# Cognitive impairment in the ED

UofA Emergency Medicine Residents

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# Objectives

1. Describe the 3 D's of cognitive impairment
2. Use screening tools to assess for delirium, dementia, depression. Assess and document a patients mental status.
3. Formulate a differential diagnosis for an older patient with new cognitive or behavioral impairment
4. Initiate a diagnostic workup to determine etiology for delirium
5. List non-pharmacologic and pharmacologic strategies to manage delirium patients, both agitated and hypoactive.
6. Identify preventative strategies in the emergency department to decrease the risk of precipitating delirium

# Delirium

# Why does delirium matter?

- We miss 65-85% of cases in the ED.
- May be only sign/symptom of underlying medical condition
- Increase hospital LOS, repeat ED visits, repeat admissions, functional decline, cognitive decline, discharge to facility
- Associated with increased mortality
  - Independent predictor of 6-month mortality
  - Increased 7-day and 30-day mortality

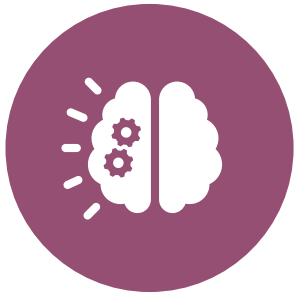
Mariah et al., 2023; Han et al., 2010; McCusker et al., 2001; Emond et al., 2018; Lewis et al., 1995

# Who's at risk of delirium

History of cognitive impairment

Visual or hearing impairment

From LTC/nursing home facility



History of stroke

E Silva et al., 2021

# Delirium subtypes

## Hyperactive delirium

Predominantly restless and agitated

- Increased motor activity
- Loss of control of activity
- Restlessness
- Wandering

## Mixed motor type

Evidence of both subtypes in the previous 24 hours

## Hypoactive delirium

Commonly mistaken for depression or dementia

Predominantly drowsy and inactive

- Decreased activity
- Decreased action speed
- Decreased speed of speech
- Decreased amount of speech
- Reduced awareness of surroundings
- Listlessness
- Withdrawal

