3D Gerontotlogy:
Delirum, Dementia and Deprescribing

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Nurse Practitioner and Associate Professor

NPNZ Conference
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Wellington
**Confusion Assessment Method (CAM)**

The diagnosis of delirium requires presence of **BOTH A and B**

<table>
<thead>
<tr>
<th></th>
<th>Acute onset / fluctuating Course</th>
<th></th>
</tr>
</thead>
</table>
| A | • Is there evidence of an acute change in mental status form patient baseline.  
   • Does the behaviour  
     • Come and go?  
     • Fluctuate during the day?  
     • Increase / decrease in severity? |   |
|   | Inattention                      | B |
|   | Does the patient:                |   |
| B | • Have difficulty focusing attention? |   |
|   | • Become easily distracted?      |   |
|   | • Have difficulty keeping track of what is said? |   |
and the presence of **EITHER C or D**

| C | Disorganised Speech | Is the patient’s thinking:  
|   |                 | o Disorganised  
|   |                 | o Incoherent  
|   | For example, does the patient have:  
|   | - Rambling speech / irrelevant conversation?  
|   | - Unpredictable switching of subjects?  
|   | - Unclear or illogical flow of ideas?  

| D | Altered Level of Consciousness | Overall is the patient’s level of consciousness:  
|   |                                 | o Alert (normal)  
|   |                                 | o Vigilant (hyper-alert)  
|   |                                 | o Lethargic (drowsy but easily roused)  
|   |                                 | o Stuporous (difficult to rouse)  
|   |                                 | o Comatose (unrousable)  

Confusion Assessment Method (CAM) (cont)
The rest of the CAM screen

• Disorientation: time, location
• Memory impairment?
• Perceptual disturbances?
  Hallucinations / illusions
• Altered sleep-wake cycle: sleep in day, insomnia at night
Basic Delirium Screen Tests

- Midstream urine / urinalysis
- Full blood count
- Urea and electrolytes + calcium
- Renal function
- Glucose
- Liver function
- CRP (ESR?)
- Thyroid function
- Troponin I (?)
- Serum medication levels
- ECG
- Chest X-ray
- CT head, blood cultures, ABG, LP (acute care)
PERSON WITH DELIRIUM

- Prevent complications
- Reorientate reassure
- Reassure
- Relaxation techniques
- Educate carers, family
- Encourage activity Mobility/ADL
- Pain relief
- Vision Hearing aids
- Communication
- Identify/Treat reversibility
- Family involvement
- Ensure hydration
- Antipsychotic med
### Table 5. Delirium and mortality at 6 months

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM-negative</td>
<td>222</td>
<td>10%</td>
</tr>
<tr>
<td>CAM-positive</td>
<td>28</td>
<td>39%</td>
</tr>
</tbody>
</table>

### Table 7. Delirium and increase in level of care (note that the denominator here is 244 as 6 patients who died while in hospital were excluded)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM-negative</td>
<td>219</td>
<td>13.8%</td>
</tr>
<tr>
<td>CAM-positive</td>
<td>25</td>
<td>66.6%</td>
</tr>
</tbody>
</table>

### Table 6. Delirium and length of inpatient hospital stay

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Mean length of stay (days)</th>
<th>Standard Deviation (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM-negative</td>
<td>222</td>
<td>21.6</td>
<td>18.6</td>
</tr>
<tr>
<td>CAM-positive</td>
<td>28</td>
<td>25.4</td>
<td>19.7</td>
</tr>
</tbody>
</table>
# Resolved Delirium

