you will find it easier to get started.
HEART PROBLEMS

TALK TO YOUR DOCTOR OR HEALTH-CARE PROVIDER ABOUT THE PROGRAM THAT IS RIGHT FOR YOU.

They will probably recommend walking, which is one of the best activities to stimulate your circulation, improve the pumping of your heart and provide energy to your muscles.

Check out some good walking paths in your area and ask a friend to join you and or join a local walking group where you can meet new people.

Here are some suggested activities:

- Swimming
- Dancing
- Walking at a moderate pace progressing to a brisk pace as you are able
- Cycling
- Specialised programs for people with heart problems
- Aqua fitness programs

Even if you haven’t been very active, once you get started your body will adjust to your energy needs. Just try something ... a little bit every day will make a difference.

LACK OF TIME

IT’S BEST TO CHOOSE ACTIVITIES YOU ENJOY AND INCORPORATE THEM INTO YOUR DAILY ROUTINE.

As long as you choose activities from the three groups - endurance, flexibility, and strength and balance - your program will give you health benefits and improved function and quality of life.

- Move frequently
- Vacuum
- Dance
- Walk the stairs in your house or apartment
- Do some stretches
- Wash the floors
- Clean up one of the shelves in your kitchen cupboard
- Wash and wax the car
POOR BALANCE AND UNSTEADINESS

IF YOU HAVE POOR BALANCE, START BY DOING SOME ACTIVITIES ON A CHAIR, YOUR BED, OR SUPPORTED BY A WALL.

As you feel stronger try more activities. If you’re not sure what to do, seek help from a health-care professional.

Some ideas to get you started:

- Simple yoga movements or stretching
- Exercises in a sitting or lying position
- Slow walking with a cane or with the support of a friend
- Leg and ankle strengthening
- Line dancing while holding hands
- Tai Chi

Some older people may find it hard to get started because they live alone and find it hard to get motivated without a partner or friend. Perhaps try a group exercise class or club, that way you will meet new people and are more likely to make new friends.

TRY ACTIVITIES IN YOUR AREA

THERE ARE MANY OPPORTUNITIES FOR SENIORS IN WA TO GET INVOLVED IN SPORT AND RECREATION.

For a comprehensive list of sports and activities obtain your free copy of ‘Add Life to Your Years’, produced by the Seniors Recreation Council of WA (Inc.) Ph: 9387 8811.

The booklet contains contacts for seniors groups and activities from swimming, cycling and walking, to yoga, orienteering and gardening.

You can also obtain a community directory of activities from your Local Council.

Every little bit helps, but the more you do the better you will feel.

Increase your activities as your body adjusts to your new physically active lifestyle.
A guide to alcohol consumption and safe drinking for older adults.

Prepared by the ‘Clear Mind’ Project Team* with the support of the Australian Alcohol Education & Rehabilitation Foundation Ltd.

REFERENCES:

Alcohol and older people - a guide for older people. ALAC. New Zealand.

Commonwealth Department of Veterans Affairs. Changing the Mix. A guide to low risk drinking for the veteran community.


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ALCOHOL USE IS VERY COMMON IN AUSTRALIA, AND IS AN ACCEPTED AND OFTEN ENJOYABLE PART OF OUR LIVES.

But alcohol is also a factor in both physical and mental health problems. With increasing age we are more susceptible to the negative effects of alcohol. As we age, a number of changes in our bodies contribute to the increased blood and brain concentration of alcohol for each drink consumed.

There are common life situations experienced by older people that may make them vulnerable to the risk of alcohol-related problems. This booklet aims to provide practical information and strategies for cutting out or cutting down on drinking.

Remember, even small lifestyle changes can make a huge difference to your health, lifestyle and relationships.

DRINKING AT, OR UNDER, THE RECOMMENDED LOW-RISK LEVELS IS UNLIKELY TO HARM YOUR HEALTH.

However, if you are regularly drinking more, you could be harming yourself. Your drinking may be causing you:

- stomach upsets
- diarrhoea
- stress
- sleeplessness
- tiredness
- sexual problems
- nausea
- falls and injuries.

If some of these are already happening to you and you keep on drinking, you may develop worse problems like:

- brain damage
- liver damage
- high blood pressure
- memory problems
- stroke
- inflammation of the stomach lining
- permanent physical disability
- inflammation of the pancreas
- cancer of the liver, mouth, oesophagus & intestines.
RISKS FROM DRINKING ALCOHOL

SOME PEOPLE THINK THAT YOU HAVE TO DRINK HEAVILY ALL OF THE TIME OR BE DEPENDENT ON ALCOHOL TO HAVE ALCOHOL-RELATED PROBLEMS.

This is not true. Some problems can come from having too much every now and again. You may be surprised that alcohol-related problems occur at what you consider to be moderate levels of drinking.

Risks Due to Co-Medication and Alcohol Use

Many commonly used medications interact with alcohol to increase sedation, leaving you at greater risk of intoxication.

Never mix alcohol with medicines of any kind, unless your doctor or pharmacist has told you it is safe.

Risks Due to Regular Use

These problems come from drinking too much on a regular basis. Examples of problems include spending too much money on alcohol, concentration and memory difficulties, depression, poor sleeping habits and weight gain.

Risks Due to High Levels of Alcohol Use

High levels of alcohol use can be associated with anxiety, depression, dementia, losing interest in other activities, feelings of loss of control and withdrawal symptoms. Mild withdrawal symptoms include agitation, sweating, the ‘shakes’, restlessness, confusion and poor sleep. If you experience withdrawal symptoms please seek medical advice.

LOW RISK DRINKING

LOW-RISK DRINKING FOR AN AVERAGE-SIZED HEALTHY MAN IS DEFINED AS:

- An average of no more than 4 standard drinks per day and no more than 6 standard drinks on any one day
- One or two alcohol free days per week

LOW-RISK DRINKING FOR AN AVERAGE-SIZED HEALTHY WOMAN IS:

- An average of no more than 2 standard drinks per day and no more than 4 standard drinks on any one day
- One or two alcohol free days per week

LOWER LIMITS IN OLDER AGE

THE BODY’S ABILITY TO PROCESS ALCOHOL DECREASES WITH AGE AND ALCOHOL REMAINS IN THE SYSTEM FOR LONGER.

Please talk to your doctor about this. If you have health problems, especially if you are on medication, it may be best not to drink at all.

The Australian guidelines recommend that older adults drink less than these average levels. A general guideline is to limit your alcohol intake to 1 standard drink per day. If you are taking medications then the recommended level is zero.
WHAT IS A STANDARD DRINK?

THE FOLLOWING PICTURES SHOW STANDARD DRINKS.

For example, one can or stubbie (375mL) of full strength beer equals about one and a half standard drinks.

ONE DRINK ISN’T ALWAYS ONE DRINK

- 285 mL Middy Full Strength (4.9%) Beer
  1 STANDARD DRINK
- 285 mL Middy Low Alcohol (2.7%) Beer
  0.5 OF A STANDARD DRINK
- 375 mL Full Strength (4.9%) Beer
  1.5 STANDARD DRINK
- 30 mL Spirit Nip (40%)
  0.5 OF A STANDARD DRINK
- 100 mL Standard Serve of Wine (12%)
  1 STANDARD DRINK
- 60 mL Port/Sherry (18%)
  1 STANDARD DRINK

HELPFUL HINTS ON SAFER DRINKING

IF YOU THINK YOU MAY BE DRINKING TOO MUCH, TRY KEEPING A DIARY LIKE THE ONE ON PAGE 13 OF THIS BOOKLET.

When you do drink make sure you avoid problems by following these safe drinking tips:

- Keep in mind that extra strength beers, ciders or lagers may be twice as strong as ordinary beers, and drinks we pour ourselves at home, may be bigger than we would be given in a pub.
- Take your time. Your liver needs at least an hour to break down one standard drink of alcohol. If you drink faster than this, alcohol will build up in your body.
- Eat something with your drink, and make it a rule not to drink on an empty stomach.
- Avoid drinking if you feel unwell, depressed, overtired or cold, and especially if you are taking medicines.
- If you are trying to cut down, plan to spend more time doing things or being in places that don’t make you think of drinking. Try to meet friends at cafes, community centres or clubs where alcohol is not sold, to avoid the pressure of social drinking.
- Avoid drinking in rounds, buy your friends a round then opt out.
- Make sure you have two alcohol free days each week.
HELPFUL HINTS ON SAFER DRINKING

- Know how much you drink. Using your drinking diary will help you keep track of how many drinks you have, and make it easier to stick to your limit.

- Try having a warm bath at bedtime, rather than alcohol. An occasional étotí in your drink may do no harm, but be aware of the temptation to drink more. Bedtime herbal teas, available from health shops, can be a good substitute.

- Don’t operate machinery, drive or do other potentially risky activities when you have been drinking. Blood alcohol concentration will, in general, remain below 0.05 in a man of average size who drinks no more than two drinks in the first hour and per hour thereafter, and in a woman of average size who drinks no more than one standard drink per hour.

- In older adults one drink is more likely to increase the blood alcohol level above 0.05 because our bodies are more sensitive to the effects of alcohol as we age.

PREPARING TO CUT DOWN

IF YOU DECIDE YOU WOULD LIKE TO CUT DOWN YOUR DRINKING, YOU ARE MORE LIKELY TO SUCCEED IF YOU PREPARE YOURSELF WELL.

To help you get ready you may find it useful to:

- Understand when and why you drink
- Set a date to start
- Set short-term goals
- Get support
- Plan ways to cope ahead of time

Understand When and Why You Drink

If you are contemplating cutting down, it is important to know exactly how much you are drinking. By counting your drinks, you can get a clear idea of how much you drink, where and with whom.

Keep a diary of your drinking for a week. While it may seem like hard work, it will really help you get an idea of your current pattern of drinking. This will be important in planning a program to help you cut down.

On page ?? of this booklet is a one week drinking diary. You can make your own diary similar to this, which will help you understand why you sometimes drink more than you intend to.

Talk to your doctor if you are concerned about your drinking habits.
**Setting a Date**

Pick a date to cut down drinking. Pick a date when you feel ready and can put all your energy into your goals. Try to choose a date when you won’t be stressed.

**Setting Short-Term Goals**

Changing behaviour can be very challenging. That is why it is best to start off by setting small, achievable goals. Small results which you achieve relatively quickly often encourage you to keep going.

**Getting Support**

Many people who are trying to cut down find it useful to have a support person. Your supporter needs to be someone you can trust and rely upon. They can help you through the hard times but also share your achievements with you.

**Planning Ways to Cope**

Sometimes you may find it harder than other times to reduce your drinking, for example at social occasions. Your drink diary can help you identify the times, moods and situations where you drank more. You can then look at ways to prepare for those same situations in the future. You may like to review your drink diary with your doctor, or chosen supporter.

**Talk about ways you can cope in high risk situations, ahead of time.**

---

**ONE WEEK DRINKING DIARY**

- Your drink diary should be completed every day
- It should be completed as soon as possible after each occasion when you drink.
- Accurately record the time, the drinking situation and the number and type of drinks you consumed
- Calculate the total number of drinks

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<th>Situation (place, people, thoughts)</th>
<th>Number &amp; Type of Drink</th>
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**IF THINGS GO WRONG**

**Prepare for Slip-Ups**

It is a good idea to plan what to do to cope with slip-ups before they happen. Think about who you could call if you are tempted to start drinking again. You can also call this person if you have begun to have a lapse and want to end it as soon as possible.

**Coping With Slip-Ups**

If you do slip-up, don’t think it is the end of your efforts. **LAPSES AND SLIP-UPS ARE NORMAL!**

The worst thing to do is to blame yourself or to start thinking you’ve failed. You may just have to revise your strategies or your drinking guidelines and continue trying.

By making these slips we learn how to avoid future pitfalls. Think about what caused you to slip-up and find ways of dealing with such triggers in the future. Discuss it with your supporter, friends or your doctor. Look at your original reasons for cutting down - renew your determination to succeed.

Be kind to yourself if you do slip and haven’t achieved all your goals. Change doesn’t happen overnight. Be patient.

Remember, small steps in the right direction take you closer towards your goal.

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**ASKING FOR HELP**

SHARE YOUR PROBLEMS AND TALK TO YOUR FAMILY, FRIENDS, YOUR DOCTOR, THE PRACTICE NURSE OR A SOCIAL WORKER.

Don’t feel embarrassed to ask for information and advice about your drinking if you feel you need help.

For more information on alcohol and drinking, contact:

**The Alcohol and Drug Information Service (ADIS)**
Ph: 9442 5000
Or 1300 131 340 (freecall for country callers)

**Alcoholics Anonymous (AA)**
251-257 Hay St East Perth WA 6004
PO Box 6221 East Perth WA 6892
Ph: 9325 3566
Fax: 9325 3557

**Noongar Alcohol and Substance Abuse Service Inc. (N.A.S.A.S)**
176 Wittenoom St East Perth WA 6004
Ph: 9221 1411
Fax: 9221 1585
Cooking for One or Two

- Learn how to cook quick and easy meals for one or two people
- Gain confidence in the kitchen
- Try new recipes and foods
- Meet new people
- Learn about healthy eating
- Learn new skills

Where: Bedford Bowling Club—145 Grand Promenade, Bedford

When: Fridays commencing 15th June

Time: 10:30am–1:30pm

Cost: $7.00 per session

Contact: To book, please contact Stephanie McFaull from Nutrition Australia on (08) 6304 5714 or email s.mcfaul@ecu.edu.au
Cooking for One or Two Program

Do you want to…

- Learn how to cook quick and easy meals for one or two people
- Gain confidence in the kitchen
- Try new recipes and foods
- Meet new people
- Learn about healthy eating and
- Learn new skills

**Duration:** Once per week for six-weeks

**Time:** 10:30 am to 1:30 pm.

**Aim:** To motivate veterans and the wider community 50 years and over to cook healthy and tasty meals.

**Cost:** $7.00 per week.

For more information about the Cooking for One or Two program, or to register your interest, please contact Stephanie McFaul from the WA Division of Nutrition Australia, on (08) 6304 5714 or email s.mcfaul@ecu.edu.au

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[Logo: Nutrition Australia] [Logo: Australian Government Department of Veterans’ Affairs]
Reducing stress

STRESS MANAGEMENT

Stress is a response to an event or situation. It can be positive or negative. Stress is common in daily life and may be associated with work, family or personal relationships. It usually means that something is happening that’s causing worry and affecting how we are thinking and feeling.