BMJ, 2017

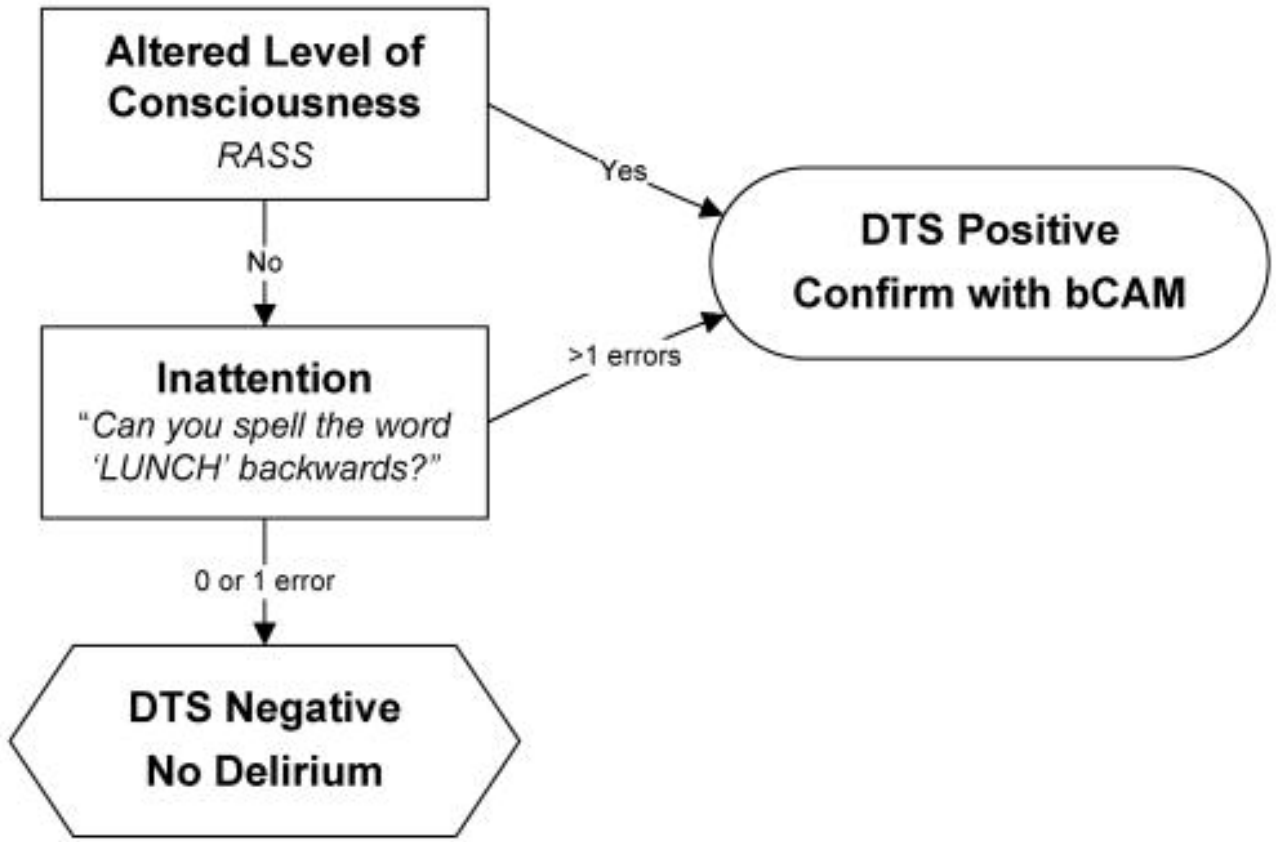
# Delirium screening tools in the ED

| | Sensitivity | Specificity | Time to complete |
|---|---|---|---|
| **CAM** | 94% | 90% | 5 minutes |
| **DTS** | 98% | 55% | <20 seconds |
| **bCAM** | 84% | 96% | <2 minutes |
| **4AT** | 88% | 88% | <2 minutes |
| **CAM-ICU** | 72% | 99% | <2 minutes |

