Memory Rehabilitation for people with Dementia

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- Memory formulates our responses to information
- A component of Cognition
- Cognition and Perception cannot be separated
- Attention and Perception are related to memory
- We must perceive and attend to an item before it can be remembered (Grieve, 1993)

Components of Cognition

- Attention
  - spatial attention
  - attention in action and behaviour
- Memory
  - classify/encode
  - store ---- information
  - retrieve

- Planning and problem solving

- Executive functions

Memory

- Memory is the ability to
  - store
  - retain
  - recall/retrieve information

- Can be broadly divided into
  - short-term/working memory
- - long-term memory

Areas of Brain involved in Memory

- Hippocampus
  - (medial temporal lobe)
- Basal ganglia
  - (diencephalon)
- Frontal lobe

Short-term Memory

- Holds information for several seconds and allows rehearsal before
    - activating a response
- Information is then allowed to decay or is passed into long-term memory store.

Long-term Memory

- Holds information for periods of time from a few minutes to many years

Working Memory (Baddley, 1986)

- Involves a range of temporary stores
  - phonological loop (inner voice)
  - visiospatial sketch pad (inner eye)
- Controlled by an attentional system called the CENTRAL EXECUTIVE

Central Executive

Has limited capacity

- Directs the allocation of attention to both the visual and verbal aspects of a task (Grieve, 1993)
- CE very important when demands of a task very high e.g. Multi-tasking
- In AD the CE is less able to co-ordinate activities and has a reduced processing capacity

Long-term Memory

- Episodic memory - linked to a time and a place (vulnerable in AD)
- Semantic memory - stored knowledge about the world unrelated to the events at the time of learning (more resistant in AD)
- Procedural memory - how to - our motor skills (spared in AD until severe stages)

Vascular Dementia VaD

- Second most common form after AD
- Cerebro-vascular disease is primary cause of VaD
- Multiple infarcts of small and medium-sized cerebral vessels produce lesions over wide area
- Usually abrupt in onset with stepwise loss of cognition as multiple strokes occur

- Memory loss less severe in early stages but pursues a more aggressive course than AD (Bowler et al, 1997)

Dementia with Lewy Bodies (DLB)

- Common form of dementia (15% - 20% in over 65's)
- Lewy bodies are small collections of protein
- DLB causes a cortical dementia with
  - fluctuating confusion
  - impairments of attention
  - sensitivity to neuroleptic drugs
  - spontaneous parkinsonism

- visual hallucinations (well formed figures/animals early in the disease – 50%)

- mean survival time similar to AD but can show rapid deterioration with death within 1-2 years (McKeith et al, 2002)

Frontotemporal Dementia (FTD)

- 20% of cases of dementia
- Primary cerebral atrophy with non-AD pathology
- Pre-senile onset
- Disorder primarily of behaviour
- Loss of basic/social emotions
- Disinhibition
- Personal neglect
- Apathy

- Overeating
- Wandering
- Pacing

Temporal lobe variant is Semantic dementia

Semantic Dementia

- Focal clinical syndrome
- Progressive loss of conceptual knowledge about the world (Snowden et al, 2004)
- Eventual loss of semantic memory for objects as well as words
- Asymmetrical with greater left-sided involvement
- Persons with SD present with an impairment of naming and loss of word meaning (Chan et al, 2001)

Alzheimer's Disease (AD)

- Most prevalent form of dementia in persons over 65 (Cummings, 2004)
- Involves multiple cognitive deficits that include
- Memory impairment and at least one of the following cognitive disturbances:
- Aphasia (deterioration of language function)
- Apraxia (deterioration of the ability to perceive, comprehend or carry out normal function

- Agnosia (failure to recognise or identify objects despite intact sensory function
- Disturbance in executive function (failure in the ability to think abstractedly and to plan, initiate, sequence, monitor and stop complex behaviour) DSM-1V; APA, 1994

- Cognitive deficits that occur In Alzheimer's disease 'must be sufficiently severe to cause impairment in occupational or social functioning and must represent a decline from a previously higher level of functioning' (The Cochrane Library, 2000)

- Neuropsychiatric symptoms commonly accompany AD. These include:
- Agitation
- Apathy
- Depression
- Anxiety
- Irritability
- Disinhibition

- Most prevalent symptom is;
- Apathy (70% approx) (Boyle and Malloy, 2004)
- Deficits also occur in performance of IADL's, PADL's and together with behavioural problems result in caregiver burden (Cummings, 2001)

Pathophysiology of AD

- First described by Alois Alzheimer in 1906
- 'August D'
- Deficits divided into 2 catagories

  - those associated with neurotransmitter metabolism

  - those associated with structural loss of brain tissue (DeKosky, 2001)

- There is accumulation of extracellular amyloid plaques which are fibrils of an abnormal protein called beta-amyloid

- There is formulation of intracellular neurofibrillary tangles made up of abnormal tau protein filaments. These form early; are insoluble leaving ghost/tombstone tangles which lead to an oxidative and inflammatory response. Neurodestrutive cascade

- Destruction of neurons responsible for the liberation of the neurotransmitter ACETYLCHOLINE
- There are 3 stages to AD
- Mild
- Moderate
- Severe

General Principles of Memory Rehabilitation

- Memory Training is part of cognitive training
- Cochrane states that CT involves 'guided practice' through individual or group sessions on a set of standard tasks designed to reflect particular cognitive functions such as memory, attention or problem-solving. Memory training is the component of CT that is aimed at the remediation of memory deficits (Clare et al, 2004)

- Memory training involves the use of:
- Exercises
- Repetitive practice
- Drills

Commonly included in this approach are such tasks as face-name recall and word list learning tasks

Cognitive Rehabilitation

- Defined as an individualised approach which should focus on real-life, functional problems, it should address associated problems such as mood and behavioural problems and involve relatives and caregivers (Wilson, 2002)
- Memory rehabilitation is part of Cognitive Rehabilitation (Wilson et al, 1997)

- CR approach developed mainly through work with persons with acquired brain injury but has been found to be equally appropriate for rehabilitation of memory deficits in early AD (Clare et al, 2000)

- Memory rehabilitation taps into a ‘partially intact learning capacity’ (Bird, 2001)

- The key concept of Memory Rehabilitation is:
- Enabling people with memory difficulties to

COMPENSATE

3 main areas:

- Environmental Adaptation (reduces reliance on memory; cueing)

- Use of external memory aids (the use of these cognitive prosthetics are the most important element in MR (Wilson et al, 1997). These external cues provide a high degree of memory retrieval support
- Use of internal strategies e.g. Mneumonics which are both verbal (thirty days hath September) and Visual (pairing a name with an image)

Insight

- Lack of awareness or insight (anosognosia) of the individual must always be taken into consideration when assessing individuals suitability for MR.
- Higher levels of awareness are related to better cognitive outcomes (Clare et al, 2004)