McAvay et al.. Volume 54. Issue 82006 JAGS

<table>
<thead>
<tr>
<th>Delirium Status</th>
<th>Nursing Home Placement</th>
<th>Percentage of Days in Nursing Home*</th>
<th>Death</th>
<th>Days of Survival</th>
<th>Death or Nursing Home Placement</th>
<th>Days Until Death or Nursing Home Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N (%)</td>
<td>Mean ± Standard Deviation</td>
<td>n/N (%)</td>
<td>Mean (SE) †</td>
<td>n/N (%)</td>
<td>Mean (SE) †</td>
</tr>
<tr>
<td>Never delirious</td>
<td>111/378 (29.4)</td>
<td>24.1 ± 29.9</td>
<td>75/378 (19.8)</td>
<td>323.9 (4.8)</td>
<td>157/378 (41.5)</td>
<td>254.8 (7.7)</td>
</tr>
<tr>
<td>Delirium resolved</td>
<td>14/31 (45.2)</td>
<td>40.6 ± 37.9</td>
<td>8/31 (25.8)</td>
<td>313.8 (17.8)</td>
<td>21/31 (67.7)</td>
<td>180.9 (28.2)</td>
</tr>
<tr>
<td>Delirium at discharge</td>
<td>19/24 (79.2)</td>
<td>52.8 ± 40.0</td>
<td>9/24 (37.5)</td>
<td>234.0 (26.2)</td>
<td>20/24 (83.3)</td>
<td>80.1 (27.2)</td>
</tr>
<tr>
<td>P-value ‡</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>.03</td>
<td>.05</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

* Percentage of days calculated from onset of delirium to end of follow-up period.
† Mean and standard error (SE) calculated from data available for each status.
‡ P-values calculated using appropriate statistical tests for each category.
# Pharmacologic treatment

<table>
<thead>
<tr>
<th>Class &amp; Drug</th>
<th>Dose</th>
<th>Adverse Effects</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antipsychotic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haloperidol</td>
<td>0.25-1mg BD po with prn doses q4hrly (peak 4-6hrs)</td>
<td>EP symptoms</td>
<td>Usual agent of choice. Effectiveness demonstrated in RCT Avoid IV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prolonged QT</td>
<td></td>
</tr>
<tr>
<td><strong>Atypical antipsychotic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risperidone</td>
<td>0.25mg BD 2.5-5mg daily 12.5-50mg daily</td>
<td>EP effects equivalent to or slightly less than Haloperidol Prolonged QT</td>
<td>Tested only in small studies Associated with increased mortality in older people with sc</td>
</tr>
<tr>
<td>Olanzapine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quetiapine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Benzodiazepine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorazepam</td>
<td>0.5-1mg, add doses q4hrly as needed</td>
<td>Paradoxical excitation, resp depression, oversedation</td>
<td>2nd line agent Assoc with prolongation, worsening of symptoms Use for withdrawal, Parkinson's</td>
</tr>
<tr>
<td>Temazepam</td>
<td>Avoid monotherapy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Delirium Treatment

Yoon et al. 2011 BMC Psychiatry 13:240

![Graph showing delirium treatment by age group and medications.](image_url)
Dementia
(2016 Access/Deloitte)

The number of people with dementia is growing rapidly

More than 170,000 people are forecast to have dementia by 2050

2016: 62,287
2030: 102,015
2050: 170,212

These latest forecast estimates are significantly higher than previous estimates

Economic costs have increased 75% since 2011

2011: $955m
2016: $1,676m
2050: $4,579m

... and could be over $4.6 BILLION in today's dollars by 2050
Falling rates of dementia in UK and USA

**UK (1989-2004)**

**USA**

**DECLINING DEMENTIA RATES**
A long-running study finds that dementia rates have fallen by 44% in the past 40 years.

<table>
<thead>
<tr>
<th>Early 1970s-Late 1970s</th>
<th>Early 1980s-Late 1980s</th>
<th>Early 1990s-Late 1990s</th>
<th>Early 2000s-Late 2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6%</td>
<td>2.8%</td>
<td>2.2%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Mortality trends for coronary heart disease: age 35-69 years, New Zealand (Aotearoa)

Male deaths from this cause at age 35-69 years in 2008:
- 843 (20% of deaths at this age)
- 120 out of every 100,000 males at this age, a rate which was:
  → 37% less than in 2000 (rate: 190)
  → 79% less than in 1975 (rate: 562)
  → 75% less than in 1955 (rate: 470)

