Dementia / Amnesia
• “Memento”, “Bourne” series, “The Notebook” “50 First Dates” etc.
• Memory refers to the ability of the brain to store and retrieve information.

• Memory complaints are common, particularly among the elderly. Forgetfulness is considered “normal” in advanced age, but the definition of “normality” is vague.

• Population ageing, magnitude of problem rising

• More young people with memory problems
The Anatomy of Memory

• 14 Billion neurons
• Diencephalon: medial thalamic structures
• Hippocampal formation (dentate gyrus, hippocampus, parahippocampus, subiculum, entorhinal cortex)
• Neocortex (association areas)
• Midbrain reticular formation
Memory stages

- **Immediate memory** (working memory): Information that can be kept in conscious awareness without active memorization (7 digits)
- **Short-term** (recent) memory: (episodic memory) the ability to register and recall specific items after a delay of minutes to hours. Hippocampus and parahippocampus (and amygdala) required. Requires a consolidation period
- **Long-term** (remote) memory: Long-known information. Can be retrieved without hippocampal system.
The amnestic syndrome
(loss of short term memory)

- Impaired recent memory (anterograde, retrograde)
- Global amnesia
- Spared procedural memory
- Preserved immediate memory
- Preserved remote memory
- Intact general cognitive function
- Disorientation to time or place
- Confabulation
The amnestic syndrome  
(loss of short term memory)

• “Eternal present tense”
• Repeat same experiences without learning from them.
• Can score well on IQ test and not recall taking the test a few minutes later.
Causes of amnestic syndrome

- Head injury
- Surgical
- Bilateral strokes - posterior cerebral arteries
- Herpes simplex encephalitis
- Wernicke-Korsakoff syndrome
- Ruptured septal aneurism
Partial memory loss

- Only certain categories of memory lost
e.g. names
Transient Global Amnesia

• Temporary version of amnestic syndrome
• Duration up to 24 hr
• Suddenly loses short term memory
• Ask repetitive questions about environment
• May confabulate
• Anterograde and retrograde memory loss
• Left with permanent amnesia for the period during which the episode occurred
• Causes unclear, possibly central venous congestion, partial seizures, migraine, TIA
Dementia
Definition of dementia

The development of multiple cognitive deficits that include memory impairment and at least one of the following:

- Aphasia
- Apraxia
- Agnosia

- Disturbance of executive functioning
- The cognitive deficits must
  - Be severe enough to impair functioning
  - Represent a decline from a previous level
- Diagnosis not made during a delirium. Both may be diagnosed when the delirium is not present
- Dementia may be related to GMC, persisting effects of substance abuse or combination
Two basic types of dementia

- **Cortical dementia:**
  - Amnesia, with variable combinations of aphasia, apraxia, agnosia. More severe early in course. Motor abnormalities uncommon, depression uncommon. Memory not aided by clues e.g. Alzheimer’s

- **Subcortical dementia:**
  - Slowness, attention and motivation reduced. Apathy, irritability, depression may co-exist. Motor abnormalities common (dysarthria, extrapyramidal). Memory aided by clues. Many causes, most treatable dementias are subcortical (e.g. AIDS-related)
3 basic categories of dementia

- Dementia associated with evidence of other medical illness
- Dementia associated with other neurological illness but not with medical illness
- Dementia the only evidence of illness
Alzheimer’s disease

- Classical picture of pervasive short-term memory disorder
- Geographical dysorientation
- Word finding difficulty
- Loss of learned motor skills
- Perceptual problems may develop
- Judgment and problem solving impaired
Alzheimer’s disease

A. On the basis of evidence from a patient’s history and mental status examination, Alzheimer disease is characterized by the presence of major impairments in learning and in retaining new information and at least 1 of the following impairments:
   1. Impaired handling of complex tasks
   2. Impaired reasoning ability
   3. Impaired spatial ability and orientation
   4. Impaired language
B. The impairments in A notably interfere with work or usual social activities or relationships with others.
C. The impairments in A represent a notable decline from a previous level of functioning.
D. The impairments in A are insidious at onset and progressive.
E. The impairments in A do not occur exclusively during the course of delirium.
F. The impairments in A are not better explained by a major psychiatric diagnosis.
G. The impairments in A are not better explained by a systemic disease or another brain disease.

