Delirium
Assessment and management in relation to falls risk in hospital

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A house call - Mrs JM

- 95-year-old lady
- Normally cognitively intact
- Multiple medical problems, including falls
- Housebound, mobile with frame, no carers
- Acutely unable to get out of armchair
- Incontinent in the chair
- Irritable and increasingly agitated
- Occasionally drowsy, losing train of thought
Mrs JM

- After some time…
- More drowsy, rambling speech
- Episodes of orientated lucidity
- Admitted to hospital
- Comprehensive assessment in ED
- Diagnosis of delirium secondary to acute kidney injury, E coli sepsis
- Responded to treatment, eventually
Acute Care of Older People

- Delirium
- Falls
- Immobility

- Multi-morbidity
- Dementia
- Frailty
Mrs JM

- Delirium
- Frailty
- Falls
- Immobility

Multi-morbidity
Dementia
Mrs JM = My late grandmother

- Delirium
- Immobility
- Falls

- Multi-morbidity
- Dementia
- Frailty
Delirium, falls and acute care

- What is delirium?
- What causes delirium?
- What links falls and delirium?
- Identification
- Prevention
- Management
What is delirium?

- *Deliriare* – to become crazy or rave
- *De* – away from, *lira* - furrow
  - acute confusion
  - acute brain failure
Diagnosis of Delirium

A. Disturbance of consciousness with reduced ability to focus, sustain, or shift attention.

B. A change in cognition (memory, language, or orientation) or the development of a perceptual disturbance not better accounted for by a dementia.

C. Disturbance develops over hours or days and fluctuates during course of day.

D. Evidence from history, physical, or lab findings that disturbance is caused by direct physiological consequences of a general medical condition.

DSM-IV
What causes delirium?

- Poorly understood and under-researched
  - Hard to define
  - Variety of symptoms and severity
  - Multiple predisposing and precipitating factors
  - CNS relatively difficult to access, until recently
  - Animal models of limited use
  - Ethics and funding for research when capacity lacking
- Global impairment of cerebral function due to neurotransmitter imbalance and synaptic dysfunction
- Usually caused by insults to a vulnerable brain
Multifactorial Model for Delirium (from Inouye 2006)
Delirium in hospital

Very common

• Prevalence (on admission) 14-24%
• Incidence (in hospital) 6-56%
• Postoperative 15-53%
• Intensive care unit 70-87%

• More frequent with increasing age (3x over 65)
• Not exclusive to medical wards

Inouye SK, NEJM 2006;354:1157-65
Outcomes

- In-hospital mortality: 22-76%
- One-year mortality: 35-40%
  - Studies are difficult to interpret (confounded by dementia and severe illness)
  - Increased length of stay
  - Increased risk of falls
- 1.95 HR of death at 27 months
- Greater risk of death if delirium is missed
- 2.41 OR of admission to long term care
- 12.54 OR of dementia at 4 years

Witlox J, JAMA (2010)
Delirium and falls

Delirium is the key risk factor for falls in hospital

Common risk factors for falls and delirium:

• Increasing age
• Multi-morbidity
• Immobility
• Medication (sedatives and anti-cholinergics)
• Cognitive impairment
• Sensory impairment
• Dehydration / postural hypotension

Management of delirium and falls should overlap
Identification of delirium
Is it acute?

• Get a collateral history
• Someone who knows the patient well
• Sooner the better

• When did it start?
• What were they like yesterday, a week ago?
• Has it happened before?
• What else have you noticed?
Is it delirium?

- Differential diagnosis for confusion
- Dementia
- Dysphasia
- Deaf
- Drunk
- Drugged
- Depressed
- Downright difficult

"poor historian"
Delirium sub-types

- Hyperactive (20%)  
  "Confused"
  Agitated, hyper-alert, restless
- Hypoactive (30%)  
  "Not themselves"
  Drowsy, inattentive, poor oral intake
- Mixed (50%)  

Hypoactive delirium carries higher mortality and is more often unrecognised

“Respecting the movement of the hands, I have these observations to make:

When in acute fevers, pneumonia, phrenitis, or headache, the hands are waved before the face, hunting through empty space, as if gathering bits of straw, picking the nap from the coverlet, or tearing chaff from the wall - all such symptoms are bad and deadly.”