Female deaths from this cause at ages 35-69 years in 2008:
- 242 (8% of deaths at this age)
- 34 out of every 100,000 females at this age, a rate which was:
  → 44% less than in 2000 (rate: 61)
  → 81% less than in 1975 (rate: 184)
  → 80% less than in 1955 (rate: 175)
Mild Cognitive Impairment (MCI)

- Memory impaired but are otherwise functioning well and do not meet clinical criteria for dementia

- Symptoms include
  - Memory complaint, preferably with corroboration
  - Intact activities of daily living
  - Progression MCI → dementia ~ 10-15% per year in clinic-based studies (Mariani et al, 2007)

- There are currently no recommended treatments for MCI
  - Medication review
  - Exercise and social engagement

Cognitive Impairment Pathway – Waitemata DHB 2014

61 people enrolled in CIP (60 carers)

• 5% dropped out early
• 20% ‘other diagnosis’
• 34% dementia diagnosis
• 41% mild cognitive impairment diagnosis

“Other” Diagnoses

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cognitive impairment</td>
<td>4</td>
</tr>
<tr>
<td>Depression</td>
<td>2</td>
</tr>
<tr>
<td>Alcohol issues/depression</td>
<td>1</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>1</td>
</tr>
<tr>
<td>Seizure disorder/ inconclusive diagnosis</td>
<td>1</td>
</tr>
<tr>
<td>Stroke - admitted to *ARC (died)</td>
<td>1</td>
</tr>
<tr>
<td>Brain metastasis (died)</td>
<td>1</td>
</tr>
<tr>
<td>Moved out of area/subsequent ARC admit</td>
<td>1</td>
</tr>
</tbody>
</table>

*ARC = Aged Residential Care
Beta Amyloid Plaques

Midlife vascular risk factors were associated with elevated levels of brain amyloid later in life (JAMA 2017)

- obesity
- high blood pressure
- diabetes
- high cholesterol
- smoking

Rowe, et al., J Nucl Med 2011 vol. 52 no. 11
Vascular Dementia

• Previously thought to be about 20% of all dementias

• Now thought that there is very little ‘pure vascular dementia’

• Does the ischaemic changes from cardiovascular disease promote plaques and tangles?

• The Nun Study: lacunar strokes increase dementia risk 20 fold with fewer plaques and neurofibrillary tangles before showing signs of dementia.

TREATMENT:

Cardiovascular Health

Exercise

Active Mind

Socially Active
Link between Fizzy Drinks and Dementia (JAMA April 2017)

• Those who drink sugary drinks showed:
  – Poorer memory
  – More atrophy
  – Small hippocampus

• Those that diet soda daily were almost three times likely to develop stroke when compared to those that do not.
Deprescribing

Definition:
The systematic process of identifying and discontinuing drugs when:

• existing or potential harms outweigh existing or potential benefits within the context of an individual patient’s care goals
• current level of functioning
• life expectancy
• values, and preferences.

Scott IA et al. JAMA Internal Medicine May 2015
When to consider deprescribing?

• Patient presents with new symptoms which could be adverse drug effect (i.e. falls, confusion, fatigue)

• End-stage disease/ terminal illness

• Receiving high-risk drugs/ combinations

• Receiving preventive drugs in scenarios where drug can be safely discontinued

Scott IA et al. JAMA Internal Medicine May 2015
Priority Drugs for Deprescribing

- Survey of 65 Canadian geriatrics experts (36 pharmacists, 19 physicians, 10 CRNP), Modified Delphi approach
- Aim to ID and prioritize med classes where evidence-based deprescribing guidelines would be of benefit
- 5 priorities:
  - benzodiazepines
  - atypical antipsychotics
  - statins
  - tricyclic antidepressants
  - proton pump inhibitors.