Think about what you’ve been doing and how you’ve been feeling over the last two weeks. Have you:

1. Found it hard to relax most of the time?  
   - YES  
   - NO
2. Felt stressed and overwhelmed most of the time?  
   - YES  
   - NO
3. Felt panicky and anxious most of the time?  
   - YES  
   - NO

If you’ve answered YES to one or more of these questions, it might be helpful to use the information in this fact sheet to reduce your stress.

Stress management teaches you about:
- Managing stress and anxiety symptoms
- Breathing exercises to decrease your stress and anxiety
- Relaxing and the importance of physical activity.

WAYS TO REDUCE STRESS

Stress is common in daily life and may be associated with work, family or personal relationships. Whatever the cause, there are some simple steps that can help you to reduce stress.

Postpone major life changes
- Making major changes in your life can be stressful at any time. If you’re feeling stressed or anxious, it’s probably a good idea to try to avoid moving house or changing jobs. Leave them to a time when you’re feeling better.

Resolve personal conflicts
- Stress in personal relationships often contributes to depression. Talk to a counsellor or psychologist who can help you find ways to address your problems.

Do the things you enjoy
- You may find you are enjoying yourself less and spending more time worrying. In order to relax effectively, you need to allocate time to do the things you enjoy, such as exercising, meditating, reading, gardening or listening to music.

Control your work
- Take control of your work by avoiding long hours and additional responsibilities. This can be difficult, but small changes can make a difference.
- Learn to say ‘No’ more often. Create a balance between work and the things you enjoy doing. Don’t allow yourself to be overwhelmed by new commitments.
- Make sure you have enough time to rest, relax and exercise.
- Part of learning to relax requires you to set aside some time in the day to do the things you enjoy.

Exercise regularly
- Physical exercise such as walking, swimming, dancing, playing golf or going to the gym can help relieve the tension in your muscles and relax your mind.
- Try to do some physical exercise every day, even if it’s just going for a walk.

Seek help
- Talking to a friend, doctor, counsellor or someone else you trust, can help to relieve your stress. Asking for help and support at home, at work or in your other activities can also reduce stress.

SLOW BREATHING EXERCISE

Have you noticed that you’re breathing too fast? Stress and anxiety can affect your heart rate and breathing patterns. A relaxed breathing rate is usually 10 to 12 breaths per minute.

Practise this exercise three to four times a day when you’re feeling stressed or anxious so that you can use this as a short-term coping strategy.

1. Time the number of breaths you take in one minute. Breathing in, then out is counted as one breath.
2. Breathe in, hold your breath and count to five. Then breathe out and say the word ‘relax’ to yourself in a calm, soothing manner.
3. Start breathing in through your nose and out slowly through your mouth, in a six-second cycle. Breathe in for three seconds and out for three seconds. This will produce a breathing rate of 10 breaths per minute. In the beginning, it can be helpful to time your breathing using the second hand of a watch or clock.

continues overleaf...
4. Count to yourself.
5. Continue breathing in a six-second cycle for at least five minutes or until the symptoms of overbreathing have settled.

After practising this exercise, time the number of breaths you take in one minute. Practise the slow breathing exercise each day before breakfast, lunch, dinner and bedtime. Use the technique whenever you feel anxious. Gradually, you’ll be familiar enough with the exercise to stop timing yourself.

Practise this exercise three to four times each day, so that it becomes easy to use as a short-term coping strategy when you feel anxious.

MUSCLE TENSION EXERCISE

When you are feeling anxious, your muscles become tense. When your muscles remain tense for long periods, you can start to develop aches and pains, fatigue, headaches and difficulty breathing.

Take a few minutes to do this exercise. It will help you understand how muscle tension can cause pain and fatigue.

1. Hold a piece of paper in your hand and stretch your arm out in front of you.
2. Keep holding the paper for a few minutes without moving your arm.

You will probably notice that your arm feels tired after only a few minutes and may even start to ache in some places. Imagine how your arm would feel if you continued to hold that piece of paper for a number of hours. Although the paper is not heavy, keeping your muscles tense for any length of time can cause pain.

MUSCLE RELAXATION EXERCISE

This exercise helps to reduce physical and mental tension. Practise this exercise regularly and at the first signs of muscle tension.

1. Sit in a comfortable chair in a quiet room
2. Put your feet flat on the floor and rest your hands in your lap
3. Close your eyes
4. Do the slow breathing exercise for three minutes
5. After three minutes of slow breathing, start the muscle relaxation exercise below
6. Tense each of your muscle groups for 10 seconds, then relax for 10 seconds, in the following order:
   - Hands: clench your hands into fists, then relax
   - Lower arms: bend your hands up at the wrists, then relax
   - Upper arms: bend your arms up at the elbow, then relax
   - Shoulders: lift your shoulders up, then relax
   - Neck: stretch your neck gently to the left, then forward, then to the right, then backwards in a slow rolling motion, then relax
   - Forehead and scalp: raise your eyebrows, then relax
   - Eyes: close your eyes tightly, then relax
   - Jaw: clench your teeth, then relax
   - Chest: breathe in deeply, then breathe out and relax
   - Stomach: pull your tummy in, then relax
   - Upper back: pull your shoulders forward, then relax
   - Lower back: while sitting, roll your back into a smooth arc, then relax
   - Buttocks: tighten your buttocks, then relax
   - Thighs: push your feet firmly into the floor, then relax
   - Calves: lift your toes off the ground, then relax and
   - Feet: gently curl your toes down, then relax.
7. Continue slow breathing for five more minutes, enjoying the feeling of relaxation
8. As you become better at relaxation, it can be more interesting to combine these exercises with memories of relaxing situations eg. lying on a beach or doing a favourite activity.

A full session of relaxation takes about 15 to 20 minutes. Once you are good at relaxing your muscles, start relaxing tense parts of your body during the day while you are going about your daily activities.

MORE INFORMATION

Coping strategies for depression and anxiety: beyondblue Fact sheet 7: Sleeping well beyondblue Fact sheet 8: Keeping active beyondblue Fact sheet 9: Reducing alcohol and other drugs

Other treatments for depression and anxiety: beyondblue Fact sheet 10: Changing your thinking beyondblue Fact sheet 11: Antidepressant medication beyondblue Fact sheet 14: What other treatments are available for depression and anxiety?
WHAT IS DEPRESSION?

Depression is more than just a low mood – it’s a serious illness.

People with depression find it hard to function every day.

Depression can have serious effects on physical and mental health.

HOW DO YOU KNOW IF AN OLDER PERSON IS DEPRESSED AND NOT JUST SAD?

Depression in older people is common and may occur for different reasons. The onset of a physical illness or personal loss and sadness can be common, but depression is not a normal part of ageing.

An older person may be depressed, if for more than two weeks they have...

1. Felt sad, down or miserable most of the time, OR
2. Lost interest or pleasure in most of their usual activities.

AND experienced symptoms in at least three of the following categories:

1. Behaviours
   - General slowing down or restlessness
   - Neglect of responsibilities and self-care
   - Withdrawing from family and friends
   - Decline in day-to-day ability to function, with confusion, worry and agitation
   - Inability to find pleasure in any activity
   - Difficulty getting motivated in the morning
   - Behaviour which is out of character
   - Denial of depressive feelings – this can be used as a defence mechanism

2. Thoughts
   - Indecisiveness
   - Loss of self-esteem
   - Persistent suicidal thoughts
   - Negative comments eg. “I’m a failure”, “It’s my fault,” “life is not worth living”.
   - Concerns about financial situation
   - Perceived change of status within the family

3. Feelings
   - Moodiness or irritability – may present as angry or aggressive
   - Sadness, hopelessness or emptiness
   - Overwhelmed
   - Worthless, guilty

continues overleaf...
Depression in older people

4 Physical Symptoms

- Sleeping more or less than usual
- Feeling tired all the time
- Unexplained headaches, backache or similar complaints
- Digestive upsets, nausea, changes in bowel habits
- Agitation, hand wringing, pacing
- Loss or change of appetite
- Significant weight loss or gain

Everyone experiences some or all of these symptoms from time to time, but when symptoms are severe and lasting, it’s time to get professional help. Dementia can also co-exist and mask depression and a thorough assessment is recommended.

Early detection and treatment may help to keep depression from becoming severe. Depression is treatable and effective treatments are available.

WHAT MAKES AN OLDER PERSON MORE AT RISK OF DEPRESSION?

- An increase in physical health problems/conditions eg. heart disease, stroke, Alzheimer’s disease
- Chronic pain
- Side-effects from medications
- Losses: relationships, independence, work and income, self-worth, mobility and flexibility
- Social isolation
- Significant change in living arrangements eg. moving from an independent to care setting
- Admission to hospital
- Particular anniversaries and the memories they evoke.

HOW COMMON IS DEPRESSION?

Very common. Around one million Australian adults live with depression each year. On average, one in five people will experience depression in their lifetime; one in four women and one in six men.

Depression rates are higher in aged-care facilities, with as many as 51% of high-care and 30% of low-care residents reported as depressed.*
WHAT ARE THE TREATMENTS FOR DEPRESSION?

Depression is treatable

Different types of depression require different types of treatment. This may include physical exercise for preventing and treating mild depression, through to psychological treatment and drug treatments for more severe levels of depression. Along with community support, these are the most effective treatments for depression in later life.

Depression must be recognised in order to be treated. The key to successful treatment is an appropriate assessment by a GP or health professional. Both personal and professional carers are an invaluable source of information about personality or cognitive changes in the person and should be included in discussions where possible.

Psychological treatments

Psychological treatments address issues that particularly affect people with depression.

- Cognitive Behaviour Therapy (CBT) helps to correct negative thought patterns.
- Interpersonal Therapy (IPT) helps to improve relationships.

Medications

People who are depressed often feel physically unwell, with resulting sleep and appetite changes.

- Antidepressant drug treatments relieve the physical symptoms of depression and can be very helpful. It’s important that any current medication is also reviewed.
- Medication can take between seven to 21 days to work effectively.
- The decision to start taking antidepressant medication is one that should be carefully considered and supervised by a doctor. This should also be the case when going off medication. Stopping medication should only be done gradually, on a doctor’s recommendation and under their supervision.
Depression in older people

WHAT CAN YOU DO?

If you or someone you know needs help, talk to your doctor or another mental health professional about getting the RIGHT help.

More fact sheets on a range of depression-related topics are available from the beyondblue website: www.beyondblue.org.au or by calling Lifeline’s Just Ask information line on 1300 13 11 14.

• Suggest the person sees a doctor or health professional.
• Offer practical support by assisting the person to make an appointment and either provide or arrange transport.
• Offer assistance at the person’s home.
• If someone has been prescribed antidepressant medication, encourage the person to continue taking it as directed and assist them to discuss the treatment with their doctor.
• If the person complains of side-effects from the medication, encourage them to discuss these with their doctor.

* Challenge Depression Project, Commonwealth Department of Health and Ageing, 2001
Most people assume that depression is caused simply by recent personal difficulties. Depression however, is often caused by the mix of recent events and other longer-term or personal risk factors.

Research indicates that ongoing difficulties, such as long-term unemployment or living in an abusive or uncaring relationship, are more likely to cause depression than recent life stressors. Depression can also run in families and some people will be at increased genetic risk. However, this doesn’t mean that you will automatically become depressed if a parent or close relative has had the illness. Life circumstances are still likely to have an important influence on your chances of becoming ill.

It’s also common for people to experience depression and anxiety at the same time.

What causes depression?

Common medical causes of depression include:
- Low thyroid function
- Brain injuries and diseases (e.g., stroke, heart disease, head injury, epilepsy, Parkinson’s Disease)
- Some forms of cancer
- Infectious diseases
- Blood vessel disease in the brain due to diabetes and/or hypertension
- Some steroid and hormonal treatments
- Chronic pain
- Quitting smoking.

High-risk personality being:
- A lifelong worrier
- A perfectionist
- Sensitive to personal criticism
- Unassertive
- Self-critical and negative
- Shy, socially anxious and having low self-esteem.

Common tests done by a doctor include:
- Full blood count and biochemistry
- Thyroid function tests
- Urine test for sugar and protein
- Occasionally, a brain scan.

It’s important to note that you can’t always identify the cause of depression nor change troubling circumstances. The most important thing is to recognise the depression and to seek help.

Remember, the sooner you get treatment, the greater the chance of a faster recovery.
A concise information guide for older adults.

This guide has been produced to provide older adults with information on the effects of sleeping tablets and on how to sleep well.

Prepared by the ‘Clear Mind’ Project Team* with the support of the Australian Alcohol Education & Rehabilitation Foundation Ltd.

REFERENCES:

Health Department of Western Australia. A Good Night’s Sleep. 2001. HDWA, Perth.


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MOST PEOPLE EXPERIENCE OCCASIONAL PROBLEMS WITH THEIR SLEEP THROUGHOUT THEIR LIVES.

More often than not, these problems are short-lived and resolve spontaneously. However, some people experience more persisting problems with their sleep that may be severe enough to interfere with their daily functioning.

HOW DO I KNOW IF I HAVE A SLEEP PROBLEM?

Several basic features of our sleep change as we age. Most people will need to sleep less hours (5 to 8 hours) during the night with increasing age, and many will wake up once or twice during the night (quite often to use the toilet). This is normal.

You may be experiencing problems with your sleep when:

- It takes you an hour or more to go to sleep once you are in bed
- You wake up in the middle of the night (say 2 am) and cannot go back to sleep
- You feel tired and unrefreshed in the morning and throughout the day
- You feel excessively sleepy during the day
- You snore excessively and have intermittent breathing problems at night
- You move or kick excessively during your sleep

It is also important to remember that sleep difficulties may arise in some circumstances, such as travelling (due to jet-lag or the use of a different bed), stress, depression, use of certain medications, pain or illness. In such cases, it is important to resolve the underlying contributing factors before considering the need for sleep treatment.

Common drugs that have insomnia as a side-effect:

- Beta-blockers (such as propranolol)
- Corticosteroids
- Phenytoin
- Calcium-channel blockers
- Bronchodilators (such as in some medications for asthma)
- Some antidepressants (such as fluoxetine, citalopram, sertraline, paroxetine, fluvoxamine)
- Some decongestants
- Diuretics
- Thyroid hormones
- Stimulants antiarrhythmic agents
- Coffee and tea
- Alcohol
- Nicotine (smoking)
OVERCOMING SLEEP PROBLEMS

OVERCOMING SLEEP PROBLEMS ALWAYS INVOLVES A ‘BEHAVIOURAL COMPONENT’ AND, SOMETIMES, THE USE OF MEDICATION.