Mariz et al., 2016; Han et al., 2013; Tieges et al., 2021

# Step 1: Delirium Triage Screen

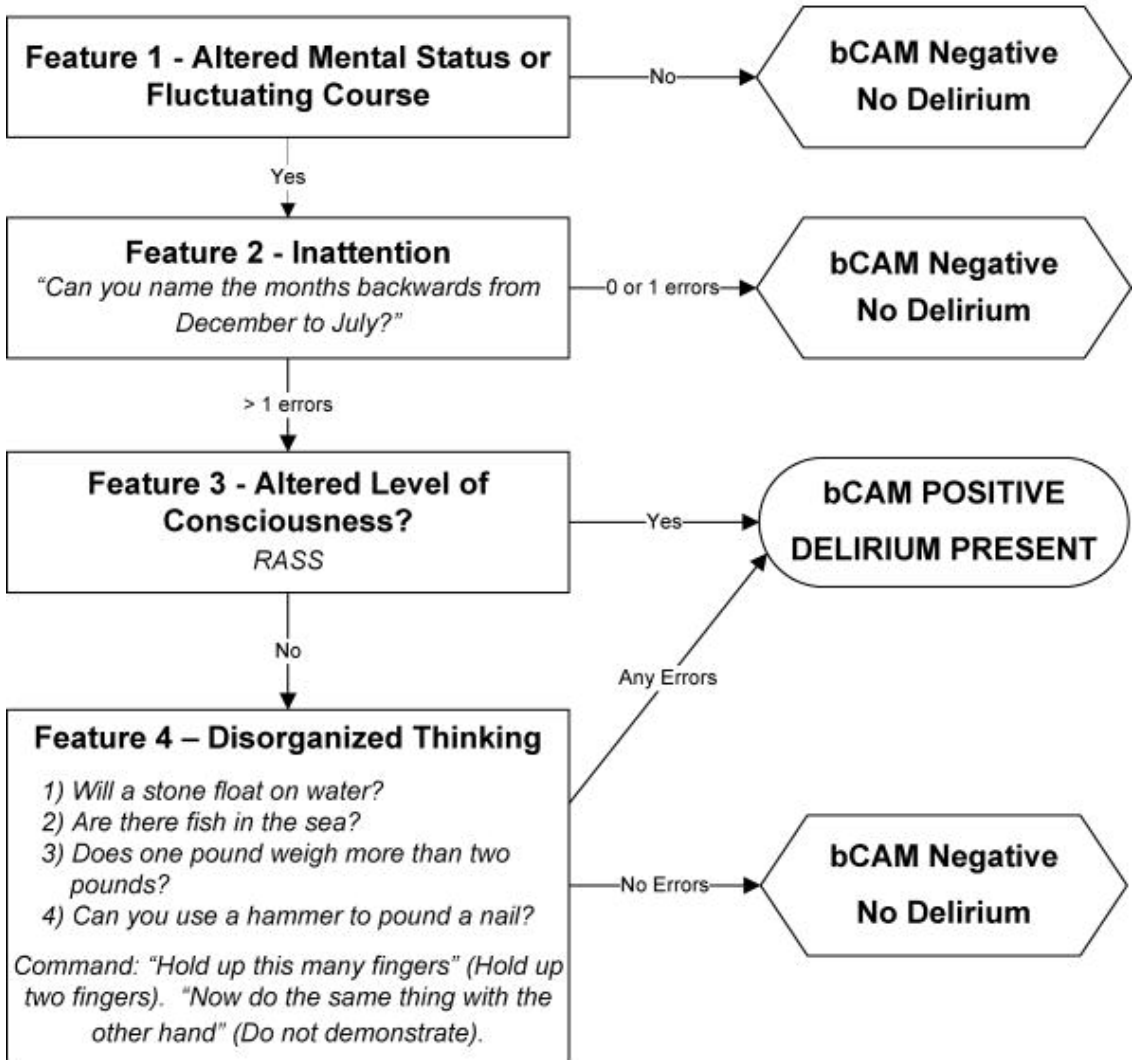
## Rule-out Screen: Highly Sensitive




Han et al. 2013

# Step 2: Brief Confusion Assessment Method

## Confirmation: Highly Specific




Han et al. 2013

# Screening positive, now what?

Delirium is a symptom of an underlying condition. Your job is to identify the underlying condition.

## Causes

- DRUGS – medications; substance use; withdrawal
- INFECTION/INFLAMMATION – common infections, ACS
- METABOLIC – electrolyte abnormalities, hypoglycemia, hypoxia, hypercarbia, encephalopathy, renal failure
- STRUCTURAL – ICH, TIA/CVA, seizures
- OTHER – urinary retention, untreated pain, constipation/fecal loading

## Investigations

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## Investigations

- Complete physical exam + history
- CBC, lytes, extended lytes, Cr/BUN, troponin
- ECG
- Consider: liver function tests, TSH, VBG, tox screen
- For concern of infection: blood cultures, CXR, COVID swab, +/- urine studies*
- PVR
- CT head*
- Consider AXR to assess fecal loading
- Medication review

# Management (and prevention) of delirium

NON-PHARMACOLOGIC

- Avoid restraints/tethers
- Promote mobility
- Re-orient (clock, sitter, whiteboard)
- Allow food and drink
- Treat pain
- Sensory stimulation (hearing/visual aids)
- Create sleep pattern
- Order important home meds, avoid deliriogenic meds


Cochrane Review 2021

# Management of delirium

PHARMACOLOGIC

- Only try after non-pharmacological options
- Only for dangerous behaviors
- Prioritize PO vs SC/IV/IM
- Start low, go slow
- If there are on an antipsychotic medication at baseline, then continue this first!
- Consider contraindications: Parkinson's

