

# Delirium – Management in acute hospital

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# Learning outcomes



DIAGNOSIS OF  
DELIRIUM



IMPORTANCE &  
EPIDEMIOLOGY OF  
DELIRIUM



CAUSES &  
PATHOPHYSIOLOGY



MANAGEMENT &  
CLINICAL  
APPROACH

**How would you describe a patient with delirium ?**

# Case 1

- 43 Male, on ID ward
- Diagnosis of TB Meningitis
- Auditory and visual hallucinations 'cats and dogs'
- Quite irritable and agitated at times
  - What is your clinical impression?
  - What would you do next ?

## Case 2

- 33 F, East European background
- Admitted with abdo pains – no medical cause found
- CRP high – USS is nad
- Presenting with agitation, delusional paranoid thoughts and hallucinations.
  - What is your clinical impression?
  - What would you do next ?

## Case 3

- 56 F with Schizophrenia
- Admitted with uncontrolled diabetes and leg ulcer
- Son unsure if compliant with antipsychotics
- Presenting with confusion and hallucinations
  - What is your clinical impression?
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## Case 4

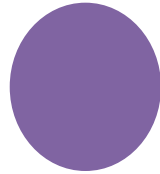
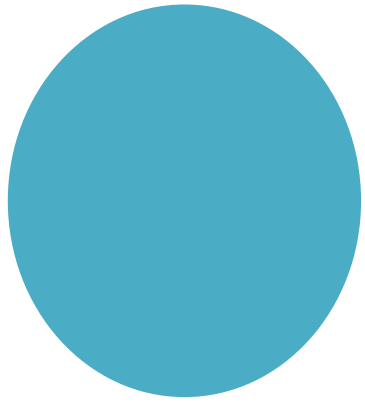
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- Admitted with Falls and UTI
- Behaving strangely and aggressive to staff
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## Case 5

- 32 F with features of tonsillitis
- Night sweats, malaise, nausea and vomiting
- Unable to tolerate oral
- Admitted for IV antibiotics
- WCC 19+ CRP 288
  
- 'Alice in wonderland' symptoms (Macropsia)
  - What is your clinical impression?
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## Case 6

- 30F recently moved from Indonesia
- Admitted with Pyelonephritis
- CRP 268, WCC 18+
- On IV antibiotics
- Hearing voices + delusions
  
- What is your clinical impression?
- What would you do next ?



# Diagnosis





# Concepts and issues

- Marker of acute brain injury
- Peripheral/systemic illness, or drugs
- Level *and* content of consciousness
- Features debatable: attention, cognition, consciousness
- Measurement still problematic
- Mechanisms largely unknown
- Accelerated dementia?

# DSM-5 criteria (May 2013)

- A. A disturbance in attention (i.e. reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment)
- B. The develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day.
- C. An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability, or perception)
- D. The disturbances in criteria A and C are not better explained by another preexisting, established, or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma.
- E. [Evidence ... direct physiological consequence of another medical condition, etc.]

# Screening tools - 4 "A"s Test (4AT)

## **[1] ALERTNESS**

*This includes patients who may be markedly drowsy (eg. difficult to rouse and/or obviously sleepy during assessment) or agitated/hyperactive. Observe the patient. If asleep, attempt to wake with speech or gentle touch on shoulder. Ask the patient to state their name and address to assist rating.*

Normal (fully alert, but not agitated, throughout assessment)	0
Mild sleepiness for <10 seconds after waking, then normal	0
Clearly abnormal	4

## **[2] AMT4**

*Age, date of birth, place (name of the hospital or building), current year.*

No mistakes	0
1 mistake	1
2 or more mistakes/untestable	2

## **[3] ATTENTION**

*Ask the patient: "Please tell me the months of the year in backwards order, starting at December."  
To assist initial understanding one prompt of "what is the month before December?" is permitted.*






Months of the year backwards	Achieves 7 months or more correctly	0
	Starts but scores < 7 months / refuses to start	1
	Untestable (cannot start because unwell, drowsy, inattentive)	2

## **[4] ACUTE CHANGE OR FLUCTUATING COURSE**

*Evidence of significant change or fluctuation in: alertness, cognition, other mental function (eg. paranoia, hallucinations) arising over the last 2 weeks and still evident in last 24hrs*