There are a number of things you can do to improve the quality of your sleep!

• **Regular Sleep-Wake Schedule**
  It is very important to wake up at a regular time in the morning (including weekends)

• **Proper Sleep Environment**
  Ensure your bedroom is pleasantly cool, dark and quiet, and that your bed is comfortable. Avoid listening to the radio or watching TV in bed.

• **Wind-Down Before Going to Bed**
  Try to do something relaxing and different from your daily routine, such as reading or listening to music at least 30 minutes before sleeping time.

• **Use Your Bed to Sleep**
  The bedroom should be used to sleep and for sexual activity. Activities such as eating, drinking, arguing, discussing the day’s problems or playing games should be done elsewhere.

DO YOU MEET THE GUIDELINES?

• **Avoid Worrying in Bed**
  Most people will find it difficult to go to sleep if they are worrying about things that have happened or may happen in the future. If you are in bed for 30 minutes and are unable to go to sleep get up and do something else (such as reading). Go back to bed once you start feeling sleepy again.

• **Avoid Poorly Timed Alcohol and Caffeine**
  Caffeine is a stimulant and if you drink it a few hours before your normal bedtime, you may experience difficulties going to sleep. A small quantity of alcohol (such as a glass of wine) can be relaxing before bedtime, but the consumption of a larger amount may disrupt your sleep during the night. Some people also find that smoking disrupts their sleeping pattern.

• **Bedtime Snack**
  Avoid eating in excess at night, as this may disturb your sleep. A light, high-tryptophan (tryptophan is an essential amino acid) snack before bedtime (a glass of milk or banana) can promote sleep onset in some people.

• **Regular Physical Activity**
  Exercising 20-30 minutes most days of the week is not only good for your general health, it also promotes good sleep! However, you should avoid exercising 2-3 hours before bedtime, as the stimulation associated with physical activity may delay sleep onset.
The management of some sleep disorders may include the use of medication. At present, the preferred agents for the treatment of insomnia are short-acting non-benzodiazepine hypnotics, such as zolpidem or zalepon. However, the group of drugs known as 'benzodiazepines' still are the most frequently used hypnotics in Australia. Oxazepam, lorazepam, temazepam and diazepam are examples of benzodiazepines.

Older people tend to wake earlier and feel sleepy earlier in the evening and have less deep sleep. The use of benzodiazepines makes this situation worse and increases the number of times a person wakes during the night.

Benzodiazepines produce tolerance; i.e. it is necessary to increase the dosage of the medication with time to maintain the same clinical effect. Sleeping tablets can therefore lead to a person waking during the night.

The best clinical evidence currently available suggests that sleeping tablets should NOT be used regularly and certainly not for prolonged periods of time (3 months or more).

Common side-effects of sleeping tablets include:

- Excessive drowsiness during the day
- Slower reaction time
- Impaired judgement
- Impaired memory and concentration
- Anger
- Feeling panicky
- Incontinence
- Disruption of the sleep-wake cycle
- Disruption of sleep pattern
- Irritability and mood swings
- Increased risk of falls and fractures
- Increased risk of falls and fractures

Side Effects of Sleeping Tablets

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- Slower reaction time
- Impaired judgement
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- Irritability and mood swings
- Increased risk of falls and fractures

The best clinical evidence currently available suggests that sleeping tablets should NOT be used regularly and certainly not for prolonged periods of time (3 months or more).
WHAT ARE THE ADVANTAGES IF I STOP?

THE CHRONIC USE OF SLEEPING TABLETS HAS BEEN ASSOCIATED WITH INCREASED PREVALENCE OF MENTAL HEALTH PROBLEMS, SUCH AS DEPRESSION, MEMORY IMPAIRMENT, FALLS, HIP FRACTURE AND ACCIDENTS.

This can happen at any time, and it does not really matter how long you’ve been on it (1 month or 10 years).

It is never too late to stop taking sleeping tablets. It is always worth trying to stop, even if you have been taking them for many years.

HELPFUL HINTS FOR REDUCING THE USE OF SLEEPING TABLETS

• Commence your reduction plan at a time when you are not feeling too stressed.
• Maintain close contact with your doctor.
• Find a supportive friend or family member who is a good listener.
• Keep a diary of the times you sleep and for how long, and any of any symptoms you may experience. Discuss these with your doctor.
• Record in your diary when and what tablets you take, and your feelings or actions when you take the tablet.
• Eat a healthy, balanced diet with a variety of fresh foods and lots of water (at least 8 glasses each day).
• Try not to drink alcohol within a few hours of going to bed, or keep it to a minimum, as it may make you wake up more often during the night.
• Smoking cigarettes may also make you feel worse, so try to quit or reduce the amount you smoke if possible.

HOW TO REDUCE OR DISCONTINUE THE USE OF SLEEPING TABLETS

The prolonged use of sleeping tablets is associated with poor long-term health. Therefore, it is important to consider the best strategy to reduce or discontinue their use if you have been taking them for a long period of time.

Keep in mind that not everyone is able to successfully come off sleeping tablets the first time they try.

Your doctor can provide you with advice on how best to reduce the use of sleeping tablets without causing you major discomfort.

Your doctor may complete the “Reduction Plan for Sleeping Tablets” on the back of this booklet for you.
WHAT WILL HAPPEN WHEN I STOP TAKING SLEEPING TABLETS?

YOU MAY EXPERIENCE SOME DISCOMFORT PARTICULARLY DURING THE FIRST FEW DAYS.

However the amount of discomfort varies from person to person. Most people start taking sleeping tablets to help them sleep. However, chronic use may lead to increased severity of sleep problems! This may be more noticeable in the first few days after they are discontinued. This is normal, expected, and likely to get better over time.

Not everyone feels the same or has the same symptoms. In fact, many people do not feel anything at all. Contact your doctor if you experience withdrawal symptoms, such as irritability, sweating, dizziness or nausea (see also page 5).

ALTERNATIVES TO SLEEPING TABLETS

There are alternatives to taking sleeping tablets. Good sleep hygiene can help (see pages 3-4). For example, learn and practice relaxation techniques that will help you fall asleep. Try yoga, breathing techniques or a warm bath.

Your doctor can write you a personalised sleep hygiene prescription as well.

SLEEP DIARY

Try keeping a diary of your sleep patterns and activities that may affect your sleep, for one week. This will be helpful when discussing your sleep problems with your doctor.

Each evening record the time during the day at which you:

- Eat meals and snacks
- Drink tea, coffee, cocoa, cola drinks and alcohol
- Take naps.

Then in the morning record:

- The time you wake up, and whether you wake with or without an alarm
- The time you get out of bed
- An estimate of how long it takes to fall asleep
- The amount of time you are asleep, and any time awake during the night. Guess the time, do not watch the clock during the night.

If worry is causing you sleeplessness, talk to someone and try relaxation techniques.
### SLEEP DIARY EXAMPLE

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Sleep Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 pm</td>
<td>10 min nap</td>
<td></td>
</tr>
<tr>
<td>7 pm</td>
<td>Dinner with a small glass of red wine</td>
<td></td>
</tr>
<tr>
<td>9 pm</td>
<td>Cup of herbal tea and biscuit</td>
<td></td>
</tr>
<tr>
<td>11 pm</td>
<td>Small glass of milk</td>
<td>Bed-11:30 asleep</td>
</tr>
<tr>
<td>12 am and so</td>
<td>Sleep-woke up at around 3am</td>
<td></td>
</tr>
<tr>
<td>so on until</td>
<td></td>
<td></td>
</tr>
<tr>
<td>morning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Use this example to create your own sleep diary.*

### REDUCTION PLAN FOR SLEEPING TABLETS

Name:

Your doctor has advised you to come off these medicines at your own pace. You can come off them gradually so that it is easier to adjust without them. It usually takes 6-8 weeks, but can take longer, until you no longer need a sleeping tablet.

Number of tablets/capsules of (name and strength)

<table>
<thead>
<tr>
<th>Week Beginning</th>
<th>Time tablet is to be taken:</th>
<th>Time tablet is to be taken:</th>
<th>Time tablet is to be taken:</th>
<th>Time tablet is to be taken:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon</td>
<td></td>
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<td>Tues</td>
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<td>Wed</td>
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<td>Thurs</td>
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<td>Fri</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments:

GP Signature:
Safe and Secure Living
Your Personal Handbook (version 2)
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Part 1 | General

1.1 Emergency Numbers

**EMERGENCY 000** (Some telephone service providers use an alternative number; you should check with your company).

**AMBULANCE / POLICE / FIRE BRIGADE**

When you call **000** you will be connected to an operator who will ask you which service you require — AMBULANCE or POLICE or FIRE BRIGADE. The operator of that service for will then ask you:

- Your street name
- Your house number/location
- The State from where you are calling
- A description of what has happened
- Your name
- Your phone number
- Any other relevant details such as the nature of the problem and the number of people involved.

**Phone**

If you own a phone that can store numbers, you may need to key in emergency numbers. These numbers may include those of family, close friends, neighbours, your local doctor, chemist, plumber or electrician.

If unsure, your telephone service provider will be able to provide instructions to assist.

**For those who wish to records these numbers, the following spaces are provided:**

Aurora ____________________________
Crime Stoppers Hotline 1800 333 000
Doctor ____________________________
Emergencies: Police/Fire/Ambulance 000
Friend/Relative/Neighbour ______________
Hospital ____________________________
Local council _______________________
Local Electrician / Plumber ___________
1.2 Foreword

Feeling safe and secure in our homes and in the wider community can positively influence how we live our lives. Remaining independent and actively participating in community life becomes increasingly more important with age.

The Tasmanian Government is committed to protecting the right of all Tasmanians to feel safe and has demonstrated this commitment through Tasmania Together 2020 and its support of safety initiatives.

In 2000, the first “Safe and Secure Living” booklet was published and has been widely recognised as a valuable safety resource for older people, as well as the general community.

This revised version of the booklet continues to offer simple, practical tips and strategies to improve personal and household safety. In addition to many of the original suggestions the booklet has attempted to address some contemporary issues; notably advances in technology have provided opportunities for crimes such as fraud and scams.

I encourage you to read Safe and Secure Living and introduce some of the practical precautions into your everyday life. Our individual actions can assist in decreasing crime in Tasmania, but more importantly feeling safe and less vulnerable will enable us all to lead more independent and enjoyable lives.

David Llewellyn MHA
Minister for Police and Emergency Management
1.3 How to use this Booklet

Read the information.

Read one section of the booklet at a time. Don’t try to read the whole booklet in one session. You can select any section to work on; you don’t have to start at the front. Holiday security for example, may not be of interest until you are actually planning to go away for a holiday. You don’t have to act on every recommendation, only those appropriate for you.

We are less likely to be victims of crime if we take precautions. This booklet provides a number of important precautions for your reference. It also provides checklists, for you, friends or relatives to tick off when action has been taken to modify a deficiency in your security measures.

To help make a decision about action appropriate for you, you could give each item a priority rating according to:

- whether you think it is **essential or appropriate** that action be taken; and
- whether you think **you can afford the financial cost** of taking action.

In some cases, there are landlords, organisations and community groups who may provide assistance.

Actions needed may be rated 1, 2 or 3 depending on need or urgency. The most important issues could be rated as 1 with the least important as 3. If you identify items requiring immediate action but you can’t afford it, you might:

- plan to save to have future action taken
- seek family support – e.g. make suggestions for birthdays or Christmas gifts.
Part 2 | Home Security

Research has shown that a good-quality alarm system is the most effective form of home security. However, it is not always necessary to spend large amounts of money on security. Simple changes to make your house look occupied can be an effective deterrent to would-be intruders. By conducting a check of the security of your home and possessions, you will be able to develop a plan to make improvements.

2.1 Doors and Windows

- Sturdy entrance doors together with quality security doors provide a good first line of defence. Key operated door and window locks, keyed alike are great safety and convenience items. Deadlocks that need to be opened with a key from both sides are useful in preventing the loss of your valuable items whilst you are not at home. Remember, at home it is unwise to deadlock yourself in. If you do not like leaving deadlocks unlocked an alternative strategy is to leave keys in any deadlock or on a hook (preferably attached to a chain) close to the door or window, but out of reach of intruders to enable a speedy exit if necessary.

- A security chain fastened to the door will also help you to check first before letting anyone in; keep security doors locked at all times.

- Fit a double-sided locking handle and patio door bolts to all sliding doors. A snug fitting block of wood placed in the lower rack of the sliding door can also make it more difficult for intruders to slide the door open far enough to gain entry. Self-tapping screws in the top frame will also prevent sliding doors and windows being lifted out — make sure there is still enough clearance for the door or window to slide. Another alternative is to fit sliding window locks.

- A peephole in all external doors and a light outside allows you to see who is there.
If possible, replace louvre windows as these often provide easy access for intruders; alternatively, consider installing aluminium or steel security grilles over these types of windows; if you like to leave windows open, again, solidly constructed grilles are an effective deterrent for intruders.

2.2 External Security

- Your home should be clearly visible from the street with house numbers easily identifiable. House numbers painted on the kerb will help emergency services find you quickly. Clearing away excess trees, bushes and other vegetation provides an unobstructed view of unwanted intruders by your friends and neighbours.

- Never hide keys outside. Do not give keys to people you don’t know (including tradespeople).

- Ensure that doorway and perimeter lighting is sufficient to illuminate surroundings. Consider installing sensor lights. These will not only activate when you arrive home at night, but will also deter prowlers.

- Consider keeping a dog. This is also a good idea for health and companionship reasons as well as security.

- Ensure car doors are locked whenever the car is not in use, even at home.

- Consider securing your electricity supply meter box with an approved lock.

- Keep ladders and tools locked away in a garage, garden shed or under the house.
• Garden sheds and gates should be kept locked.
• Letter boxes should be big enough to meet your mail needs. Keep it locked and emptied by a trusted friend or neighbour when you are away.

2.3 Internal Security
• Access to your home can be gained through the roof, so attach hinges and a sliding bolt to the manhole if you are concerned.
• If watching TV, in the back yard or working with the vacuum cleaner or other noisy tools/equipment, keep external doors locked.

