Ep 24 Dementia and Cognitive Impairment – Dr Matthew Chen

When should we suspect dementia? 1:35

- Memory: Memory loss, misplacing things, problems keeping track of things/activities, confusion with time or place
- Executive Function: Difficulty performing familiar tasks, poor or decreased judgment
- Problems with language
- Changes in mood, personality or behaviour
- Withdrawal from work/social activities

What is the difference between the terms cognitive impairment, mild cognitive impairment and dementia? 05:06

	Clinically normal	Preclinical / SCI / SCD	MCI	Dementia
Subjective	Normal	Impaired	Impaired	Impaired
Objective	Normal	Normal	Impaired	Impaired
Function	Normal	Normal	Normal	Impaired

- Cognitive impairment is an umbrella term that comprises a spectrum
- MCI: Objective impairment in neuropsychological domains, but no compromise in executive function
    - 10% year on year progress onto dementia
    - Amnestic (tend to progress to AD or VD) vs Non-Amnestic (tend to progress to FTD, DLB, PDD)
- Dementia: Objective impairment in neuropsychological domains with compromise in executive function (important to ascertain reason behind compromise in executive function – whether it is purely physical or if it is cognitively driven)
- **Note that mild cognitive impairment is not the same as mild dementia

How do we diagnose dementia? 09:58

- Usually diagnosed in the outpatient setting – potential confounding by acute medical issues that can cause delirium in inpatient setting
- 4-Step Approach
    - Is the forgetfulness/confusion acute or chronic?
    - If it is chronic, is it dementia?
    - If it is dementia, what are the complications?
    - If it is dementia, what is the aetiology?
- Diagnostic Criteria
    - Multiple criteria- APA DSM-5, WHO ICD-10, NIA-AA etc
    - DSM criteria most commonly used; DSM-5 has departed from the term ‘dementia’, instead termed ‘Major NCD’

§ Significant cognitive decline in any 1 or more of the following domains: Learning and memory, language, executive function complex attention, perceptual motor and social cognition; **of note, amnesia is not a pre-requisite**

§ Cognitive deficits interfere with independence in everyday activities (if ADLs not affected, then termed 'Minor NCD'

§ Decline in neurocognitive performance (e.g. MMSE, MOCA)

§ Exclusion of delirium, other mental disorders

- Evaluating for Delirium – Confusion assessment method (CAM)
  - Acute onset or fluctuating course AND Inattention +
  - Disorganised thinking OR Altered level of consciousness
  - DELIRIUM MNEMONIC: Drugs, Eyes/ears, Low O2 states (MI, PE, CHF, COPD), Infection, Retention of urine/stool, Ictal, Underhydration/nutrition, Metabolic, Subdural/sleep deprivation
- Reversible causes of dementia: Drugs, Emotional (depression), Metabolic (hypothyroidism, B?12 def, alcohol related), Ears/eye deficits, NPH, Tumour/paraneoplastic, Infection (meningitis/encephalitis), Autoimmune

What does the work up for dementia entail? 24:27

- MMSE/MOCA
  - Different versions of MMSE and MOCAs
  - MMSE – Has a more prominent ceiling effect in more educated patients

	60-74 years	≥ 75 years
0-6 years of education	20/21 (94%#, 93%*)	18/19 (94%#, 92%*)
≥6 years of education	23/24 (93%#, 87%*)	22/23 (100%#, 88%*)

sensitivity, * specificity

  - MOCA

	Cutoff	Sensitivity	Specificity
> 10 years of education	25/26	90.5%	70%
≤ 10 years of education	24/25	85%	80.6%

  - MMSE vs MOCA

Features	MMSE	MOCA
Domains tested	Orientation, memory, constructions, language, calculations, attention	Orientation, memory, clock drawing, constructions, fluency, language, abstraction, calculations, executive, attention
Administration	Clinician with patient	Clinician with patient
Time to administer	7-10 min	10-13 min
Advantages	Well-known scale; often used as proxy to stage dementia severity	Less ceiling effect than MMSE due to greater difficulty and more executive function tests; more sensitive to mild impairments than MMSE
Pitfalls	Ceiling effect especially in more educated patients; executive testing limited; does not distinguish between MCI and dementia	Some difficulty distinguishing between MCI and dementia
Cutoffs	Depends on educational level	Depends on educational level
Costs	Need to pay for manual and test forms if using Folstein's version	Need to pay training fee and recertify every 2 years