5 Steps of Deprescribing

1.) Ascertain all drugs the patient is currently taking and reasons for each one

2.) Consider overall risk of drug-induced harm to determine the appropriate intensity of deprescribing intervention

3.) Assess each drug for its current or future benefit potential compared with current or future harm/burden potential

Scott IA et al. JAMA Internal Medicine May 2015
5 Steps (cont).*

4.) Prioritize drugs with
   • lowest benefit-harm ratio
   • lowest likelihood of adverse withdrawal reactions
   • Lowest disease rebound syndromes

5.) Implement a discontinuation regimen and monitor patients closely for improvement in outcomes or onset of adverse effects.

Scott IA et al. JAMA Internal Medicine May 2015
Drug Withdrawal Trials

  – Pts 65 and over
  – Multiple drug categories: Antihypertensives, psychotropics, benzodiazepines
  – Dc’d without harm in 20 to 100% of patients

• Reduction in falls and improvement in cognitive and psychomotor function (Psychotropics, Benzos)
  • Also replicated in another review (van der Cammen)

• 80% of participants with dementia were able to safely stop antipsychotics (Declercq T et al. Cochrane Database Syst Rev. 2013).

• Australian National Blood Pressure study
  – Found that 37% of participants remained normotensive 1 yr after drug withdrawal (Neson MR, et al. BMJ. 2002)
Deprescribing.org

Find out about EMPOWER brochures

EMPOWER brochures help patients understand the rationale for deprescribing certain medications and explain why it is important to talk to a health care provider about deprescribing.

View the brochures
Proton Pump Inhibitor (PPI) Deprescribing Algorithm

Why is patient taking a PPI?
- If unsure, find out if history of endoscopy, if ever hospitalized for bleeding ulcer or if taking because of chronic NSAID use in past, if ever had heartburn or dyspepsia

Indication still unknown?
- Mild to moderate esophagitis or GERD treated x 4-8 weeks (esophagitis healed, symptoms controlled)
- Peptic Ulcer Disease treated x 2-12 weeks (from NSAID; H. pylori)
- Upper GI symptoms without endoscopy; asymptomatic for 3 consecutive days
- ICU stress ulcer prophylaxis treated beyond ICU admission
- Uncomplicated H. pylori treated x 2 weeks and asymptomatic
- Barrett's esophagus
- Chronic NSAID users with bleeding risk
- Severe esophagitis
- Documented history of bleeding GI ulcer

Recommend Deprescribing

Decrease to lower dose
- Stop and use on-demand

Stop PPI

Continue PPI or consult gastroenterologist if considering deprescribing

Monitor at 4 and 12 weeks
- If verbal:
  - Heartburn
  - Regurgitation
  - Dyspepsia
  - Epigastric pain
- If non-verbal:
  - Loss of appetite
  - Weight loss
  - Agitation

Use non-drug approaches
- Avoid meals 2-3 hours before bedtime; elevate head of bed; address if need for weight loss and avoid dietary triggers

Manage occasional symptoms
- Over-the-counter antacid, H2RA, PPI, alginate prn (ie. Tums®, Rolaids®, Zantac®, Olex®, Gaviscon®)
- H2RA daily (weak recommendation – GRADE; 1/5 patients may have symptoms return)

If symptoms relapse:
- If symptoms persist x 3 - 7 days and interfere with normal activity:
  1) Test and treat for H. pylori
  2) Consider return to previous dose
**Antipsychotic (AP) Deprescribing Algorithm**

**Why is patient taking an antipsychotic?**

- Psychosis, aggression, agitation (behavioural and psychological symptoms of dementia - BPSD) treated ≥ 3 months (symptoms controlled, or no response to therapy).
- Primary insomnia treated for any duration or secondary insomnia where underlying comorbidities are managed.
- Schizophrenia
- Schizo-affective disorder
- Bipolar disorder
- Acute delirium
- Tourette’s syndrome
- Tic disorders
- Autism
- Less than 3 months duration of psychosis in dementia
- Mental retardation
- Developmental delay
- Obsessive-compulsive disorder
- Alcoholism
- Cocaine abuse
- Parkinson’s disease psychosis
- Adjunct for treatment of Major Depressive Disorder