**Potential benefits of antipsychotics:**

- NNT ~5-14
- Effect size 0.12-0.2

**Be aware of risks of pharmacological treatment with antipsychotics:**

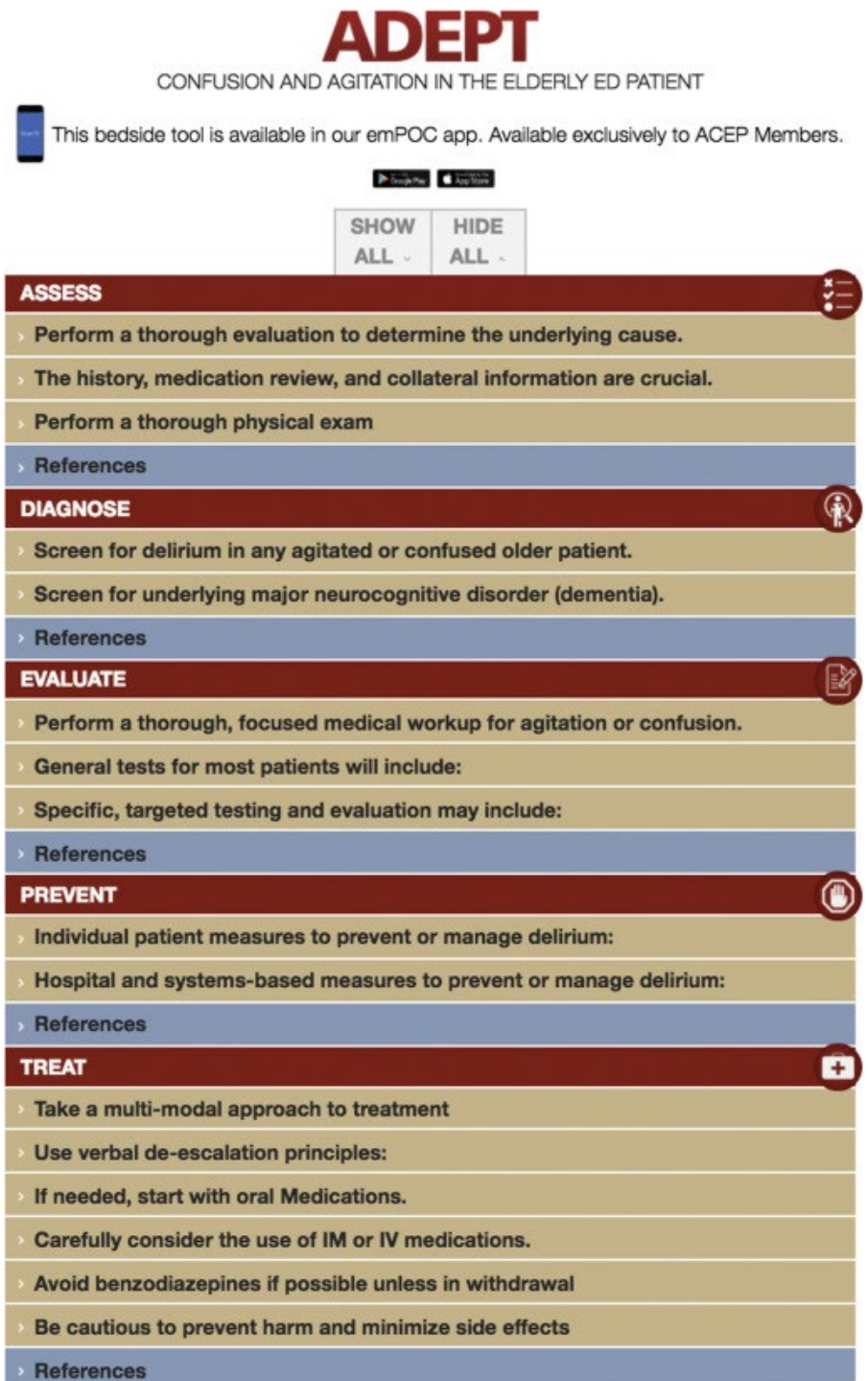
- Side effects: sedation, falls, postural hypotension, long QTc, confusion, EPS
- Health Canada advisory found 1.6 fold increase in mortality.
- Increased risk of stroke and death: NNH 100