No	0
Yes	4

# Dementia vs delirium - Clinical features

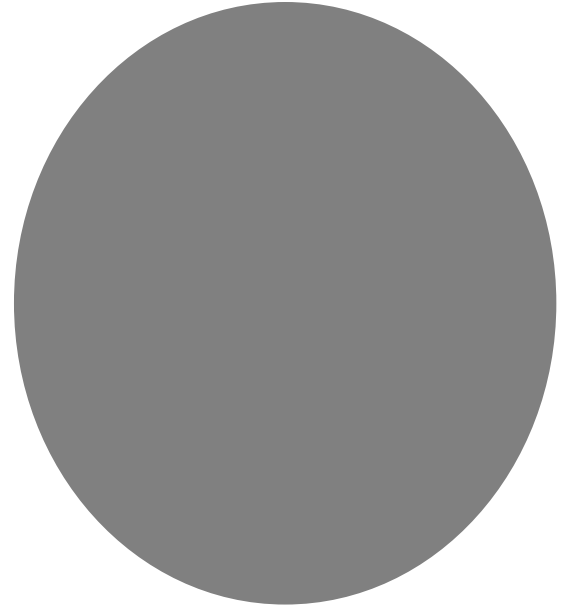
- Impaired consciousness, with clouding of consciousness. 
- Disorientation in time, place, person
- New Learning impaired
- Disorganised thinking.
- Diurnal fluctuations 
- Sleep-wake cycle disturbed 
- EEG – diffuse slow wave pattern 
- Hypoactive apathetic picture vs overactive 
- Psychotic phenomena inc. visual hallucinations

# Clinical Diagnosis

- History – from patient, from carers, from relatives, from old notes, from OT/physio (could do OT tasks last week, not now).
- Aim to have a clear timeline of behaviour, ADL function and cognition before admission, precipitants for admission and during admission.
- Try to elicit mood, abnormal perceptions, test cognition, insight

# Importance & Epidemiology

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# Why delirium matters

- ❑ Common 15% hospital >65
- ❑ Serious 20% mortality (same as anterior STEMI)
- ❑ Marker for dementia 60% underlying
- ❑ Costly £13k / admission
- ❑ Distressing (“ICU PTSD”)
- ❑ Loss of independence (Cole et al, 2009)
- ❑ Worsening of cognition (Fong et al 2009)

"On Sunday, I was on the ICU, where a horror ceremony like in a concentration camp was going on. Four patients were executed. Laying in their beds, they received a death pill. I was one of them. ... The hangman gave us the pill, with a blank face... waiting to carry away our dead bodies. ... The torturers watched us all the time, they asked us: "Do you feel anything yet? How does your foot feel? How does your arm feel?" The scene went on like a horror film. The children of Satan were in command. They were dressed in green coats and had scary faces. They were waiting for our death. ... Worst was, that I did not try to resist. How can a man throw away his life like that? Why me? Did they do a mistake during the surgery and try to cover it up by killing all of us? ... The pills did not work. I did not die. So they tried it again with gas, pressing a mask on my face. ..."



## Delirium: long-term outcomes

### Systematic review of hospital cohorts Outcomes

- Death HR 2.0
- Dementia OR 13


(Witlox (2010) JAMA systematic review and meta-analysis).