- Neuropsychological Assessment (NPA)
  - Tests like MOCA/MMSE may have limitations in yielding adequate information; NPAs are more detailed and in-depth evaluations
  - Battery of performance based assessments administered by neuro-psychologists
  - Uses
    - § Teasing out specific domain deficits for etiology corelation
    - § Measurement of recovery/treatment of response
- Laboratory Investigations
  - Routine: FBC, renal panel, calcium, LFT, TFT, B12/folate
  - If appropriate: Neurosyphillis, biomarkers (mainly research)
- Neuroimaging
  - Usually some form of imaging is done in clinical practice – Whether MRI vs CT vs PET, depends on clinical scenario
  - While dementia is a largely clinical diagnosis, imaging can pick up features in keeping with specific dementia etiologies (e.g. temporal lobe atrophy in AD) or reversible causes (e.g. NPH)
  - Canadian consensus (CCCAD) provides guidance on when neuro-imaging should be performed

How do we grade the severity of dementia? 44:02

- Assessment is predicated on function
- Simplest would be the DSM-5 Criteria

Mild	Moderate	Severe
Difficulties with IADLs (e.g. housework, managing money)	Difficulties with BADLs (e.g. feeding, dressing)	Fully dependent

- Other staging systems: Clinical dementia rating (CDR), FAST
- Implications: Prognostication, providing clues to alternative pathology if presentation is out of keeping with anticipated severity trajectory, guide treatment/interventions

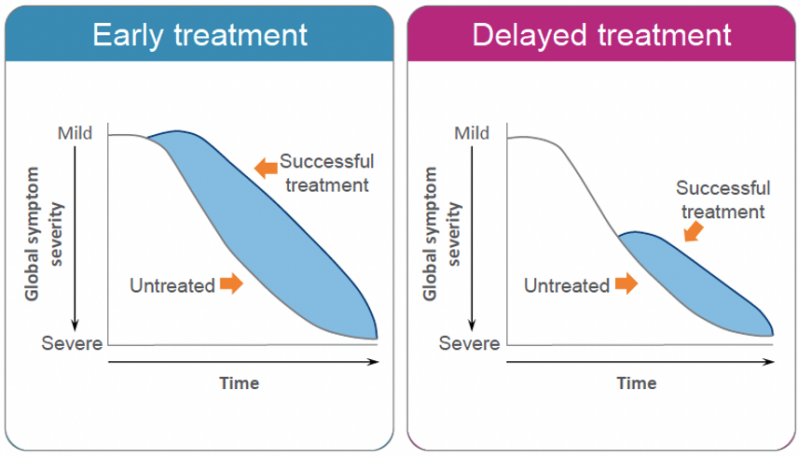
What are the causes of dementia? 52:34

- Epidemiology: While Alzheimer's is the commonest (60-80%), majority of patients with dementia have mixed etiologies
- Alzheimer's disease
    - Gradual/insidious onset over months to years – hence recall of symptomatology may be challenging
    - Commonly affects memory, executive function, language, visuospatial domains
    - Prognosis 8-10 years
- Vascular dementia
    - Stepwise decline may or may not be present
    - Features depend on extent and areas of stroke disease
    - Relationship between stroke disease (typically in strategically placed infarcts like angular gyrus, thalamus, basal forebrain or PCA/ACA territories) and cognitive decline
    - Prominent deficits: Neurological deficits, emotional issues (emotional incontinence/lability), executive dysfunction
- Dementia of Lewy Body
    - Core Clinical Features: Attention deficits (may be repeatedly labelled as delirium), visual hallucinations (well-formed and detailed), Parkinsonism, REM sleep behaviour disorder
    - Severe sensitivity to antipsychotic medications
    - 1 year rule: Parkinsonism features should be < 1 year for DLB
    - Parkinson's disease dementia usually occur late in Parkinson's Disease
- Fronto-Temporal Dementia
    - Occurs in younger patients: 45-65 years
    - Survival time from symptom onset 6-11 years – often 5 years or less from time of dx
    - Behavioural variant vs language variant