2.4 Other Tips
• When you purchase new electrical goods avoid leaving the empty packaging (unless crushed and tied) with your rubbish as this could alert potential burglars to your new acquisitions.
• Don't keep large amounts of cash in your house unless it is in a good quality safe. Consider using a safety deposit box at a bank for the storage of especially valuable items.
• Get to know your neighbours to enable a mutual spirit of assistance. Neighbours are the extra eyes observing events in a community which ultimately reduces crime when reported to police.
• See if there is a Neighbourhood Watch or Bush Watch group in your area and consider joining.

2.5 Property Inventory
• Use the property inventory recording sheet provided in the central pages of this booklet to compile a detailed inventory of all your property. Record the serial numbers, makes, models, colour, size and date of purchase of your property. Keep the inventory in a safe place such as a safe deposit box and make sure you update it when new items of property are obtained. In the unlikely event that you may lose your property you will need the list to give details to police or your insurance company.
Alternatively, if you have items of value or collections of any kind, such as stamps, medals, paintings it would be advisable to seek the services of a home inventory service to prepare a professional inventory.

2.6 Property Marking

- Marking your property clearly identifies you as the owner of the property and deters burglars because they will find it more difficult to dispose of the goods. Having your property marked will also assist police to return it to you if it is stolen and subsequently recovered.
- Mark all of the items included on your inventory using engravers, data dots, and UV blue light pens or similar. Some of these items are available on loan from your nearest Neighbourhood Watch group.
- Not all items are suitable for engraving or marking. These items should be photographed or videotaped, with a ruler or matchbox beside them to assist in determining size. Items such as jewellery, watches, silverware, collectables, stamp and coin collections, furs, antiques, paintings and furniture come into this category.
- Mark your property with your driver licence number, preceded by the letter ‘T’ (for Tasmania). This will enable your property to be traced, even in another state. If you don’t have a driver licence, use the driver licence number of a relative or close friend.
- Alternatively, mark your property with a code comprising your initials, date of birth, and the letter ‘T’ (for Tasmania). For example: John Richard Smith. Date of birth: 01/02/65. His personal code is JRS01O265T.
- If you have any of your marked property stolen, make sure that you tell Tasmania Police the code you have used.
- Stickers are available from Neighbourhood Watch to indicate that your property has been marked for police identification. Display these stickers in a prominent position.
2.7 Home Security Assessment Checklist  (✓ if OK)

☐ House number clearly visible from the street, even at night
☐ Doors and windows clearly visible from the street
☐ Automatic light timers installed internally.
☐ Sensor-activated lights installed externally
☐ All darkened areas around the house able to be illuminated
☐ Lights left on when you go out
☐ All external doors solid core
☐ Quality security doors installed at all external entrances
☐ All external doors fitted with deadlocks
☐ All windows fitted with locks
☐ Door and window locks keyed alike
☐ Front entrance door fitted with wide-angle viewer or peep hole and safety chain
☐ Keys not hidden outside
☐ Sliding doors and windows unable to be lifted off their tracks
☐ Louvre windows fitted with bars or grilles
☐ Property engraved and valuable property photographed
☐ Property inventory list compiled and kept in a secure place, preferably away from the home
☐ Meter box locked
☐ All gates secured
☐ Boundary fences in good repair
☐ Garage/garden shed locked when not in use
☐ Garden tools locked away when not in use
☐ Dog on duty
☐ Security alarm installed, used and serviced regularly (including battery change)
☐ Ceiling access hole (manhole) fitted with hinges and sliding pad bolt
☐ Flue or chimney swept each year.
3.1 Actions to be taken

A house left empty for some time is a prime target for intruders because the chances are they will not be disturbed and any offence will go undetected for days, perhaps weeks.

When you go on holiday it is important that you do not leave behind any clues that will tempt an intruder.

By taking the following actions you will reduce the chance of your house being broken into while you are away.
3.2 Holiday Security Checklist (✓ if OK)

☐ Doors, windows, garden shed and garage locked
☐ Milk and paper deliveries cancelled
☐ Arrangement made for mail/junk mail collection or redirection
☐ Arrangement made for lawn to be mowed and plants to be watered
☐ Arrangement made for wheelie bin to be brought in
☐ No messages left on answering machine or notes on doors
☐ Volume on telephone turned down so potential intruders can't hear it ringing
☐ Contact name and number left with trusted neighbour
☐ Contact name and number left with local police
☐ Automatic timer set to turn on lights/TV/radio
☐ Garden tools, ladder, wheelie bin locked away
☐ Inexpensive laundry items left on the clothesline
☐ Key left with a trusted neighbour and not concealed outside the house
☐ Arrangement made for blinds to be re-arranged occasionally
☐ Arrangement made for a trusted friend to ‘house sit’
☐ Small valuables locked away securely
☐ Electricity supply to electronic garage doors disconnected
☐ Arrangement made for a neighbour to park their car in the driveway.
4.1 General Strategies

- Be careful who you let into your home
- Install a peep hole, a door chain or good-quality, well-fitted security door
- Always check the credentials of any callers
- Talk to all callers through a locked security door
- Good lighting at entrances is necessary for night-time identification
- If you live alone, don’t advertise the fact. Use only your surname on flat or unit directories; initial and surname in telephone directory; don’t give any of your contact details to unknown callers at the door or by phone
- Keep, police, ambulance, relatives’ and your doctor’s telephone numbers written in large type next to your phones
- If you own a touch phone, key in your emergency phone numbers
- If possible have a phone extension in your bedroom
- Have regular contact with someone you trust
- If you suspect an intruder is inside, **DO NOT ENTER THE HOUSE**; go to a neighbour’s house and call the police (000).
If you find an intruder on your property
• Activate the security systems / burglar alarm
• Get to the nearest phone (perhaps in the bedroom) and call the police
• Some security systems have a hand held ‘panic’ device to set off the alarm
• Try yelling “Fire!” to deter the intruder and attract someone’s attention.
• Install a large format phone if you have visual problems.

4.2 Safety Inside the Home
If you have any concerns about safety in and outside your home, contact:
• Your local Community Health Centre and/or GP for a referral to an occupational therapist who can visit your home and give advice. Check the local telephone directory for contact numbers
• The Independent Living Centre, 46 Canning Street, Launceston Telephone 1300 651 166 or web site www.ilctas.asn.au
• The Master Builders Association for their Home Modification Booklet Telephone (03) 6234 3810 or web site www.mbatas.org.au
Electrical/Lighting

- Ensure sufficient lighting is available
- Ensure light switches are easy to reach and near doorways
- Keep a torch readily available
- Have power points placed where they are easy to reach
- Use a power board rather than a double adaptor
- Avoid using extension cords
- Fit a device to keep your hot water system at a safe temperature
- Wear appropriate safety equipment if using power tools.
Bathroom

- Use grab rails in the toilet and bathroom
- Use a slip-resistant rubber mat in the bath or in the shower
- Consider altering the shower access
- Consider swinging the bathroom and toilet doors outwards.
General

- Position the telephone where it is easy to reach
- Attach non-slip adhesive strips to any steps
- Remove any loose mats particularly from polished floors
- Install smoke alarms in all bedrooms and between kitchen and bedrooms
- Ensure your stepladder is sturdy and in good condition.
4.3 Safety Outside the Home

- Keep trees in front of windows well trimmed
- Make sure that steps, paths and entrances are lit well
- Ensure steps and pathways are clear and free of leaves; spray moss, fungi and lichen
- Mark the leading edge of outside steps
- Paint slippery paths with a non-slip paint or by roughing the concrete
- Install rounded hand rails, no more than 40mm in diameter, near steps and stairs;
- Keep paths, paving and steps in good repair
- Keep garden tools and equipment safely stored when not in use
- Ensure landscaping materials such as gravel, river pebbles and woodchips are confined to garden beds.
4.4 Personal Safety Strategy Checklist (✓ if OK)

☐ Check the credentials of any callers; do not allow inside your home
☐ Direct callers wanting to use a telephone to the nearest public phone
☐ Use only surname and initial in phone book; surname on unit or flat
☐ Don’t provide personal information to unknown callers
☐ Hang up on nuisance calls
☐ Have emergency telephone numbers keyed into the telephone
  or large print list next to the telephone
☐ Have an extension telephone in the bedroom
☐ Have a strategy that informs neighbours / friends that you are OK
☐ Know what to do if an intruder is on the property or in the house.

4.5 Home Safety Checklist (✓ if OK)

**Electrical**

☐ Torch available for use in an emergency
☐ Torch batteries OK
☐ Sufficient lighting in all rooms and hallways
☐ Light switches easy to reach, (near doorways and at the top
  and bottom of stairs)
☐ Smoke alarms in all bedrooms or between kitchen
  and sleeping accommodation
☐ Batteries changed regularly in the smoke alarms
☐ Clothes and other combustibles never left near heaters
☐ All electrical cords in good condition
☐ Power points easy to reach
☐ Tempering system installed to your hot water system
☐ Power tools used correctly and safety equipment used.
**Modifications**

- Hand rails on both sides of stairs (inside and outside)
- Non-slip adhesive on steps with leading edge of step highlighted (inside and outside)
- Ceramic floor tiles treated to provide a slip-resistant surface
- Slip-resistant rubber mat or strips used in bath and shower
- Grab rails installed in bath, shower and toilet
- Bath seat and hand-held shower hose available
- Bathroom and toilet doors swing outwards
- Privacy locks on bathroom and toilet doors open from the outside
- Telephone easy to reach and use with second phone installed in bedroom with emergency numbers keyed in.

**Clean Up**

- Floors free of clutter
- Loose mats removed
- Frequently used items within easy reach
- Stepladder in good condition.

**Outside**

- Safety equipment used when working with chemicals
- Garden tools and equipment safely stored when not in use
- Landscaping materials confined to garden beds
- Paths, paving and steps not slippery and in good repair.
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Date Purchased</th>
<th>Engraved, Photographed or Videotaped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
**Property Inventory**

Use this checklist to record your valuables.

<table>
<thead>
<tr>
<th>Item of Value</th>
<th>Brand</th>
<th>Model Number</th>
<th>Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCR / DVD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Camera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer</td>
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<td></td>
</tr>
<tr>
<td>Printer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musical Instruments</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Binoculars</td>
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<td></td>
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</tr>
<tr>
<td>Telescopes</td>
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</tr>
<tr>
<td>Stereo System</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CD Player</td>
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</tr>
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<td>Cassette Player</td>
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<td></td>
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<tr>
<td>Walkman</td>
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</tr>
<tr>
<td>Camera Equipment</td>
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</tr>
<tr>
<td>Sporting Goods</td>
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</tr>
<tr>
<td>Kitchen Appliances</td>
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</tr>
<tr>
<td>Power Tools</td>
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<tr>
<td>Garden Tools</td>
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</tr>
<tr>
<td>Bicycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iPod</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Phone</td>
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<tr>
<td>Set Top Box</td>
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Use this checklist to record your valuables.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Date Purchased</th>
<th>Engraved, Photographed or Videotaped</th>
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<tr>
<td>Television</td>
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<td>VCR / DVD</td>
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<td>Video Camera</td>
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<td>Computer</td>
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<td>Printer</td>
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<td>Musical Instruments</td>
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<td>Binoculars</td>
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<td>Telescopes</td>
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<td>Stereo System</td>
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<td>CD Player</td>
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<td>Cassette Player</td>
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<td>Walkman</td>
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<td>Camera Equipment</td>
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<tr>
<td>Sporting Goods</td>
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<td>Kitchen Appliances</td>
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<td>Power Tools</td>
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<td>Garden Tools</td>
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<td>iPod</td>
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<td>Set Top Box</td>
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**Property Inventory**

Use this checklist to record your valuables.

<table>
<thead>
<tr>
<th>Item of Value</th>
<th>Brand</th>
<th>Model Number</th>
<th>Serial Number</th>
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Part 5 | Personal Safety in the Community

Feeling confident and safe when you are out in the street, in a car or on public transport will help you to maintain mobility and actively participate in community life and recreational activities. This section covers a range of strategies that will help to make every outing enjoyable and safe. Trust your instincts and do what makes you feel safe.

5.1 Auto-Teller Machines (ATM)

- Be aware of people around you. Stand where you have a good view of others and can observe if anyone is watching you make a transaction.
- Never count your money in public – this presents an opportunity for a thief. If you are concerned about someone watching you, place your body in front of the machine to stop anyone watching as you enter your PIN (personal identification number).
- Never let anyone see your PIN.
- Never write your PIN number down; memorise it or if you must write it down; then disguise it (e.g. by mixing your PIN with a set of other numbers).
- At night, choose a machine located under good lighting.
5.2 Driving Tips:

- If you are going somewhere unfamiliar, plan your route
- When possible, avoid travelling on isolated roads or in peak-hour traffic
- Maintain the condition of your car and get it serviced regularly. Ensure you have plenty of petrol and your fuel gauge is reliable. Regularly check that all tyres, including the spare, are properly inflated an know who to contact if your car breaks down. Advise someone of your estimated time of arrival and your destination and route particularly when going on long trips
- Ensure maximum visibility by:
  - keeping windows clean, clear and demisted
  - wearing sunglasses in bright sunshine
  - having your eyes checked regularly.
- Take a break every hour on long trips
- Park your car in well-lit areas and do not leave valuables inside; never leave mail or other documentation with your name and address visible in the vehicle
- Before you get in, check to make sure that no one is in your vehicle or loitering nearby
- At night, always try to park in well-lit public areas close to your destination
- If you ever become concerned when driving about the actions or behaviour of another driver you should contact police or drive to the nearest police station
- Fitting of vehicle immobilisers is a very effective way of protecting older vehicles (pre 1999). At times local councils have assisted with the cost of installing vehicle immobilisers. Contact your local council for further information.
5.3 Handbag Security

- Regularly review the actual contents of handbags. Do not carry large amounts of cash or other valuables unless absolutely necessary. Handbags should be worn rather than “carried” for increased security.
- Never leave your bag in a shopping trolley as it can easily be taken. Even a brief moment of distraction is enough for a thief to take an unattended bag. At the movies or a restaurant never leave your bag on a vacant seat next to you.
- When walking, wear your handbag or carry so that it cannot be easily reached or snatched. Remember that an easy target it is more attractive to a thief. Carry your bag on the side furthest from the road and never let the strap hang loosely.
- Consider maintaining a low credit card limit to avoid a large theft if your card is lost or stolen.
- Over the shoulder style handbags can be worn over the head with the purse to one side of the front of you.
- Always keep a separate record of information contained within your bag such as a driver’s licence, credit card numbers, passport and Medicare card.
- Never leave your bag unattended in a public place.
- If you are confronted by someone who is trying to take your bag, GIVE THE BAG TO HIM OR HER. This will undoubtedly go against all your instincts, but remember that no amount of money or inconvenience is worth personal injury. At the same time, take note of the appearance of the person and, if a vehicle is involved, take note of its registration number, make and colour and CALL THE POLICE on 000.
5.4 Out and About

Before Leaving Home:
• Plan your outing – to avoid busy traffic times if possible, and to prevent long waits at bus stops
• Take time to lock up carefully.