*But selection bias?*

*But undiagnosed dementia?*

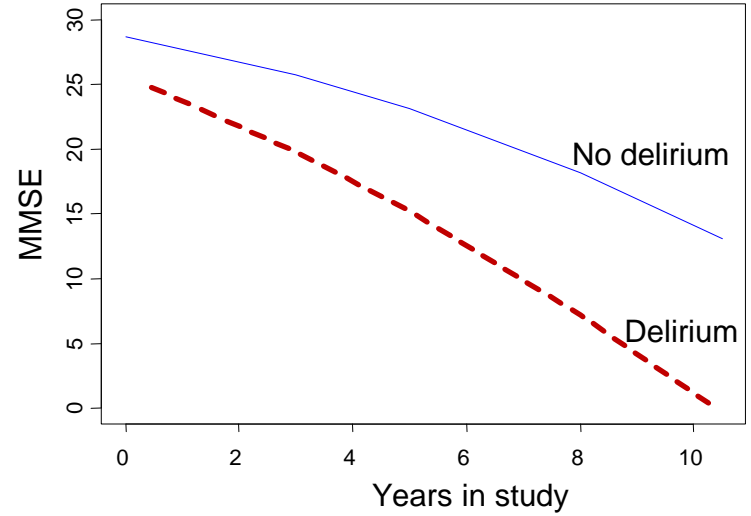
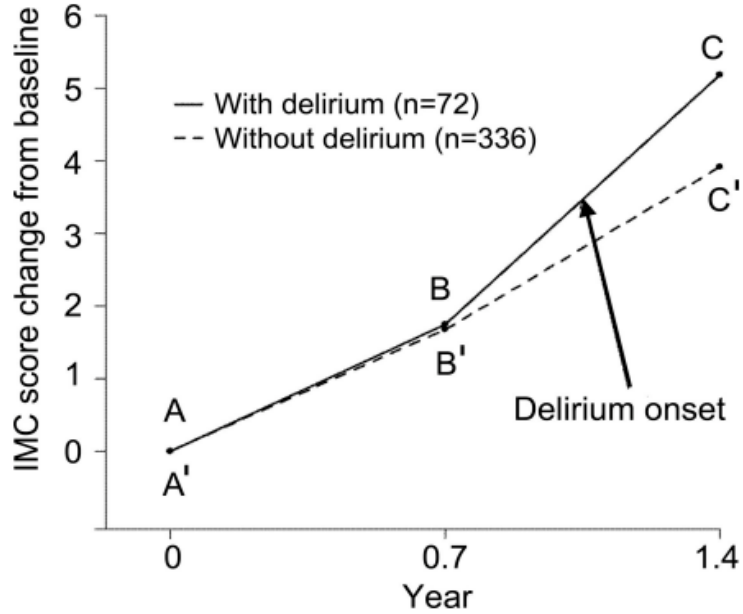
## A central question

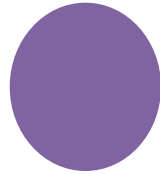
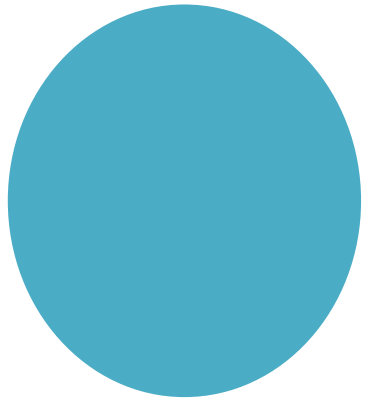
?