| | Drug<br>**Generic** (Brand) | Efficacy or evidence in BPSD therapy | ↑BP[32] | Ach | Sedation | EPS | TD[33] | Diabetes | Weight Gain[27] | Usual Dose | $/Month |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Atypicals | **Risperidone*** (Risperdal)[25, 26, 34] | • Indicated for severe dementia of the Alzheimer type (Health Canada)<br>• Evidence for efficacy in agitation, aggression & psychosis | ++ | ++ | ++ | ++ | + | ++ | ↑↑↑ (0.7lb/ month) | 0.125mg – 2.0mg/d QHS (or divided BID) | $10-27 |
| | **Olanzapine*** (Zyprexa)[25, 26, 34] | • Off-label use in BPSD<br>• Evidence for efficacy in agitation & aggression | + | +++ | +++ | ++ | + | +++ | ↑↑↑ (1.0lb/ month) | 1.25mg – 7.5mg/d | $17-38 |
| | **Aripiprazole*** (Abilify)[34] | • Off-label use in agitation or aggression[18]<br>• Evidence for efficacy in agitation & aggression<br>• Not eligible for dementia or BPSD in the elderly(ODB criteria, Therapeutic Note)<br>• Not for psychosis(same as placebo) | + | + | ++ | + | + | – | ↑ | 2.0mg – 12.5mg QHS | $112-260 |
| | **Quetiapine** (Seroquel)[25, 26, 34] | • Off-label use in BPSD<br>• Lacks evidence for efficacy in BPSD agitation, aggression & psychosis<br>• Consider in Lewy Body dementia, Parkinson's (low EPS)<br>• Note: although used, not indicated, and lacking evidence for insomnia | ++ | +++ | +++ | + | + | +++ | ↑↑ (0.4lb/ month) | 12.5mg – 200mg/d (divided QHS-TID) | $10-59 |
| Typicals | **Haloperidol** (Haldol) | • Useful short term in acute BPSD or delirium | + | + | + | +++ | +++ | ++ | ↑↑ | 0.25mg – 2.0mg/d | $14-25 |
| | **Loxapine** (Loxapac, Xylac)[2] | • Consider if other agents have failed and severe, persistent, dangerous behaviour continues<br>• Severe, acute BPSD<br>• Not to be used long-term due to adverse effects | ++ | ++ | +++ | +++ | +++ | + | – | 5.0mg – 10mg BID | $18-27 |

Centre for Effective Practice, 2016

# ACEP ADEPT tool for use in ED

https://www.acep.org/patient-care/adept/



# Dementia

# Dementia is not part of normal aging.

**Normal age changes:**

- Reduced volume
- Some neuronal cell death
- Myelin sheath deterioration
- Dysregulation of neurotransmitters

Peters R., 2006

# Dementia diagnosis

## Domains affected by dementia

- Learning & memory
- Language
- Complex attention
- Executive function
- Perceptual motor function
- Social cognition

## Diagnostic criteria (DSM-5) for dementia

- Cognitive decline in 1 or more cognitive domain
- Insidious onset and gradual progression
- Deficits do not occur exclusively during course of delirium
- Deficits not better explained by another mental disorder

(Rosens Box 94.3)

# 7 A's of Dementia

1. Anosognosia (deficit of self- awareness/lack of insight)
2. Amnesia (memory loss)
3. Aphasia (inability to comprehend and formulate language)
4. Agnosia (inability to process sensory information)
5. Apraxia (motor disorder)
6. Altered perception (misinterpretation of information)
7. Apathy (lack of feeling, emotion, interest and concern)

# Types of Dementia

**ALZHEIMERS DEMENTIA**

- Most common cause
- Cortical atrophy w/ deposition of B-amyloid protein and neurofibrillary tangles → senile plaques
- Decrease in acetylcholine
- Memory impairments
- Slowly progressive

**FRONTOTEMPORAL DEMENTIA**

- Progressive damage to frontal and/or temporal lobes
- Behavioral changes
- Language changes
- Apathy
- Rapid progression

**LEWY BODY DEMENTIA**

- Development of Lewy bodies inside neurons
- Visual hallucinations
- Parkinsonism
- Fluctuation in mental state
- Sleep disturbances (REM sleep disorder)
- Rapid progression

**VASCULAR DEMENTIA**

- 2nd most common cause
- Cortical and sub-cortical infarcts
- Step-wise cognitive decline
- Patients have risk factors for atherosclerosis