When Out:
• Always carry your mobile phone or change for a phone call or a phone card
• Always carry some form of identification
• Never carry a wallet in a back pocket, especially in crowded places
• Carry only the money you need and pay large bills by cheque or by phone using a credit card
• Never leave valuables unattended.
When Walking:

- At night use busy, well lit streets. If it is necessary to use poorly lit streets, walk as far from doorways as possible. Walk facing the flow of traffic.

- Avoid short cuts through parks or vacant lots, especially at night.

- Be cautious of people asking directions. Do not carry on a conversation with them.

- Cross roads at safe spots, such as pedestrian crossings and traffic lights.

- If it is necessary to cross at other places:
  - ensure you have enough time to cross the road;
  - wait on the median strip if you are unable to cross the whole road in one attempt;
  - look carefully in all directions for vehicles before and as you cross the road; and
  - do not assume that a driver has seen you.

- If you think you are being followed, or feel at all threatened:
  - cross the street;
  - try to get the attention of people nearby – shout as loudly as you can (‘Help!’,’Fire!’);
  - seek help at the nearest house, business, or busy public place; and
  - approach a Safety House or business. Make sure you know where they are located in your area.
5.5 Public Transport

Public transport is generally very safe. A few tips include:

• Be aware of bus timetables to reduce waiting times
• When waiting at a bus stop, stand with other people, if possible in well lit areas whenever possible
• If the bus is empty, or nearly empty, sit close to the driver
• If you feel concerned about alighting from the bus, alert the driver
• If you use taxis, remember that you are entitled to sit where you feel comfortable, in either the back or front seat of the vehicle
• The taxi driver is obliged to take you via the shortest route to your destination unless you advise or specify otherwise.
5.6 Telephone Safety

Public telephones:
- Position yourself so that you can easily see people approaching the phone box
- Once you have dialled your number, turn around to ensure you are aware of anyone approaching. This prevents any element of surprise.

Home telephone:
- Be very cautious of giving any personal information.

Mobile telephone:
- Always keep your mobile telephone out of sight when it is not in use
- Make sure that your personal identification number (PIN) is activated
- Activate the phone’s security code number
- Notify your service provider immediately if your phone is stolen or lost.
5.7 Safety Away from Home

Strategy Checklist

☐ Sit near the bus driver
☐ When returning home in a taxi, have the driver wait until you are safely inside
☐ Avoid driving on isolated roads or in peak hour traffic
☐ Plan outings
☐ Lock premises
☐ When walking, avoid short-cuts
☐ When walking, cross roads at safe places. If you are followed or confronted when walking, have a strategy for action
☐ When walking, carry change for a phone call (or carry a phone card or a mobile phone)
☐ When walking, carry some form of identification
☐ Know the location of Safety Houses in your local area
☐ When shopping, have an appropriate strategy for keeping handbag or wallet secure
☐ Use electronic banking facilities
☐ Check your surroundings when using an ATM
☐ Know the bus timetable
☐ Stand with other people at the bus stop
☐ Keep your car in good condition
☐ Park your car in well-lit areas
☐ Don’t leave valuables in a parked car
☐ Check to make sure no one is in the car before getting in
☐ Never pick up hitchhikers
☐ Take a break every hour on long trips
☐ Carry a personal security device
☐ Be aware of safety near public phones.
6.1 Collections for Charities

In Tasmania, laws apply to any person who solicits money for a charitable purpose from the public:

- Collectors must wear identity cards showing their name, their organisation and the location of the principal office
- Collectors can telephone residential numbers to collect donations only between 9am and 8pm
- Children under the age of 15 years must be under the immediate control and/or supervision of an adult.

Further detail is available from Consumer Affairs and Fair Trading on 1300 654 499.
6.2 Direct Selling

The direct selling of goods is governed in Tasmania by the *Door-to-Door Trading Act 1986*:

- If goods or services are purchased from a door-to-door salesperson, legislation provides a cooling-off period which allows ten days for a person to consider the purchase. The goods or services sold must be of the value of $50 or more.
- **NEVER** provide details of credit cards or other financial information to unknown callers.

The Consumer Affairs and Fair Trading provide a checklist for door-to-door sales. To ensure the salesperson has complied with the legislation you should consider carefully the points listed on the following:

**Checklist**

Did the salesperson:

- [ ] introduce themselves by name?
- [ ] give the name of the business?
- [ ] tell you what they are selling?
- [ ] tell you how to cancel the contract?
- [ ] inform you that work cannot begin or money change hands before the cooling-off period has expired?
- [ ] give you a chance to decide for yourself?
- [ ] help you and not use any pressure to encourage you to sign the contract?

If the answer to any question is no, it is important that you contact Consumer Affairs and Fair Trading on their Consumer Advice Line 1300 654 499.

Further information on this subject and many others, is available from Consumer Affairs and Fair Trading on their web site: www.consumer.tas.gov.au

6.3 Driver Education

Driving is important to all of us and important to independence and lifestyle. It is important to keep up-to-date with current road rules and regulations and to be aware of driver responsibilities. If you have any health concerns see your doctor.
The Department of Infrastructure, Energy and Resources (DIER) produces road safety booklets on driver awareness and these publications are good sources of information to keep you up-to-date. They also provide presentations to seniors groups. The DIER web site is www.transport.tas.gov.au or by telephone on 1300 851 225.

The RACT is useful source of additional information. They prepare a number of pamphlets providing safety tips for motorists. Phone 132 722 or visit their web site: www.ract.com.au.

6.4 Family Violence (including Elder Abuse)

We all have the right to live in a safe environment. If you, or someone you know is experiencing some form of abuse or violence within the home or a care situation it is important that you inform the police, 131 444.

Elder abuse refers to abuse inflicted on older persons. The abuse may be physical, psychological, sexual, financial or material, or result from neglect. People known to the victim commit most assaults committed in Australia.

Information is available from the Family Violence Hotline, 1800 200 526. Aged and Community Services Tasmania is an industry representative body that can also provide further information, (03) 6223 5100.

6.5 Fire Safety

The Tasmanian Fire Service (TFS) produce informative booklets including Fire Safety at Home and House Fire Prevent & Survive. These publications are available together with information on other programs mentioned below, by Freecall 1800 000 699.

TFS has a program called Project Wake Up.

This program is aimed at improving fire safety within the homes of the elderly and people with a disability. This is achieved by providing a free home fire safety check and the installation of free smoke alarms when required.

It is also important to remember, smoke alarms, regardless of their type only have a life of ten years and must be replaced at the end of this period.
6.6 Identity Fraud

Identity fraud refers to a person creating a new identity or taking the identity of another person. Identity information can be obtained from documents such as driver licence, accounts (e.g. Aurora) and bank statements. These documents are then used to open bank or store accounts in your name or obtain items such as credit cards and even passports. This action may see expensive items purchased in your name with the cost charged to you.

You can take these steps to minimise the risk:

- Don’t give out personal information on the telephone, through the mail or on the internet unless you’ve initiated the contact and you are sure who you are communicating with.
- Identity thieves are clever and will pose as representatives of banks or financial institutions and even government agencies.
- Ask about security measures in place at your workplace or business premises such as your doctor’s surgery. Find out who has access to your information.
- It is not uncommon for thieves to pick through your garbage or recycling bins to gain your personal information. All documentation that contains personal information should be shredded or at the least, torn up before careful disposal. Documents such as bank statements, credit card statements, insurance forms and credit applications and expired credit/charge cards are likely targets.
- Carry only the cards that you need when you go out.
- Be very cautious when responding to promotions as these may be scams to gain your personal details.
- Always keep your personal documentation safe and never leave it where others may gain access.
- Be alert to scams circulating via the internet and telephone.

Take great care in disposing of rubbish. Consider shredding documents containing credit card numbers.

If you suspect that you have become a victim of identity fraud you should report the matter, first to police by phone 131 444 and then if necessary to the Australian High Tech Crime Centre (AHTCC) phone (02) 6246 2101.

A kit has been produced by the Commonwealth Attorney General’s Department to assist in the prevention of identity theft. This, is available at...
6.7 Medications

Keep an up-to-date list of medications including:

- The name of each medicine
- Your daily dosage
- Where you keep your medication.

A Medicines Line operates Monday to Friday between 9a and 6pm with advice or assistance about medications and their effects. The number is 1300 888 763.

Further information is available from:
National Prescribing Service Telephone (02) 8217 8700 or www.nps.org.au,
orThe Pharmacy Guild of Australia Telephone (03) 6220 2955.

You may also consider displaying an emergency medical information booklet in your home. These are distributed by Rotary clubs or by telephoning the Rotary Information Line (03) 6229 9830.

6.8 Nuisance Calls

Some telephone service providers offer services to their customers who are receiving unwanted calls. Contact your telephone provider for more information.

Recently the Australian Government introduced legislation to establish a national DO NOT CALL REGISTER from 2007. This register is being created to protect consumers from telemarketing.

The legislation also establishes national minimum contact standards. These standards cover permitted calling hours, minimum information requirements and termination of calls. These standards apply to all telemarketers including specified public interest bodies with exemptions from the register.
6.9 Power of Attorney/Guardianship

Individuals may grant to spouses, carers, close friends or relatives the right to make decisions on health, personal or financial decisions on their behalf.

It is advisable to consult with your solicitor, a Trustee company or the Guardianship and Administration Board to make this decision.

Telephone: Public Trustee 1800 068 784 or web site www.publictrustee.tas.gov.au or the Guardianship and Administration Board (03) 6233 3085.

6.10 Scams

Scams cheat people out of their money. These ‘rorts’ or ‘rip-offs’ come in many forms or disguises such as emails asking you to verify your bank details; or a letter or email asking for your help in transferring money out of another country. These scams may also take the form of a phone call with an offer too good to refuse. Always ask the question, “If it sounds so good then why are they offering it to me?”

The best advice in dealing with these matters comes from Consumer Affairs and Fair Trading who recommend:

- Delete the email
- Destroy the letter
- Hang up the phone.

More information is available from ‘The Little Black Book of Scams; A Consumer’s Guide to Scams, Swindles, Rorts and Rip Offs’ Published by the Dept of the Treasury, Langton Crescent, Parkes, ACT 2600.
Part 7 | Referral Services

7.1 Advocacy Tas Inc.
This organisation supports and provides information to empower and
uphold the rights and interests of older persons, people with a disability or
mental illness.
Advocacy Tas may be contacted by telephone (03) 6224 2240 or web site

7.2 Building Alterations
Any building alterations or modifications must comply with local council
regulations. When investigating reputable building contractors or trades
people contact the Masters Builders Association (03) 6234 3810 or the
Housing Industry Authority (03) 6230 4600.

7.3 Crime Prevention Groups
Neighbourhood Watch (NHW):
NHW operates throughout Tasmania within local communities. NHW groups
are able to supply crime prevention and community safety advice.
Further information is available from Tasmania Police (03) 6230 2178 or the
web site: www.nhwtas.org.au or the information line 1300 139 138.

Bush Watch:
Bush Watch is a community based crime prevention initiative aimed at the
detection and prevention of offences both on public and private land within
rural and remote areas.
Further information is available from Tasmania Police (03) 6230 2178 of the

Safety Houses:
Safety Houses are located state-wide.
Safety Houses can be both private homes and businesses where children,
teenagers and adults of all ages can seek assistance when and if they feel
frightened or threatened.
When someone approaches a Safety House and asks for assistance the householder or business person will notify police immediately and request police attendance or advice.

Further information and details on joining the scheme is available from:

Safety House Association of Tasmania Inc
PO Box 542
Glenorchy Tas 7010
Tel/Fax (03) 6272 2606
Email: safetyhousetas@bigpond.com

“Feeling unsafe, knock on a Safety House door”

7.4 Legal Aid

The Legal Aid Commission of Tasmania provides legal advice to individuals who qualify under their criteria. Further information may be obtained by telephoning 1300 366 611 or their website: www.legalaid.tas.gov.au

7.5 Lifeline

Lifeline provides listeners who are available day and night for people who experience emotional distress and despair. This organisation also provides a Victims of Crime Service. They may be contacted on 131 114 or web site www.lifeline.org.au/hobart.

7.6 Local Councils – Footpath Obstructions

Damaged or uneven footpaths and bushes growing to obstruct your path are often of concern. These matters should be referred to your local council.

7.7 Red Cross Service

Australian Red Cross provides the following services for older people:

Telecross Service:

This is a service for people who live alone and are older, have a disability or suffer from illness. Telecross provides a friendly early morning telephone call. The person requiring the service, concerned relatives or friends, medical practitioners or health workers may make referrals.
Emergency Home Alert Service:
The Emergency Home Alert Service is designed for people who live alone or with a frail partner and who may be at risk of accident or sudden illness due to advanced age, ill health or disability. A small personal pendant links to an alarm unit that is monitored 24 hrs a day.

For further information on these services Free Call 1800 246 850.

7.8 Tenancy

For information on any tenancy issue contact the Tenants Union of Tasmania on 1300 652 641 or their website: www.tutas.org.au

7.9 Telephone Connections

Some telephone providers offer programs to help pensioners, the unemployed and people with a disability to access telephone services.

Further information is available from your telephone service provider.
Part 8 | Other Publications

Aged & Community Services – Australia (03 6223 5100)
Publication Confronting Elder Abuse

Australian Red Cross (1800 246 850)
Pamphlets on alarms for emergency service

Australian Securities and Investment Commission (02 6250 3850)
Articles on Scams and Swindlers
Nigerian Scams
The Little Black Book of Scams

Commonwealth Attorney Generals’ Department (02 6250 6711)
Publication Crime Prevention for Seniors

Consumer Affairs and Fair Trading (1300 654 499)
Pamphlet on scams
Fact sheets on consumer issues

Department of Infrastructure, Energy and Resources (DIER) (1300 851 225)
Publication Older Drivers Handbook

Internet Industry Association (02 6232 6900)
Pamphlet Avoiding ID and Computer Fraud

RACT (132 722)
Pamphlet Personal Safety Tips for Motorists

The Tasmanian Fire Service (1800 000 699)
Project Wake Up
Fire Safety at Home
Preventing and Surviving a House Fire
Pamphlet Personal Safety Tips for Motorists
Publication Older Drivers Handbook
9 | Acknowledgements

Thank you to the following agencies for assistance in the preparation of this handbook:

- Aged & Rural Community Health
  (Department of Health and Human Services)
- Council on the Ageing
- Crime Prevention and Community Safety Council
- Hobart City Council
- Queensland & South Australian Police Services
- Tasmanian Community Fund
- Tasmania Police
- Others around the State who were involved in the consultation process.
Disclaimer

This booklet has been prepared by the Crown and Council on the Ageing as a community service. While every care has been taken in its preparation to provide sound advice, the handbook should not be used as a substitute for professional security advice.