Delirium  cognitive decline

1. Unmask an unrecognised dementia?
2. Lead to chronic cognitive impairment?

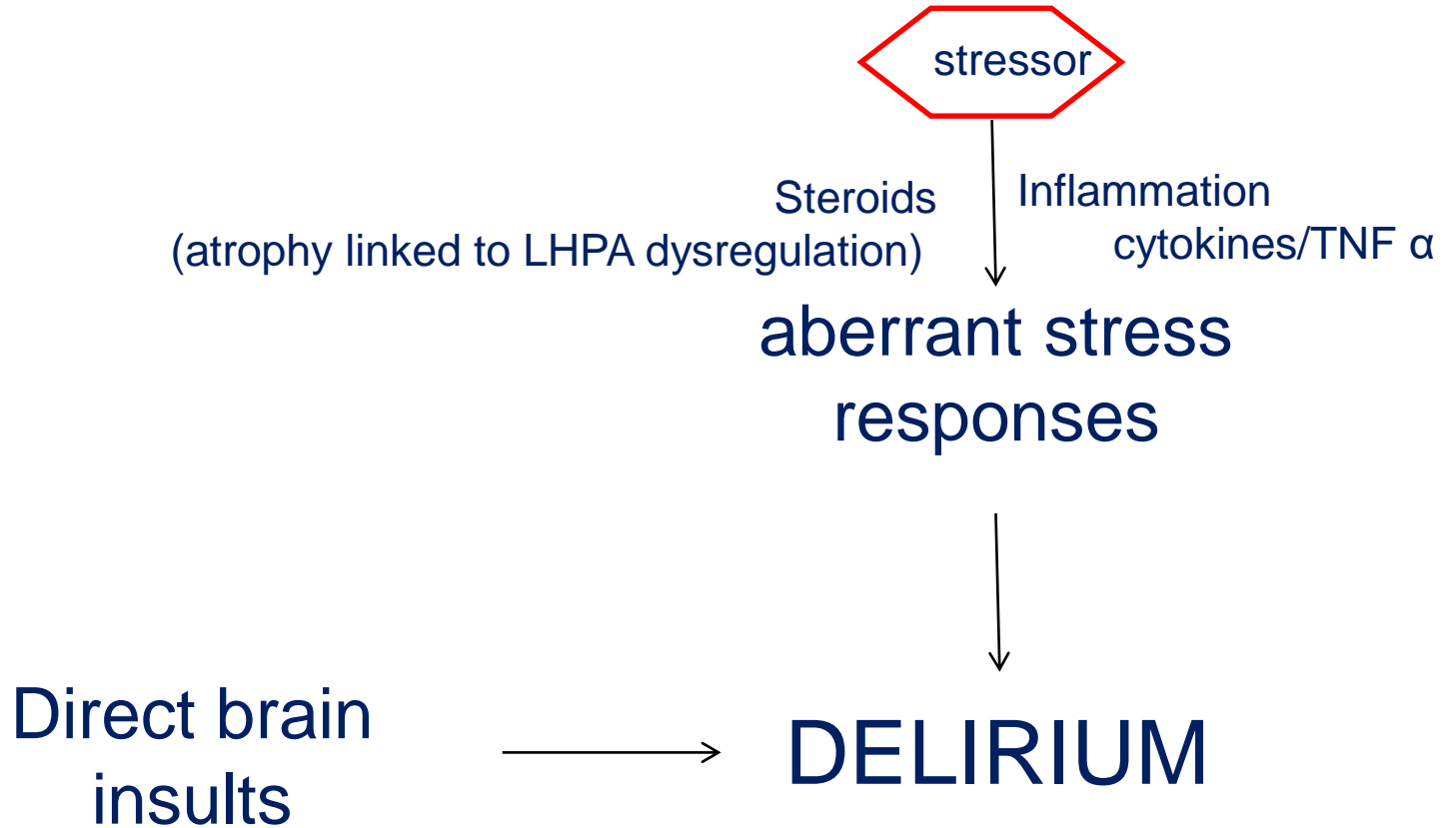
The most common problem in acute geriatric medicine and a public health challenge costing £26 billion