**Recommend Deprescribing**

- **Strong Recommendation (from Systematic Review and GRADE approach)**
- **Taper and stop AP** (slowly in collaboration with patient and/or caregiver; e.g. 25%-50% dose reduction every 1–2 weeks)
- **Stop AP** Good practice recommendation

**Monitor every 1–2 weeks for duration of tapering**

- **Expected benefits:**
  - May improve alertness, gait, reduce falls, or extrapyramidal symptoms
- **Adverse drug withdrawal events** (closer monitoring for those with more severe baseline symptoms):
  - Psychosis, aggression, agitation, delusions, hallucinations

**If BPSD relapses:**

- **Consider:**
  - Non-drug approaches (e.g. music therapy, behavioural management strategies)
- **Restart AP drug:**
  - Restart AP at lowest dose possible if resurgence of BPSD with re-trial of deprescribing in 3 months
  - At least 2 attempts to stop should be made
- **Alternate drugs:**
  - Consider change to risperidone, olanzapine, or aripiprazole

**If insomnia relapses:**

- **Consider**
  - Minimize use of substances that worsen insomnia (e.g. caffeine, alcohol)
  - Non-drug behavioural approaches (see reverse)
- **Alternate drugs**
  - Other medications have been used to manage insomnia. Assessment of their safety and effectiveness is beyond the scope of this deprescribing algorithm. See AP deprescribing guideline for details.
Other Tools for Deprescribing

- PIMs/PIDs/PIP (potentially inappropriate medicines/drugs/prescribing), IPET, STOPP-START
- Beers example:

<table>
<thead>
<tr>
<th>Drug class or disease</th>
<th>Rationale</th>
<th>Recommendation</th>
<th>Quality of Evidence</th>
<th>Strength of recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIMs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antispasmodics</td>
<td>Highly anticholinergic, uncertain effectiveness</td>
<td>Avoid</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
<tr>
<td>Syncope &amp; alpha blockers</td>
<td>Increases risk of orthostatic hypotension or bradycardia</td>
<td>Avoid</td>
<td>High</td>
<td>Weak</td>
</tr>
<tr>
<td>PIMs to be used with caution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin for primary prevention of CVD</td>
<td>Lack of evidence of benefit vs. risk in ≥ 80 yrs</td>
<td>Use with caution in adults aged ≥ 80 yrs</td>
<td>Low</td>
<td>Weak</td>
</tr>
</tbody>
</table>
Bisphosphonates (alendronate/Fosamax)
Australian Guide to Deprescribing
• 1-3 years treatment – 1 fx prevented for every 40-90 pts
• 5 years of on-going of tx with oral agents will have 5 more years of benefit
  – FLEX trial – no difference in non-vertebral fx
  – Increase in vertebral fx (5.3% vs 2.4) NNT 34
• Need good renal function overall and ability to follow directions for oral med
Bisphosphonates

• For describing
  – Those at low risk of falls who have taken them for 5 years
  – <5 year life expectancy
  – No previous vertebral fx in the last 5 years

• For continuing
  – High fracture risk with T-score <2.5
  – Monitor with DEXA every 2 years.
Statins
Australian Guides to Describing

• Estimated time to benefit is 2 years
  – NNT 70-130

• Most LDL reduction benefit occurs with a low dose

• No specific studies for those over 80 years old
  – Significantly reduced MI and stroke in older people with high CV risk (without CV disease)
  – PROSPER: 3.2 year follow-up
    MI, CVA 17.4% (statin) vs 21.7% (no statin)
  – It does not prolong life in the short term

Figure 1: Effects of Statins and their doses

- atorvastatin
- fluvastatin
- pravastatin
- rosvastatin
- simvastatin

% reduction in LDL cholesterol
Statins

In Favour of Desprescribing:
- Short Life Expectancy – can improve QoL
- Poor overall functional status
- Low overall cardiovascular risk
- Side effects: muscle aches, lethargy, decreased cognition

Against Deprescribing
- Pts that are well with a >5 year life expectancy
- Those with high CVD risk (diabetes, previous MI, CVA)
Thank You.

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