The Crown in Right of the State of Tasmania together with Council on the Ageing, their servants and agents will not be held liable for any loss or damage, however so arising, from use of or reliance on the information contained in this handbook.
Appendix F: Cognitive Activity Group Telephone Booster

Interview and Activities
PACE TELEPHONE BOOSTER SESSION: COGNITIVE ACTIVITY GROUP

1. Review general well being

2. How has your health been?
   a. Have you had any admissions to hospital over the last six months? Obtain details.
   b. Do you have any planned operations coming up? Obtain details.
   c. Has there been any change in your medications? Obtain details

3. Enquire as to how their memory has been:
   a. Is there anything in particular you are having trouble with?
   b. Have you used the strategies outlined in your folder to help you (either with a problem they had noticed or in a more general sense)?
   c. Have you made any changes to your lifestyle/level of activity since completing the program?
   d. Is there any information/content within your folder that you would like to review or need copies of?
4. Review material sent in the post:
   a. How did you go completing the activities I sent you in the mail? Was there anything in particular that you had difficulty with?

   b. How long did it take you to work through all of them?

   c. Did you review the summary sheet of information we covered in the program?

      i. Let’s go over that information together now.
Review of Sessions Two and Three: The Roles of Attention, Processing Speed and Executive Functions

- Problems with memory may actually be due to problems with attention. Strategies to improve attention include:
  - Minimising fatigue
  - Minimising distraction
  - Reducing competing demands (ie. Avoid multi-tasking)
  - Being organised

- As we get older, it becomes harder to process information at the same pace as we once did. Strategies to cope with reduced processing speed include:
  - Reducing time pressures – plan ahead so you won’t have to rush
  - Ask questions to slow down the rate of presented information and to afford extra time to process the material
  - Practice

- Executive functions can also influence memory and these include a range of abilities such as planning, organisation and strategy use. Improving memory through this aspect of our cognition can be achieved by:
  - Being well organised in our environments
    - Using diaries, calendars, wall charts and white boards
    - Creating lists and writing things down
    - Completing activities straight away
    - Utilising routines
    - Having set places for things
    - Creating a memory notebook

- Other factors which can also impact on memory include:
  - Psychological factors
    - Depression, grief, anxiety, stress
    - Negative attitudes
    - A lack of mental stimulation
  - Health issues
    - Physical illness and medical conditions
    - Medications
    - Sensory losses
    - Fatigue
    - Alcohol
    - Poor nutrition
Reviewing Memory Processes: Sessions Four to Seven

- Working Memory or Short Term Memory is a temporary memory store. It is the small amount of information that can be held in the mind at any given moment.

- Long Term Memory is the memory bank. It is the largest component of the memory system and its storage space is practically limitless. It refers to any information that is no longer in conscious thought but is stored for potential recollection at a later stage.

- In order to successfully remember something you need to:
  - Encode, store and retrieve the details
    - Encoding involves paying attention, associating, analysing and elaborating on the details. Strategies to assist in learning new information include Visualisation, Association and Repetition/Rehearsal.
      1. Visualisation is the process of consciously creating an image in your mind of a task, number, a name, a word or a thought.
      2. Association is the process of forming mental connections between what you want to remember and what you already know.
      3. Repetition/Rehearsal requires you consciously going over the information a number of times.
  - Retrieval is accomplished by using recognition or spontaneous recall

Reviewing Language Abilities: Session 8

- The Tip of the Tongue Phenomenon is the experience whereby you know the word you are looking for but have difficulty retrieving it.
  - This problem can be managed by:
    - Relaxing and being patient
    - Thinking of similarly related information
    - Practice
    - Developing a word list
5. Remind them of their 12 month follow-up assessment
   a. You will be contacted in __________ so that we can organise your follow-up testing. At that appointment you will be seeing__________.

   b. Do you have any plans to move home or travel during this time that you are aware of? (If so, ask permission for the contact details of a close friend or relative in case we have difficulty contacting them).
Dear Mrs. X

Thank you for your continued participation in the PACE study.

Please find enclosed your “booster” session activity pack which includes:

1) A summary sheet which briefly reviews the material covered in the five week program that you participated in.

2) An activity pack containing exercises similar to those completed in the program.

3) A reply paid envelope.

Instructions for Booster Session

· Firstly, I would like you to spend some time reading over the summary sheet. This will help to “boost” your memory for some of the information that was presented in the program.

· Once you have read the summary sheet, I would like you to complete the activities which have been stapled together in a booklet and sealed with clips. These exercises will refresh your memory for some of the tasks we completed in the sessions. **DO NOT LOOK AT THESE ACTIVITIES UNTIL YOU ARE READY TO BEGIN THE EXERCISES.**

· After completing the activities, please place the booklet in the envelope provided and post it. The summary sheet is yours to keep and store in your manual.

In approximately one week, I will contact you by telephone to discuss the activities and to ask about your memory and well being since the program. This telephone call will take approximately twenty minutes. However, should you have any questions or concerns regarding your ongoing involvement in the PACE study, please do not hesitate to contact me on 9224 2855.

Best wishes
Review of Sessions Two and Three: The Roles of Attention, Processing Speed and Executive Functions

- Problems with memory may actually be due to problems with attention. Strategies to improve attention include:
  - Minimising fatigue
  - Minimising distraction
  - Reducing competing demands (ie. Avoid multi-tasking)
  - Being organised

- As we get older, it becomes harder to process information at the same pace as we once did. Strategies to cope with reduced processing speed include:
  - Reducing time pressures – plan ahead so you won’t have to rush
  - Ask questions to slow down the rate of presented information and to afford extra time to process the material
  - Practice

- Executive functions can also influence memory and these include a range of abilities such as planning, organisation and strategy use. Improving memory through this aspect of our cognition can be achieved by:
  - Being well organised in our environments
    - Using diaries, calendars, wall charts and white boards
    - Creating lists and writing things down
    - Completing activities straight away
    - Utilising routines
    - Having set places for things
    - Creating a memory notebook

- Other factors which can also impact on memory include:
  - Psychological factors
    - Depression, grief, anxiety, stress
    - Negative attitudes
    - A lack of mental stimulation
  - Health issues
    - Physical illness and medical conditions
    - Medications
    - Sensory losses
    - Fatigue
    - Alcohol
    - Poor nutrition
Reviewing Memory Processes: Sessions Four to Seven

- Working Memory or Short Term Memory is a temporary memory store. It is the small amount of information that can be held in the mind at any given moment.

- Long Term Memory is the memory bank. It is the largest component of the memory system and its storage space is practically limitless. It refers to any information that is no longer in conscious thought but is stored for potential recollection at a later stage.

- In order to successfully remember something you need to:
  - Encode, store and retrieve the details
    - Encoding involves paying attention, associating, analysing and elaborating on the details. Strategies to assist in learning new information include Visualisation, Association and Repetition/Rehearsal.
      1. Visualisation is the process of consciously creating an image in your mind of a task, number, a name, a word or a thought.
      2. Association is the process of forming mental connections between what you want to remember and what you already know.
      3. Repetition/Rehearsal requires you consciously going over the information a number of times.
    - Retrieval is accomplished by using recognition or spontaneous recall

Reviewing Language Abilities: Session 8

- The Tip of the Tongue Phenomenon is the experience whereby you know the word you are looking for but have difficulty retrieving it.
  - This problem can be managed by:
    - Relaxing and being patient
    - Thinking of similarly related information
    - Practice
    - Developing a word list
Dear PACE participant

The following pages consist of part of your “Booster Session”. We would like you to try to complete the enclosed activities as best you can and on your own.

Please begin on page 2 and continually work your way through, without stopping or skipping any activities, until you complete the last activity on page 17. **Do not look at the pages in advance**: remove the clip only when you are ready to begin the exercises.

In order to complete the activities you will need:

- To set aside approximately 15 to 20 minutes (it may take a little longer)
- A pencil or pen
- A clock or watch with a second or minute hand (as some of the activities are timed)

Record your start time and finish time in the spaces provided.

Once you have completed the activities, please place the booklet in the envelope supplied and place it in the mail. If you have any questions or concerns, please do not hesitate to contact me on 9224 2855.

I will be telephoning you shortly to complete the second component of the “Booster Session”.

Many thanks for your continued involvement in the PACE study.

Best wishes,

Mandy Vidovich

**START TIME: __________**
Draw a line to match the words and best definitions.

Multicoloured          BEE
Has four legs          FURNACE
A lover of honey       JELLY FISH
Kitchen appliance      HORSE
Flies in the sky       CALENDAR
See through            KITE
Can sting              RAINBOW
Hot                    TRANSPARENT
Stable animal          DOG
A record of time       STOVE
Lives in the ocean     BEAR
Study the list of words below for **two minutes**. You can remember them in any order that you like.

Think about the strategies that you learnt during the program.

After two minutes, move on to the next exercise.

Gold
Mango
Bus
Apple
Silver
Pear
Helicopter
Scooter
Aluminium
Put a line through all of the symbols that look like this: 

There are 20 of them.
As quickly as you can, put an X through every 6 on the page. There are 12 of them to locate.
A little while ago, you studied a list of words for two minutes.

How many words were there? Answer ________

List the words:
Write the words next to the correct definitions.

· USED TO CUT PAPER = CALCULATOR
· TOWED BEHIND A VEHICLE = TRAILOR
· A COLD PLACE = ANTARCTICA
· HAS A RED, GREEN OR YELLOW SKIN BUT WHITE FLESH = APPLE
· SLEEPS BY DAY PREYS BY NIGHT = VAMPIRE
· USED FOR MATHEMATICS = MAGIC
· A PIECE OF FURNITURE = SOFA
· A HORSE WITH STRIPES = ZEBRA
· THE OPPOSITE OF NORTH = SOUTH
· IS ALSO A DOG = MARTIN LUTHER KING JNR
· ONE WHO STUDIES THE WEATHER = METEOROLOGIST
· A WORK OF ART = STATUE
· HE HAD “A DREAM” = CANINE
· KEEPS THE TIME = WATCH
· IS NOT WHAT IT SEEMS = SCISSORS
BUILDING SUPPLIES

Wire
Aluminium
Concrete
Timber
Steel
Bricks
Mortar
Tin
Bamboo
Cement
Glue

Place the above words correctly in the crossword grid.
Put a line through all of the “9”s that are immediately followed by a “6”. Be sure not to miss any out. The first one is done for you.

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<thead>
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<th>10</th>
<th>1</th>
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<td>5</td>
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<td>6</td>
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<td>9</td>
</tr>
</tbody>
</table>
From your memory, and in the spaces below, write the 11 words that you placed in the crossword puzzle grid from the “Building Supplies” activity.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.
Using a pencil or pen, copy each of the figures below.
Study the list of word pairs (working across the page) for two minutes.

Think about the strategies that you learnt during the program.

After two minutes, move on to the next exercise.

<table>
<thead>
<tr>
<th>CAR</th>
<th>DARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT</td>
<td>POLE</td>
</tr>
<tr>
<td>GRILL</td>
<td>HOUSE</td>
</tr>
<tr>
<td>CHAIR</td>
<td>BANANA</td>
</tr>
<tr>
<td>NUT</td>
<td>PEN</td>
</tr>
<tr>
<td>COMPUTER</td>
<td>MAIL</td>
</tr>
<tr>
<td>TEA</td>
<td>WATER</td>
</tr>
</tbody>
</table>
From your memory, draw those four figures you copied earlier.
A little while ago, you studied a set of word pairs for two minutes.

Complete the pairs by filling in the blank spaces below:

____  DARK
____  POLE
GRILL  _____
____  BANANA
NUT  _____
COMPUTER  _____
____  WATER
Study the pairs of pictures for 30 seconds

[Image of pairs of pictures]
Complete these familiar phrases:

1. Don’t throw out _______ _______ with the bath ______
2. You get what you _______ ______
3. Better late than ______
4. Don’t _______ all your _______ in one basket
5. A picture tells a _______ ______
6. Every dog has his ______
7. Two wrongs don’t _______ _______ ______
8. Don’t _______ a gift _______ in the mouth
9. Easy _______ easy ______
10. Familiarity breeds ______
Write the names for each of the pairs of objects you studied earlier. Some have already been done for you.

1. Pencil & ______________
2. __________ & Flower
3. Telephone & __________
4. ________ & Flag
5. __________ & Clock

FINISH TIME: ________
Appendix G: Education Group Telephone Booster Interview
PACE TELEPHONE BOOSTER SESSION: EDUCATION GROUP

1. Review general well being

2. How has your health been?
   a. Have you had any admissions to hospital over the last six months? Obtain details.
   b. Do you have any planned operations coming up? Obtain details.
   c. Has there been any change in your medications? Obtain details

3. How has your memory been?

4. Have you altered any aspects of your lifestyle since the program?
   a. If yes, obtain details

5. Review use of the folder:
   a. Have you used the folder? If yes; what was most helpful?
   b. Would you like extra copies of any of the material?
   c. Was there any information in the folder that concerned/worried you, or that you didn’t understand?
   d. I’m going to recap some of the main points of each session with you now and I’d like you to follow along in your manuals.
Recap of Session One and Two

- You will recall that after our first session where we started to get to know each other, we moved on to talking about some of the issues that affect older adults.

- In Session Two: Memory and Dementia, we explored how memory changes and the difference between memory difficulties associated with normal ageing and more serious problems that might suggest the early signs of dementia.

- We watched a video presentation on Alzheimer’s disease which reviewed the symptoms of the disease. Some of the facts regarding AD included:
  - Alzheimer’s disease accounts for roughly 2/3 of dementia cases in Australia
  - It is characterised by abnormal pathology in the brain
  - The risk of developing AD increases if there is a 1st degree relative with the disease; Age is also a risk factor, particularly being aged 80 and older.