Pharmacological Treatment in Dementia 1:07:00

- Overall management is multimodal, patient centred and individualised – pharmacological measures are one small component
- Risk assessment is crucial – cooking/driving, malnutrition, abuse/exploitation
- Non-pharmacological interventions: Cognitive stimulation therapy
- Pharmacological treatment drugs have been approved for AD, DLB and PDD; mixed evidence for vascular dementia, no evidence for FTD
- Pharmacological agents target neurotransmitters rather than underlying pathology; ongoing research into looking at agents that alter the course of disease progression

- Treatment considerations: Dementia etiology, stage of disease, clinical profile and comorbidities, expected benefits, side effects, affordability



- Cholinesterase Inhibitors
  - Usually for mild to moderate dementia; but can still keep on even in severe dementia if already on
  - Options: Donepezil and rivastigmine in NUH
    - § AD – Donepezil or rivastigmine
    - § DLB, PDD – Rivastigmine
  - Modest benefit on cognition: Mean difference of 1.37 points on MMSE
  - Some global change in ADLs
  - Side Effects: Nausea, vomiting, diarrhea, vivid dreams (donepezil only), leg cramps, bradycardia, small number may exhibit acute worsening of cognition/agitation will need to stop meds
  - Side effects usually wear off by 1-2 weeks as the body adjusts
- NMDA Receptor Antagonist – Memantine
  - Reduce toxic effects of glutamate released from degenerating neurons
  - Can be used as monotherapy or in conjunction with cholinesterase inhibitors
  - For moderate to severe dementia – improvement in behavioural symptoms
  - Needs to be dose adjusted in renal impairment
  - Side effects – Generally well tolerated; dizziness, headache, constipation
- Dosing Recommendations

Drug	Dose	Common side effects	Comments
Acetylcholinesterase inhibitors			
Donepezil	5 mg ON, increase to 10 mg ON after ≥ 4 wk	Oral medicines: nausea, vomiting, diarrhoea, bradycardia	• Contraindicated in bradycardia; exercise caution in peptic ulcer disease • Donepezil: Aricept is orodispersible. A generic version of donepezil is now available • For gastrointestinal side effects, stop for a week, then restart; some patients may tolerate the drugs on re-challenging
Rivastigmine capsule	1.5 mg BD, titrate to 6 mg BD		
Rivastigmine patch (transdermal)	Exelon Patch 5, increase to Patch 10 after ≥ 4 wk	Skin patch (Exelon): rash, itch; fewer gastrointestinal side effects	
NMDA receptor antagonist			
Memantine	5–20 mg daily (titrate from 5 mg)	Headache, giddiness; constipation at higher doses; rarely paradoxical insomnia	• Approved for moderate to severe Alzheimer's disease; can be used as monotherapy or in combination with donepezil • If creatinine clearance < 30 mL/min, max 10 mg daily

Which patients would benefit from a geriatrics consult? 1:24:05

- If there is uncertainty
- Confirmation of diagnosis: Usually requires a geriatrician/psychiatrist to make the diagnosis

Take Home Points 1:26:41

- Spectrum of cognitive impairment: Normal > SCI > MCI > Dementia
- Types of dementia – AD, VaD, DLB, PDD, FTD
  - Symptoms and features
  - Assessment and diagnosis
  - Labs and neuroimaging
  - Staging
  - Management including pharm treatment
- ABCDEF Approach
  - Assessment: Establishment diagnosis, education/counselling, explore drugs
  - Behaviour Management: Non-pharm/pharm – DICE approach (describe, investigate, creation, evaluate)
  - Caregiver stress: Explore extent and causes, consider community services
  - Disability: Determine care needs and support required, risk assessment
  - EOL issues: Prognostication, ACP, palliation
  - Finances: Schemes/subsidies, medicolegal issues