*Two criteria from the National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer’s Disease and Related Disorders Association have been dropped: the age limitation and the requirement for psychometric test confirmation.
Alzheimer’s disease

- Behavioral problems very common and may be the main burden
- Delusions and hallucinations occur

- Choline-esterase inhibitors slow disease progression for ± 1 year
- Memantine recently approved in RSA
- A stimulating and carer-intensive environment has effects that are comparable to the use of choline-esterase inhibitors
Vascular dementia

- A causal link between a clinical stroke within 3 months OR
- Bilateral supratentorial gray matter infarctions
- 10 – 20 % of dementias have a substantial vascular contribution
- All vascular risk factors to be addressed
- Choline-esterase inhibitors also beneficial
- Mean survival shorter than Alzheimer’s: only 3 years
**Dementia with Parkinsonism**
*(dementia with Lewy-bodies)*

- **Motor features of parkinsonism present**
  - Mainly rigidity, seldom tremor
- **Fluctuations in consciousness**
  - Daytime somnolence, periods of decreased attention
- **Sleep disturbance**
  - REM sleep behaviour disorder (acting out dreams) (50 %)
- **Prominent visual hallucinations**
- **Very sensitive to neuroleptics** – be cautious
Rapidly progressive dementias

- Creutzfeldt-Jacob disease commonest: 1:1,000,000 population
  - Course over weeks to months
  - Myoclonus, eye movement disturbance, parkinsonian features, ataxia; later akinetic, mute.
- New-variant disease often present with psychiatric features.
  - Diagnosis: MRI, EEG, 14-3-3 protein on CSF
- Toxic factors (e.g. Wernicke’s, medications, lead exposure, CO)
- Metabolic disturbances (sodium, calcium, hepatic encephalopathy)
- Depression
- Acute stroke (including vasculitis)
- Structural brain lesions (e.g. chronic subdural hematoma, normal pressure hydrocephalus)
- Chronic meningitis
- Paraneoplastic
Frontotemporal degenerations

- Regional cerebral atrophy
- Behavioral disturbance (e.g. disinhibition)
- Profound alteration in personality and social behavior; patient has neither insight nor concern
- Different patterns exist, according to region of atrophy
- Includes progressive nonfluent aphasia
Subcortical Arteriosclerotic Encephalopathy

- “Binzwanger’s disease”
- Often similar history to vascular dementia
- May be slowly progressive, can present with memory disturbance
- Subcortical type dementia
- Motor signs present
- Ischemic periventricular demyelination
- Criteria:
  - Dementia
  - Leukoaraiosis on CT or MRI
  - 2 of 3:
    - Vascular risk factor(s)
    - Evidence of focal cerebrovascular disease
    - Evidence of subcortical cerebral dysfunction (e.g. gait disorder)
• NB!!!! Vascular dementia can be prevented!!
• Treatment of hypertension can reduce dementia with up to 50%!!
Some other causes for dementia

- **Infections:**
  - HIV
  - Other viruses (HSV/ SSPE/ PML)
  - Neurosyphilis
  - Chronic meningitis
  - Whipple’s disease

- **Metabolic disturbances:**
  - Electrolyte aberrations
  - Vitamin deficiencies
  - Hypothyroidism
  - Chronic hypoglycemia
  - Calcium and corticosteroid homeostasis
  - Renal / hepatic insufficiency
Some other causes for dementia

• Inherited disorders of metabolism:
  – Wilson’s disease
  – Metachromatic (and other) leukodystrophy
  – Storage disorders
  – Mitochondrial disorders

• Neoplasms (cerebral or systemic)

• Drugs and toxins

• Trauma

• Normal pressure hydrocephalus

• Pseudodementia (depression most common)
Clinical Approach to Dementia / Amnesia

- Reliable history of the illness
- Mental state examination
- Physical and neurological examination
- Special investigations
Reliable history

- An objective account is invaluable, and may provide all the information needed to confirm:
  - decline in cognitive function
  - previous level of abilities
  - time course
  - any stepwise progression
  - Myoclonus
  - visuospatial abnormalities etc.
Mental state examination

- "Mayo Mini Mental score" (Kokmen).
  - Orientation ( /8)
  - Attention ( /7)
  - Learning ( /4)
  - Calculation ( /4)
  - Abstraction ( /3)
  - General Knowledge ( /4)
  - Construction ( /4)
  - Delayed recall ( /4)
  - **Total** ( /38)

- Folstein Mini Mental State Examination
- ADAS-Cog etc.
Physical and neurological examination

• Focal signs/ extrapyramidal signs/ cerebellar dysfunction / myoclonus etc.
• Generalised lymphadenopathy/ oral thrush/ Kaposi sarcoma
• Jaundice/ neoplasm/ neck stiffness/ myxedema etc
Special investigations

- Aimed at identifying treatable conditions:
  - UKE, LFT, ammonia level
  - FBC
  - Syphilis serology
  - Thyroid function
  - Vitamin B12 levels
  - HIV if at risk
- Neuroimaging (CT/MRI/SPECT/PET…)
- Formal neuropsychological evaluation
- EEG
- CSF analysis
- Cerebral biopsy / Autopsy
Dignity