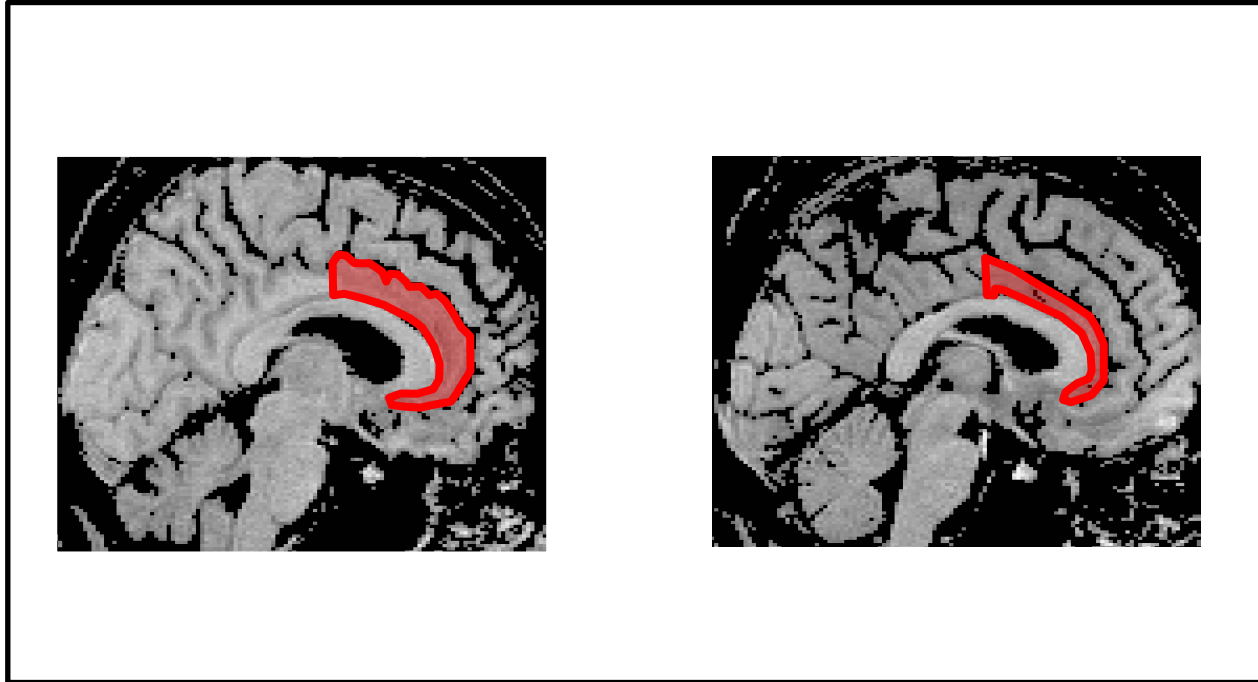


# **Causes and Pathophysiology**



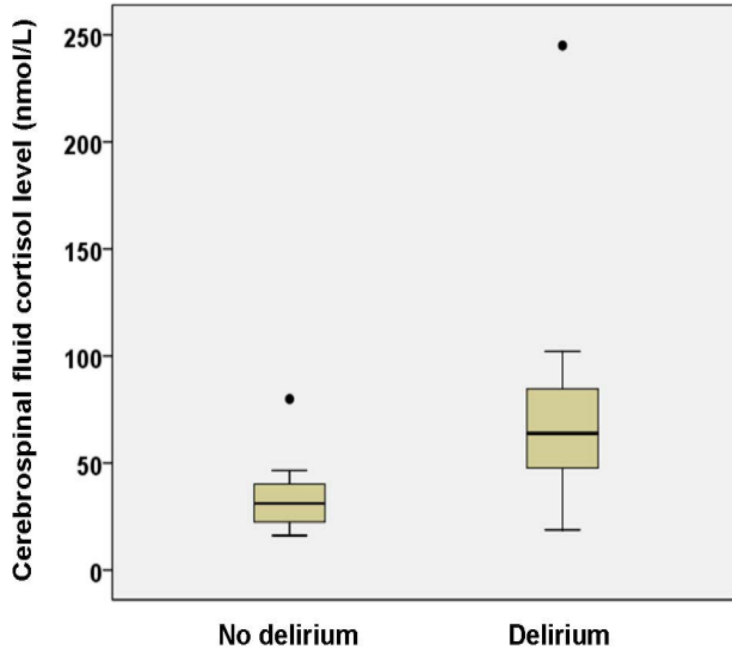


# Atrophy is associated with LHPA dysregulation

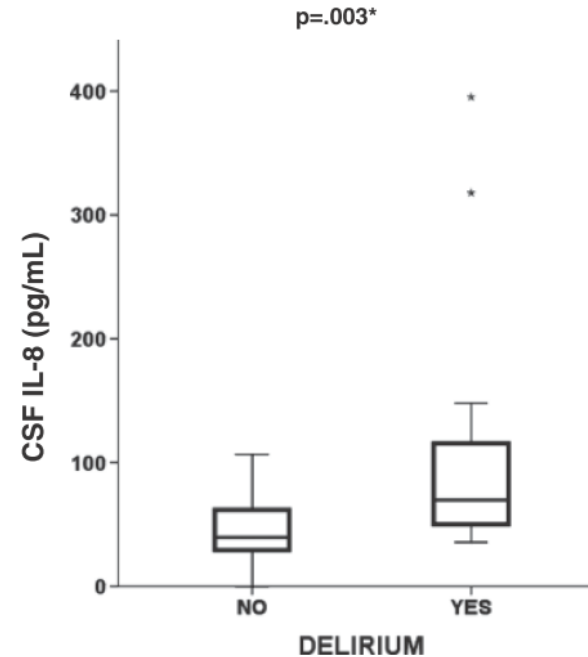


# Biomarkers of delirium microglia activation and Alzheimers-like actions

## CSF cortisol



## CSF inflammatory cytokines



# Management and Clinical approaches



Patient name: \_\_\_\_\_

Date: \_\_\_\_\_

## GPCOG Screening Test

### Step 1: Patient Examination

Unless specified, each question should only be asked once

#### Name and Address for subsequent recall test

- "I am going to give you a name and address. After I have said it, I want you to repeat it. Remember this name and address because I am going to ask you to tell it to me again in a few minutes: John Brown, 42 West Street, Kensington." (Allow a maximum of 4 attempts).