## Psychosis

Delusions
Hallucinations
Misidentification
Suspicious

## Aggression

Defensive
Resistance to care
Verbal
Physical

## Agitation

Dressing/undressing
Pacing
Repetitive actions
Restless/anxious

## Depression

Anxious
Guilty
Hopeless
Irritable/screaming
Sad, tearful
Suicidal

## Mania

Euphoria
Irritable
Pressured speech

## Apathy

Amotivation
Lacking interest
Withdrawn

# BPSD

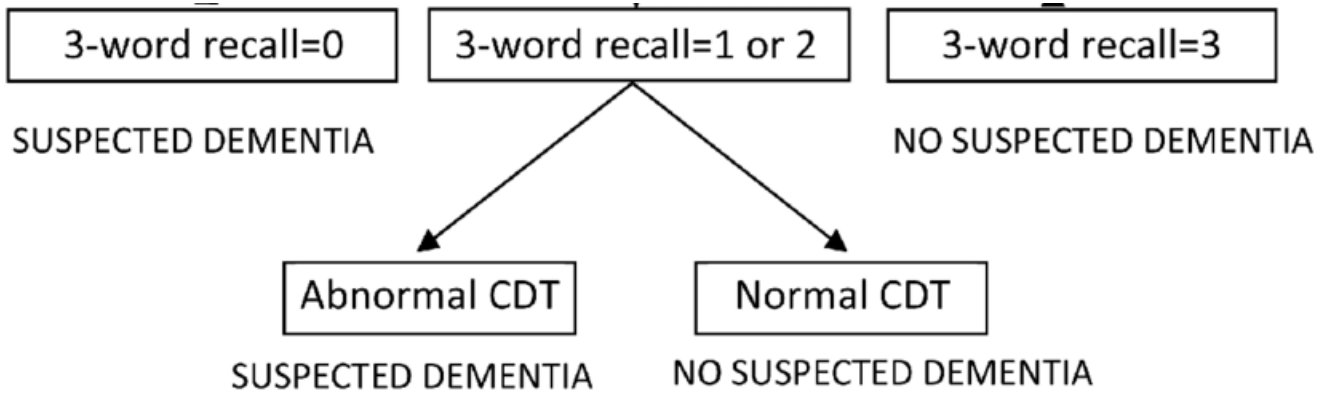
Centre for Effective Practice, 2016

# Dementia screening in ED

1. Not intending to give diagnosis of dementia
2. Screening to help connect patient to additional care/supports from the ED
3. Tests in ED include:
    1. Mini-cog
    2. Short blessed test
    3. Ottawa 3DY
    4. AMT-4
    5. Brief Alzheimer's screen (BAS)

## Mini-Cog

1. Have patient repeat and remember 3 words. E.g. apple, table, penny
2. Give paper with circle on it and ask patient to place numbers and put hands at "ten after eleven"
3. Get patient to repeat 3 words



# Suspected cognitive impairment in the ED

How you can help improve care

Involve family/caregiver, family physician etc.

Written discharge plan

Home care referrals

Caregiver supports

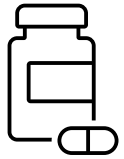
# Dementia Medication Awareness

Cholinesterase inhibitors:

- Donepezil
- Rivastigmine
- Galantamine

NMDA-receptor antagonist:

- Memantine



Cholinesterase inhibitors:

- Nausea and diarrhea
- Anorexia, weight loss
- Bradycardia, heart block, syncope
- Sleep disturbances

Memantine:

- Confusion, hallucinations
- Dizziness
- Headache

# Depression

1. Atypical symptoms: somatic symptoms, anxiety, irritability
2. Rationalization of depressive symptoms by patient/family
3. Late-onset depression associated more with neuro abnormalities, risk for dementia
4. Higher number of suicide deaths in older adults compared to other age groups, and suicide attempts more likely to be successful

Taylor, 2014; Grossberg et al, 2017

# Depression screening in the ED

- GDS and PHQ - traditional screening tools. Too long for ED use.
- ED Depression Screening Instrument (**ED-DSI**):
  - Validated in ED
  - SN 79%, SP 66%
  - Positive if any of the 3 questions are YES
  - Not to diagnose MDD
  - Screening tool to identify need for supports/safety evaluations

| Question | Response | |
|---|---|---|
| 1. Do you often feel sad or depressed? | Yes | No |
| 2. Do you often feel helpless? | Yes | No |
| 3. Do you often feel downhearted and blue? | Yes | No |

Fabacher et al, 2002

# Questions?