Recap of Session Three

- In Session Three, we explored the benefits of physical activity and the Australian Government Physical Activity Guidelines recommending 30 minutes of moderate intensity activity on most days of the week.

- We reviewed the potential benefits associated with being physically active which included reducing the risk of heart disease and high blood pressure, Falls and injuries, Obesity, Osteoporosis, Stroke and Depression. Being physically active was also associated with other benefits including increasing opportunities for socialisation and quality of life, improving sleep and reducing pain and stress.

- The other issue we touched on briefly in that session was nutrition. We watched a video that discussed important nutrition information relevant to older adults as well as reviewing ways for you to obtain more information about healthy eating.

Recap of Session Four

- Moving on to Session Four. This Session was devoted to the issue of stress, the causes, effects and management.

- We know that stress can have negative effects of sleeping patterns, cause muscle tension, aches and pains, can influence mood state and can also lead to problems with attention and concentration.

- In our discussion regarding the management of stress, we talked about the benefits of relaxation and also did a relaxation exercise.

Recap of Session Five

- Depression was the topic of Session Five. Again we explored the causes, effects and management of this condition. In particular we reviewed how symptoms of depression may manifest as behavioural, physical and thought changes.

- Depression is often managed with a combination of medications and counselling and lifestyle changes may also be implemented.
Recap of Session Six
· Sleep changes in older adults was the topic of Session Six.
· Changes to our sleeping habits occur naturally and normally with age, however there are a number of ways to manage sleep difficulties. These include the use of medication, lifestyle changes and monitoring of sleep patterns to identify potential causes.

Recap of Session Seven
· The title of Session Seven was “Older but not Old” and we looked at some of the ways of challenging the negative stereotypes associated with becoming older.
· We reviewed the issue of ageism in the workplace and also looked at older adults who have and are continuing to remain active and productive in the community well into what would be considered their “retirement years”.
· The second half of that session was devoted to the issue of volunteering. We talked about the benefits to the community, economy and individual from engaging in this form of activity. We also explored the different types of activities that people could volunteer for as well as ways of obtaining more information.

Recap of Session Eight
· In Session Eight we discussed an issue that affects all of us at some stage – retirement. We talked about the different implications that retirement might have, both positive and negative.
· We also talked about ways to enjoy retirement and different activities such as returning to study, travel and the health benefits of having a pet.

Recap of Session Nine
· As we get older, we may feel more vulnerable in our homes, particularly if living alone, and when we are out in the community. In session 9, we talked about fire safety and home security, as well as ways of enhancing your safety in the home and out in the street. I suggested that you contact your local fire department and/or police station for more detailed tips.
· The other matter we discussed was ensuring that important medical information is available to others, if there came a time when you had a medical emergency. This would greatly assist those involved in your care.
· In the latter half of this session, we also talked about planning for the future in terms of making a Will and the issues of power of attorney. The Office of the Public Trustee can further assist in dealing with questions relating to these issues.
6. Remind them of their 12 month follow-up assessment
   a. You will be contacted in ___________ so that we can organise your follow-up testing.
      At that appointment you will be seeing____________.

   b. Do you have any plans to move home or travel during this time that you are aware of?
      Obtain details and if so, ask permission for the contact details of a close friend or
      relative in case we have difficulty contacting them.
Dear Mr. X

Thank you for your continued participation in the PACE study.

You will recall that the next phase of the study, once you had completed the programs and follow-up testing, was to participate in a “booster” session. Shortly, I will be contacting you by telephone to ask about your memory and well being since having completed the program. This telephone call will take approximately twenty minutes and we will also spend some time reviewing the material covered in your program manual.

If you have any questions or concerns regarding your ongoing involvement in the PACE study, please do not hesitate to contact me on 9224 2855.

Best wishes
1. Recap of Session One and Two
   - You will recall that after our first session where we started to get to know each other, we moved on to talking about some of the issues that affect older adults.
   - In Session Two: Memory and Dementia, we explored how memory changes and the difference between memory difficulties associated with normal ageing and more serious problems that might suggest the early signs of dementia.
   - We watched a video presentation on Alzheimer’s disease which reviewed the symptoms of the disease. Some of the facts regarding AD included:
     - Alzheimer’s disease accounts for roughly 2/3 of dementia cases in Australia
     - It is characterised by abnormal pathology in the brain
     - The risk of developing AD increases if there is a 1st degree relative with the disease; Age is also a risk factor, particularly being aged 80 and older.
     - In order to be diagnosed with AD an individual needs to:
       - Demonstrate impairment in memory abilities as well as in another aspect of thinking such as language or in planning and organisation.
       - There needs to be evidence of decline.
       - The difficulties need to be severe enough to cause difficulty in the ability to undertake aspects of daily functioning such as managing aspects of the household or driving.
       - There must be no evidence of a clouding of consciousness or acute confusion at the time of the diagnosis.
       - Other reversible causes of cognitive difficulties also need to be ruled out such as depression, medical problems.

2. Recap of Session Three
   - In Session Three, we explored the benefits of physical activity and the Australian Government Physical Activity Guidelines recommending 30 minutes of moderate intensity activity on most days of the week.
   - We reviewed the potential benefits associated with being physically active which included reducing the risk of heart disease and high blood pressure, Falls and injuries, Obesity, Osteoporosis, Stroke and Depression. Being physically active was also associated with other benefits including increasing opportunities for socialisation and quality of life, improving sleep and reducing pain and stress.
   - The other issue we touched on briefly in that session was nutrition. We watched a video that discussed important nutrition information relevant to older adults as well as reviewing ways for you to obtain more information about healthy eating.

3. Recap of Session Four
   - Moving on to Session Four. This Session was devoted to the issue of stress, the causes, effects and management.
   - We know that stress can have negative effects of sleeping patterns, cause muscle tension, aches and pains, can influence mood state and can also lead to problems with attention and concentration.
   - In our discussion regarding the management of stress, we talked about the benefits of relaxation and also did a relaxation exercise.
4. **Recap of Session Five**
   · Depression was the topic of Session Five. Again we explored the causes, effects and management of this condition. In particular we reviewed how symptoms of depression may manifest as behavioural, physical and thought changes.
   · Depression is often managed with a combination of medications and counselling and lifestyle changes may also be implemented.

5. **Recap of Session Six**
   · Sleep changes in older adults was the topic of Session Six.
   · Changes to our sleeping habits occur naturally and normally with age, however there are a number of ways to manage sleep difficulties. These include the use of medication, lifestyle changes and monitoring of sleep patterns to identify potential causes.

6. **Recap of Session Seven**
   · The title of Session Seven was “Older but not Old” and we looked at some of the ways of challenging the negative stereotypes associated with becoming older.
   · We reviewed the issue of ageism in the workplace and also looked at older adults who have and are continuing to remain active and productive in the community well into what would be considered their “retirement years”.
   · The second half of that session was devoted to the issue of volunteering. We talked about the benefits to the community, economy and individual from engaging in this form of activity. We also explored the different types of activities that people could volunteer for as well as ways of obtaining more information.

7. **Recap of Session Eight**
   · In Session Eight we discussed an issue that affects all of us at some stage – retirement. We talked about the different implications that retirement might have, both positive and negative.
   · We also talked about ways to enjoy retirement and different activities such as returning to study, travel and the health benefits of having a pet.
8. **Recap of Session Nine**

- As we get older, we may feel more vulnerable in our homes, particularly if living alone, and when we are out in the community. In session 9, we talked about fire safety and home security, as well as ways of enhancing your safety in the home and out in the street. I suggested that you contact your local fire department and/or police station for more detailed tips.

- The other matter we discussed was ensuring that important medical information is available to others, if there came a time when you had a medical emergency. This would greatly assist those involved in your care.

- In the latter half of this session, we also talked about planning for the future in terms of making a Will and the issues of power of attorney. The Office of the Public Trustee can further assist in dealing with questions relating to these issues.
Appendix H: Cognitive Activity Group 12 Month Booster

Materials
PACE

BOOSTER SESSION
FOR COGNITIVE ACTIVITY GROUP
Welcome and Introduction
(Duration: 5 minutes)

- Welcome back and thank you for agreeing to continue to participate in the PACE study for a further 12 months. It’s lovely to see you all again.

- The purpose of today’s session is to provide you with a “booster session” which covers some of the areas relevant to the program you participated in approximately 12 months ago.

- We will be spending some time doing one final review of the topics previously covered.

- This session is going to run for one hour. Feel free to interrupt me at any stage if you would like to make a comment or ask a question.

- If at any time during this session you need to have a break or use the bathroom, feel free to leave the room. The toilets are located…(described depending on room running session in).

- Here are the topics we are going to be covering in the session:
  - Attention, Processing Speed and Executive Functions – Reviewing the cognitive influences on memory
  - Memory – The tricks of the trade
  - Language – Still stuck for words?
  - Take home messages

- Are there any questions before we start?
Attention, Processing Speed and Executive Functions: Your One Stop Shop
(Duration: 15 minutes)

- You will recall that as we get older there can be a number of changes that occur to our thinking.
- Problems with memory can actually be due to problems with attention, as we can begin to find it more difficult to attend to more than one thing at a time and distractions may disrupt our concentration more so.
- There are a number of different strategies that we can put in place to improve our attention and these include reducing distractions, focussing on one task at a time, and being mindful of the effects of fatigue.
- Another change that people will sometimes notice is that the rate with which they are able to process information can slow down and they may need longer to think about information and react to it. We can enhance our processing abilities by reducing time pressures, using repetition, asking questions and practicing activities that we aren’t familiar with.
- We are going to do some activities now which require us to use our attention and processing speed abilities.
  - Activities 1.1, 1.2 & 1.3

- During the sessions we also talked about executive functions. These are a range of abilities such as planning, organising, using strategies and developing routines. These abilities can also play an important role in our memory functioning. Remember “Those who fail to plan, plan to fail”; by being well organised in the way you undertake activities in your day, the more productive you will be with less opportunity for you to forget important things.
Memory: A crash course refresher  
(Duration 20 minutes)

- We also spent a lot of time in the sessions talking about how memory works. We learnt about the differences between short term memory and long term memory and that in order to remember something we need to go through these three steps:
  - Encoding
  - Storage
  - Retrieval

- Encoding is the process of getting information into memory. We firstly need to pay attention to something, we then associate it with information already known and also go through the steps of analysing the information for meaning and elaborating on the details. The more effort you put into encoding the greater likelihood of the memory being stored away. This will also influence your ability to retrieve the information when you need it at a later stage.

- Let’s try some memory tasks now. Think about the strategies that you learnt in the program. Make associations, links or connections, create visual images, repeat or rehearse the information to yourself.

- Activities 1.3, 1.4, 1.5

You will recall that I spent some time talking to you about the types of things you could be looking at in your home environment that can influence your memory functioning. Strategies for use in the home included things like:

- Write things down, but don’t rely on scrap bits of paper. Use diaries, calendars, wall charts, white boards etc. Keep these by the phone or in prominent places.
- Complete activities straight away, rather than putting them off and having to rely on memory later on. Keep a notebook handy. Keep a running commentary – say things out aloud as you are doing them eg. “I’m putting my glasses on the bedside table”.
- Write important questions down.
- Get into the habit of having routines for certain activities and keep objects in set places and always return items after you have finished using them. Reduce clutter.
- File all important documents straight away and have a designated draw that you keep this information in.
- Group Discussion: Who of you are still doing these things? Are there any areas of difficulty that you are still having trouble with?

- Let’s also not forget the Psychological and Health Factors that can also influence memory.
  - When we are upset it is hard to concentrate. You will recall that we have talked previously about the effects that depression, grief, anxiety and stress can have on the way memory functions. Negative attitudes and a lack of mental stimulation, social interaction and physical activity can also influence memory abilities.
  - In terms of health, physical illness, medical conditions and medications can cause reversible changes in memory functions. Sensory losses can influence the accuracy of the information you are trying to process to remember and fatigue, alcohol and nutrition can also play a role in memory abilities.
**Language:**
*(Duration: 15 minutes)*

“The right word may be effective, but no word was ever as effective as a rightly timed pause.”

**Mark Twain**

- In your initial program we also spent some time talking about language skills. This is one area of our cognition, or mental processes, that remains relatively preserved over time. Some subtle changes in the efficiency of our word retrieval can occur and this can result in the “tip of the tongue” phenomenon, whereby you know the word you are looking for, though it just won’t come to you. There are a number of strategies that we can put in place to try to manage with this problem.

- The next time you find yourself searching for a name/word try to relax, take a deep breath and think of related items. If you still can’t retrieve it, don’t worry, it will come at a later time, probably when you are thinking of something else.

- Try not to become impatient with yourself when the information doesn’t come to mind immediately.

- If there are specific words or terms you are trying to learn, start a list with the correct definitions. Keep this handy, for example in your memory book. Regularly refer to this and try to incorporate the words into your everyday conversation as much as possible. This will help you to remember them.

- You might also want to prepare ahead of time if you are going to be making a phone call and there are certain facts; names etc. that you might need to provide to the person on the other end of the line; write down important terms so that you can access the information immediately if you need to.

- Practice activities that challenge your word knowledge. Undertake crosswords of varying complexity; complete word puzzles and quizzes. Reading is another way to keep your vocabulary in check.

- Let’s try some activities now to challenge our word finding skills

- Activities 1.6, 1.7, 1.8
Closing Comments and Take Home Messages:
(Duration: 5 minutes)

- We have come to the end of our booster session. Does anyone have any questions?

- I’d like to thank you all for coming along today; I hope you have found it enjoyable and have been reminded of the topics and activities that we completed over 12 months ago when you first participated in the program.

- The next time you hear from the PACE team will be when we contact you to complete your final testing in approximately 12 months time. This assessment will be similar to what you have recently completed.

- During the next 12 months I would encourage you to review the program information you have been provided with over the course of your involvement in the study.

- Continue to try to use the strategies we have talked about in various aspects of your daily routine.

- Are there any comments before we finish up?