#### Time Orientation

- What is the date? (exact only)

Correct    Incorrect

#### Clock Drawing – use blank page

- Please mark in all the numbers to indicate the hours of a clock (correct spacing required)
- Please mark in hands to show 10 minutes past eleven o'clock (11.10)

#### Information

- Can you tell me something that happened in the news recently? (Recently = in the last week. If a general answer is given, eg "war", "lot of rain", ask for details. Only specific answer scores).

#### Recall

- What was the name and address I asked you to remember

John  
Brown  
42  
West (St)  
Kensington


(To get a total score, add the number of items answered correctly)  
**Total correct** (score out of 9)

/9

If patient scores 9, no significant cognitive impairment and further testing not necessary.

If patient scores 5-8, more information required. Proceed with Step 2, informant section.

If patient scores 0-4, cognitive impairment is indicated. Conduct standard investigations.

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## MONTREAL COGNITIVE ASSESSMENT (MOCA)

Version 7.1 Original Version

NAME: \_\_\_\_\_  
Education: \_\_\_\_\_ Sex: \_\_\_\_\_  
Date of birth: \_\_\_\_\_ DATE: \_\_\_\_\_

<b>VIUOSPATIAL / EXECUTIVE</b>					Draw CLOCK (Ten past eleven) (3 points)		POINTS				
						Copy cube					
[ ]						[ ]		[ ] /5			
<b>NAMING</b>											
[ ]			[ ]			[ ]					
<b>MEMORY</b>											
Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.						FACE	VELVET	CHURCH	DAISY	RED	No points
1st trial											
2nd trial											
<b>ATTENTION</b>											
Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order [ ] 2 1 8 5 4						Subject has to repeat them in the backward order [ ] 7 4 2					
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors [ ] FBACMNAAJKLBFAKDEAAAJAMOF AAB						[ ]					
Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65						4 or 5 correct subtractions: <b>3 pts.</b> 2 or 3 correct: <b>2 pts.</b> 1 correct: <b>1 pt.</b> 0 correct: <b>0 pt</b>					
<b>LANGUAGE</b>											
Repeat: I only know that John is the one to help today. [ ] The cat always hid under the couch when dogs were in the room. [ ]						[ ]					
Fluency / Name maximum number of words in one minute that begin with the letter F [ ] _____ (N ≥ 11 words)						[ ]					
<b>ABSTRACTION</b>											
Similarity between e.g. banana - orange = fruit [ ] train - bicycle [ ] watch - ruler						[ ]					
<b>DELAYED RECALL</b>											
Has to recall words WITH NO CUE [ ]						FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only
Category cue						[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Multiple choice cue											
<b>Optional</b>											
<b>ORIENTATION</b>											
[ ] Date		[ ] Month		[ ] Year		[ ] Day		[ ] Place		[ ] City	
[ ]						[ ]		[ ]		[ ] /6	
© Z.Nasreddine MD						www.mocatetest.org		Normal ≥ 26 / 30		TOTAL _____ /30	
Administered by: _____						Add 1 point if ≤ 12 yr edu					

# Abbreviated Mental Test score - AMT

Abbreviated Mental Test score	
Age?	0 points - Incorrect 1 point - Correct
2. Time? (to nearest hour)	0 points - Incorrect 1 point - Correct
3. Address for recall at end of test (this should be repeated by the patient to ensure it has been heard correctly): "42 West Street"	
4. Year?	0 points - Incorrect 1 point - Correct
5. Name of this place?	0 points - Incorrect 1 point - Correct
6. Identification of two persons (doctor, nurse, etc)?	0 points - Incorrect 1 point - Correct
7. Date of birth?	0 points - Incorrect 1 point - Correct
8. Year of First World War?	0 points - Incorrect 1 point - Correct
9. Name of present Monarch?	0 points - Incorrect 1 point - Correct
10. Count backwards 20 to 1	0 points - Any error 1 points - No errors
Address recall correct?	0 points - Incorrect 1 points - Correct
Abbreviated mental test score = /10	

## Other screening tools

- CAM-COG

validated for critical care

15 item

- 4AT

4 item, validated to be used by non-qualified staff

- OSLA

Observational Scale of Level of Arousal

5 item – just the arousal component of delirium

# Clinical Institute Withdrawal Assessment of Alcohol Scale, Revised (CIWA-Ar)

- Use CIWA to help diagnose Delirium Tremens
- Caution must be used in the elderly , those with diabetes, sepsis, neuropathies etc that affect the autonomic nervous system
- This group of users may not show typical physical manifestations of alcohol withdrawal (eg heart rate, blood pressure, and temperature)
- The only manifestations of withdrawal may be a change in mental status. By this time, they may have already progressed into the late stages of alcohol withdrawal and be more difficult to treat (and be at higher risk of death).