- Thank you once again and see you next year.
PACE ACTIVITIES FOR:
COGNITIVE BOOSTER SESSION
Activity 1.1

PLACE A LINE THROUGH EVERY LETTER ‘A’ THAT YOU SEE

SR T Q W S E A D A F G T H Y U J N B A O P L M K N A A D S E F C A
G T E A X Z B A N B A H Y U I O P S E A X Z V B N M T A E Y A U I O K
L M D S A E Q F T R U U H B V C X Z S A Q W E R T Y H G A W R T Y U
E S F S A A Q T Y U H G B D A F R T T H Y H U J F D C B N J H Y T E
Q A E W W S R T Q W S E A D A F G T H Y U J N B A O P L M K N A A D
A U I O K L M D S A E Q F T R U U H B V C X Z S A Q W E R T Y H G A
E T Y U T G H J C D S F C V B N M J H G F V T U I O P L K A Z X D E A
S C G G R D E S F S A A Q T Y U H G B D A F R T T H Y H U J F D C B

How many “A”s were there? __________________
Activity 1.2: CORRECTLY COMPLETE THE MAZE WITHOUT ANY ERRORS BY STARTING AT THE FROG AND ENDING AT THE PRINCE
Activity 1.3: PUT A LINE THROUGH ALL OF THE BOXES WITH A ‘1’ IN THEM.
THERE ARE FIFTEEN TO FIND
Activity 1.3a: Study the list of words below for two minutes. You can remember them in any order you like.

- Hammer
- Pineapple
- Belt
- Hat
- Banana
- Drill
- Wrench
- Lemon
- Trousers
Activity 1.3b:
Write down from your memory, in any order you like, all the words you can remember from the word list you just tried to learn.
Activity 1.4a: You have five minutes to read and study the following paragraph and try to answer the assigned questions from your memory.

CHERNOBYL

In the early hours of April 26, 1986, the number four reactor of an ageing, poorly designed nuclear power plant in the Ukrainian city of Chernobyl exploded, releasing into the atmosphere 40 times the radioactivity of the two atomic bombs dropped on Japan in World War II.

It killed 31 inadequately trained workers almost instantly and injured scores more. Scientists from around the world scrambled to evaluate what many considered to be the greatest industrial accident of all time and what effect the massive radioactive cloud would have on a jittery, downwind Europe.

A crumbling Soviet leadership hell-bent on secrecy and deception only made matters worse. Hundreds of thousands of Ukrainians, Russians and Belarusians were forced to abandon cities, while two million Belarusians are believed to be living in areas still considered contaminated.

Historians argue that the disaster only highlighted to the Soviet people a communist system’s inadequacies in delivering basic services, particularly in crisis situations, and this helped fuel the Ukrainian and Belarusian independence movements.

It also forged an all-powerful environmental movement throughout the world in general and Europe in particular. Ironically, and authoritative United Nations report in 2000 found no scientific proof of any significant radiation-related health effects to the millions of people exposed across Scandinavia and eastern Europe.
Activity 1.4b: Try to answer these questions without referring back to the paragraph

1. What was the number of the reactor that exploded?
   __________________________________________

2. How many employees were killed?
   __________________________________________

3. How many Belarussians are believed to be still living in contaminated areas?
   __________________________________________

4. What were two significant outcomes from the Chernobyl incident?
   __________________________________________
   __________________________________________

5. What were the findings of the United Nations report in 2000?
   __________________________________________
   __________________________________________
Activity 1.5a: You have two minutes to study the items below. Try to remember all of them.
Activity 1.5b: What were the 12 objects you tried to learn? Write them in the spaces below.

1_________________
2_________________
3_________________
4_________________
5_________________
6_________________
7_________________
8_________________
9_________________
10________________
11________________
12________________
Activity 1.6: Rearrange the following words to identify different types of sports. Write your answer in the spaces below.

a. GINXOB
b. ENO ULAMROF
c. BYGUR
d. KONERS
e. LABSEALB
f. TRADS
g. TICSELATH
h. YEKHOC
i. GLINWOB
j. NGVIID

a. f.
b. g.
c. h.
d. i.
e. j.
Activity 1.7: Draw a line to match the word with the best definition

<table>
<thead>
<tr>
<th>Multicoloured</th>
<th>BEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has four legs</td>
<td>FURNACE</td>
</tr>
<tr>
<td>A lover of honey</td>
<td>JELLY FISH</td>
</tr>
<tr>
<td>Kitchen appliance</td>
<td>HORSE</td>
</tr>
<tr>
<td>Flies in the sky</td>
<td>CALENDAR</td>
</tr>
<tr>
<td>See through</td>
<td>KITE</td>
</tr>
<tr>
<td>Can sting</td>
<td>RAINBOW</td>
</tr>
<tr>
<td>Hot</td>
<td>TRANSPARENT</td>
</tr>
<tr>
<td>Stable animal</td>
<td>DOG</td>
</tr>
<tr>
<td>A record of time</td>
<td>STOVE</td>
</tr>
<tr>
<td>Lives in the ocean</td>
<td>BEAR</td>
</tr>
</tbody>
</table>
Activity 1.8: Place the above words correctly into the crossword grid

BUILDING SUPPLIES

Wire
Aluminium
Concrete
Timber
Steel
Bricks
Mortar
Tin
Bamboo
Cement
Glue
Appendix I: Education Group 12 Month Booster Materials
PACE

BOOSTER SESSION
FOR EDUCATION GROUP
Welcome and Introduction
(Duration: 5 minutes)

- Thank you for agreeing to continue to participate in the PACE study for a further 12 months.

- The purpose of today’s session is to provide you with a “booster session” which covers some of the areas relevant to the program you participated in approximately 12 months ago.

- We have conducted a number of different research trials in our centre over the years and I am going to present you with some of the findings which relate to the effects of lifestyle on memory and well being. We will review the topic of healthy and successful ageing in men and women.

- This session is going to run for one hour. Feel free to interrupt me at any stage if you would like to make a comment or ask a question.

- If at any time during this session you need to have a break or use the bathroom, feel free to leave the room. The toilets are located…(described depending on room running session in).

- Any questions before we start?
We have conducted research looking at the relationship between lifestyle factors and healthy ageing in men and women in their 70s and older.

In one study, over 600 men were followed up for five years and completed an assessment of their cognition and a depression screen. They were also asked to provide information about their own medical issues, diet, smoking and physical activity.

A relationship was found between education, physical activity and mental health. Higher education and engaging in physical activity (vigorous and non-vigorous) were associated with a good mental health outcome. That is, stronger cognitive performance and lower depression scores.

Moderate alcohol intake and the consumption of low fat milk were associated with a decreased risk of cognitive impairment.

A similar study was done with a group of 278 women who had an average age of 75 years.

They found that those women who were physically active were 50% less likely to be depressed and anxious. They also reported a better quality of life.

Smoking and weight were also linked to depression and quality of life.

Those women who had ever smoked more than 20 cigarettes per day were at greater risk for developing depression and those who were overweight tended to rate lower on the quality of life measure.

This may related to the fact that in addition to an increased risk for cardiovascular disease and diabetes; overweight individuals are more likely to experience bodily pain and arthritis, dissatisfaction with their appearance and the potential to experience limitations in their ability to do day to day activities.

As in the study with the gents, more years of education and a moderate amount of alcohol were also associated with a stronger cognitive performance.

On the issue of alcohol consumption - not all studies have identified benefits associated with light to moderate consumption and this is sometimes why we hear and read mixed reviews in the media.

Previous research has linked a light to moderate consumption of alcohol to reduced risks of stroke, heart disease and mortality.

There has also been some suggestion that moderate alcohol consumption may promote the release of acetylcholine, a neurotransmitter in a part of the brain -the hippocampus, which in turn is associated with improved memory and learning.

The presence of antioxidants, particularly in red wine, has also been postulated as a possible mechanism to explain the decreased risk of dementia among consumers in observational studies.

Alcohol consumption has however been associated with cognitive decline and can cause problems with fatigue, falls and injuries as well as to interact with medications. It is not therefore something that we would necessarily advocate as a preventative strategy against memory decline.
I have spoken to you in the past about the benefits of physical activity and there are a number of theories about the relationship between physical activity and cognition (mental abilities).

We know that by being physically active it is possible to decrease the risk of cardio-respiratory disease, diabetes, obesity, osteoporosis and cerebro-vascular events.

There are also a number of studies which have observed a relationship between physical activity and cognition. In addition the studies I have just mentioned, we also one called Fitness for the Ageing Brain Study or (FABS) which some of you may have participated in.

In the FABS study 138 participants completed a trial whereby they were either randomised to an intervention group and received a 24-week home based physical activity program, or to a control group of usual care; meaning that they just engage in the sort of activity they normally would have in a usual week.

Level of physical activity was monitored using a pedometer and participants completed an assessment of their cognition at baseline, 6 months, 12 months and 18 months.

The individuals who completed the home based exercise program, (the intervention group), where more physically active and also demonstrated improved performance on the cognitive testing, relative to the control group, or individuals who maintained just their usual amount of physical activity. That is engaging in regular physical activity led to stronger performances on tasks assessing abilities such as memory, language and drawing.

It is uncertain as to why physical activity seems to have an impact on cognition. It may be due to the fact that physical activity can lead to:

1) Opportunities for increased social activity.
2) A reduction/release from depressive thoughts.
3) Greater cardiovascular fitness which in turn protects against major cardiovascular events and the potential cause of cognitive impairment or depression.
4) Enhanced neurotransmitter activity in the brain (a release of feel good chemicals).
Sleep and Depression

- We have also conducted studies looking at sleep problems in older adults. We sampled over a 1000 people aged 60 years and older who were in contact with their GPs.

- More than 1/3 of participants reported difficulty falling asleep or waking early in the morning; and more than ½ reported being restless/wakeful during the night.

- Those older adults who complained of sleep difficulties were more likely to be using sleeping tablets and to complain of having fair or poor health.

- One other factor that was interesting was that those individuals who were reporting suffering from sleep disturbance were four times more likely to be depressed than those without sleep problems.

- On the subject of depression - a nationwide study of data collected from over twenty thousand older adults aged 60 and over revealed that at any given point in time approximately 8% experienced clinically significant depressive symptoms likely to disrupt their daily lives. Nearly 2% will be experiencing a major depressive episode. The rates for men and women were fairly similar.

- Additionally, those individuals within the study who reported clinically significant depressive symptoms were also more likely to report multiple falls.

- Falls are a significant issue for older adults, being associated with an increased risk of placement in residential care facilities, hospitalisation and death.

- Over a 1/3 of older adults will fall every year and of this group nearly 70% of them will sustain an injury and 24% will require medical treatment.

- Whilst it is difficult to know whether people with depression are more likely to fall or whether people who fall are more likely to be depressed, the evidence available suggest that depression and depressive symptoms are predictive of falls.

- Older people with depression have an abnormal gait pattern and postural abnormalities in the standing position which suggests a physiological rather than psychological origin for their falls. Depression is also independently related to fractures, dizziness and increased fear of falling.

- It is also possible that falls may lead to depression (reverse causality) by reducing functional status and increasing disability.
More Food for Thought...

- As you will be well aware by now, there are a number of different factors that are likely to contribute to healthy and successful ageing, though the general themes tend to be the same. A similar example of what we have been talking about, taken from a different perspective came from two researchers in the mid 80’s, Offenbacher and Poster, who interviewed a group of older adults. These researchers found that older adults tended to report four key principles to ageing successfully. These included:

  1) Don’t feel sorry for yourself
  2) Be independent
  3) Don’t just sit there, do something
  4) Be sociable

- Drawing on these four points, the key to successful ageing may also be related to maintaining behaviours characteristic of middle age, including remaining active, continuing to partake in social interactions and maintaining similar attitudes and independence.

- Doing things, having an impact, and receiving the feedback from these behaviours is also important. We’ve talked previously about taking part in volunteer activities as well as becoming involved in learning and educational experiences post retirement. Each of these types of activities can increase feelings of purpose and personal satisfaction.

- Being optimistic and having goals is also important. Goals can be short term (such as planning to cook a nice roast on Sunday night or painting the lounge room) and long term (eg. learning how to play bridge or visiting all the art galleries in the Perth Metro area).

- The fourth point “be sociable” is also one of the keys to successful ageing. Social support plays a role in maintaining well being, promoting healthy living and reducing isolation.
It’s Not All Doom and Gloom

- As a final note, getting older does not just have to be about minding your health. There are a number of positives associated with ageing and I’ve got ten examples that we are going to run through; feel free to make comments as we go along.

- The Positives of Getting Older:

  1) Time to pursue your own personal interests – Options to explore the types of activities and knowledge that you felt there was never time for before. It’s never too late to learn something new or take on a new challenge.

  2) A stronger sense of appreciation of what you have – Wisdom and perspective mean that you are able to understand and come to terms with your own limitations, whether it be health, physical, mental or financial. You have a stronger understanding of the meaning of “worth” and taking things “for granted”.

  3) Richer knowledge and life skills – Life is about learning and as you pass through various stages you acquire more knowledge about not only the world around you but also about yourself. It doesn’t matter if you only had a few years of education, or never worked in formal employment because you stayed at home to raise a family; all kinds of knowledge are valuable.

  4) More stories to share – You have the benefit of having lived in the 19th and 20th centuries and to have seen how things have changed over time, for better or worse and are able to share rich stories about how society has evolved over the years.

  5) Less to prove – There is no longer a need to be competitive or as driven to do something of great importance; You still have contributions to make, though can “work and play” for interests sake and not necessarily to look good in the eyes of others which may have been a source of stress when you were working.

  6) Greater appreciation of people – You have the experience of having developed a good understanding of people and the value of relationships whether it be with family members of friends. You are more grateful of good company and kindness.

  7) Time to reflect – Being able to reflect on the fine moments and sense of accomplishment along the journey you have taken to reach the point where you are now and having the benefit of using the gifts of experience and long term memory to assess life’s expedition.

  8) Better at prioritising – Knowledge and experience mean that you are better at assessing and prioritising activities, objects, people, circumstances that are important and necessary for your own well being.

  9) More at peace with oneself – Young adults can feel confused, frustrated or uncertain with what the future holds – this in part may be a product of a lack of insight into what they want or knowing who they are in the first place. Self knowledge is something that can’t be taught, it comes with age and has to be learnt from within. The older we become, the more perceptive we are at viewing ourselves.

  10) You’re your own boss! – This needs little explanation and is the one comment that comes up time and time again when I ask people what they enjoy most about being retired.
Closing Comments and Take Home Messages:
(Duration: 5 minutes)

- We have come to the end of our booster session. Does anyone have any questions?

- I’d like to thank you all for coming along today; I hope you have found it interesting and have been reminded of some of the information covered in the topics we completed over 12 months ago when you first participated in the program.

- The next time you hear from the PACE team will be when we contact you to complete your final testing in approximately 12 months time. This assessment will be similar to what you have recently completed.

- Are there any comments before we finish up?

- Thank you once again and see you next year.