[Prim Care Companion J Clin Psychiatry](#). 2006; 8(3): 170–173.

# Features of withdrawal on CIWA

- Nausea/vomiting
- Headache
- Tremor
- Paroxysmal Sweating
- Tactile disturbances
- Auditory disturbances
- Visual disturbances
- Anxiety
- Agitation
- Clouding of consciousness

# Treat the causes of delirium

- A – alcohol, anaemia
- E – electrolytes, epilepsy, endocrine
- I – infection, intoxication
- O – overdose, oxygen, other (!)
- U - uraemia
- D – drugs, deficiency
- V – vascular, vasculitis
- T – tumour, trauma
- Don't assume anything
- Other mnemonics are available

# Causes that people forget

- Pain
  - Constipation
  - Sensory deprivation
  - Multiple causes!
- 
- REVERSE THE CAUSE & DELIRIUM WILL RESOLVE
  - May take 3-6 months

# Risk factors

Dasgupta et al (2010)

- Existing cognitive impairment
- Multiple comorbidities, especially addiction
- Hypoactive delirium
- Hypoxic illness
- Targeting these groups and optimising treatment (eg nutrition) may improve outcome



# Avoidance

- Avoidance – local nerve block + propofol for #NOF repair
- Clonidine infusion on induction and wean of ventilation
- Nurse in quiet side room/ bay with light mirroring natural daylight (or natural daylight) (Ono et al 2011)
- Re-orientation measures – family, familiar objects, clock, use of signs

# Restraining patients increases disturbance

Spot the difference between the images?



Is the ward environment inducing paranoia?



# Treatment

- Rationalise medication (Lapane et al 2011)
- Reduce cholinergic burden
- Treat bowels and pain
- Complex intervention with above showed benefit (Boorsma et al 2011)

# Some drugs that worsen delirium

- Tricyclics
- Oxybutynin
- Cimetidine, Ranitidine
- Prednisolone
- Digoxin
- Chlorpheniramine
- Furosemide
  - Anticholinergic – any
  - Any sedative

# Approaches to choosing medication

- Consider the delirium patients as either:
  - Alcohol withdrawal related (+/- dementia): Pabrinex, chlordiazepoxide
  - Established dementia diagnosis
  - Non-dementia, non-alcohol
- In patient with established dementia consider risks of antipsychotics and consider treating as Behavioural and psychological symptom of dementia
  - Associated with a significant increase in mortality risk (1.5- to 1.8-fold), by falls and stroke RR 2.7: haloperidol worse
  - Risk of tardive dyskinesia with typicals and extrapyramidal side effects
  - Antipsychotics can cause severe EPSEs and autonomic collapse in Lewy Body & Parkinsons

## Medication – non-alcohol related

- Single agent with non-drug methods
- Start low, go slow, less is more
- Haloperidol and Olanzapine recommended by NICE but at expert opinion level of evidence only
- Alternative Lorazepam – controversial study showing worse outcome in ICU patients, not effective for psychotic symptoms
- Melatonin 0.5-2mg ON – in HDU/ICU patients

## The drugs don't work (?)

- Over-sedation increases agitation and brings with it risk of aspiration pneumonia, falls and thrombosis
- Benzodiazepines –lorazepam was shown to worsen outcome in ICU patients
- Rivastigmine increased deaths in ICU (patients not already on rivastigmine)
- Caution with parental Olanzapine
- Caution in prolonged QTc
- Caution with post MI patients and haloperidol  
(increased mortality vs atypicals Park et al, BMJ 2018;360:k1218)



# Case studies



# Case 1

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# Guess what this is !!

<https://youtu.be/jcZUPDMXzJ8>



PUB

B  
I  
E  
R  
K  
E

# Summary

- Delirium: single biggest challenge in general medicine / liaison psychiatry
- Significant pathophysiological change involving microglia – increased risk of dementia/ acceleration of dementia
- Key to diagnosis is in the history (patient + collateral), reading medical notes / investigations and having an index of suspicion