Hippocrates
Under-recognised

- Compared nurse recognition of delirium with interviewer ratings (N=797)
- Nurses recognised delirium in 31% of patients (Not unique to nurses)

- Risk factors for under-recognition:
  - hypoactive delirium, ↑age, vision impairment, dementia

- Therefore it is necessary to screen for delirium

Inouye SK, Arch Intern Med. 2001;161:2467-2473
Screening for delirium
Everyone or those ‘at risk’?

• NICE guidance
  • Over 65
  • Cognitive impairment
  • Hip fracture
  • Severe illness
• BGS best practice
  • Document presence or absence of delirium in all admissions of older people
• Which screening tool?
CAM - Confusion Assessment Method

**Feature 1:** Acute onset of mental status change or a fluctuating course

And

**Feature 2:** Inattention

And

**Feature 3:** Disorganised Thinking

OR

**Feature 4:** Altered Level of Consciousness
[1] ALERTNESS
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
“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.
Achieves 7 months or more correctly 0
Scores < 7 months / refuses to start 1
Untestable 2

[4] ACUTE CHANGE OR FLUCTUATING COURSE
Evidence of significant change or fluctuation in: alertness, cognition, other mental function
(e.g., paranoia, hallucinations) arising over the last 2 weeks and still evident in last 24hrs
No 0
Yes 4

Total:  0 = Probably normal,  1-3 = Probable cognitive impairment,  4 or more = Probable delirium
Prevention of delirium and falls
Evidence for prevention

• HELP  
  Hospital Elder Life Programme

• ReViVE  
  Recruitment of Volunteers to Improve Vitality in the Elderly

• 6-PACK

• FallSafe
HELP

- USA Multi-disciplinary, multi-factorial targeted and structured approach to prevention and treatment of delirium
- Utilising enhanced staff training and trained volunteers

- Targeted 6 risk factors for delirium (and falls)
  - Cognitive impairment
  - Sleep deprivation
  - Immobility
  - Visual impairment
  - Hearing impairment
  - Dehydration

Inouye SK, NEJM (1999)
HELP

Cognitive impairment

Assessment
• AMTS - daily
• <20/30 or <8/10 on orientation = at risk group

Intervention
• Orientation boards - staff and schedule
• Therapeutic activity - daily (all), 3x per day (at risk)
  • Discussion, reminiscence, word games

Inouye SK, NEJM (1999)
HELP

Sleep deprivation

Assessment
• All patients assessed for poor sleep daily

Intervention
• Non-pharmacological sleep promotion
  • Warm drink, relaxation tapes, back massage
• Sleep-enhancement protocol
  • Noise reduction, rescheduling (e.g. drug rounds)
• Night sedation reduced from 46% to 35%

Inouye SK, NEJM (1999)
HELP

Immobility

Assessment
• All patients

Intervention
• Early mobilisation protocol - 3 x daily
  • Mobilisation
  • Range of movement exercise, if bedbound
• Minimise restriction (restraints, catheters)

Inouye SK, NEJM (1999)
HELP

Visual impairment

Assessment
• All patients assessed for visual acuity on admission

Intervention - reinforced daily
• Visual adaptations
  • Large print, lighting, fluorescent tape on call bell
• Visual aids
  • Spectacles, magnifiers

Inouye SK, NEJM (1999)
HELP

Hearing impairment

Assessment
• All patients assessed using whisper test on admission

Intervention
• Hearing aids and amplifiers
• Wax removal when needed

Inouye SK, NEJM (1999)
Dehydration

Assessment
• Patients with high urea:creatinine ration = at risk group

Intervention
• Early recognition of volume depletion
• Encouragement to drink

Inouye SK, NEJM (1999)
HELP - outcomes

- Delirium incidence reduced from 15% to 10%
- Use of night sedation reduced from 45% to 36%
- Cost neutral (using a lot of volunteers)

Inouye SK, NEJM(1999)

- Falls reduced in most sites
  - e.g. 11.4 to 3.8 falls per 1000 patient-days
  - 4.7 to 1.2 falls per 1000 patient-days

Inouye SK, NEJM(2009)
ReViVE

- Service Improvement / Small controlled before-after trial
- Prince of Wales Hospital, Sydney
- HELP translated to a non-US health system

- Same protocols including use of trained volunteers
- Delirium reduced by 36%
- LOS reduced by 4 days (27 to 23)
- **Fall rates reduced by 13%**

6-Pack

FALLS PREVENTION
The Northern Hospital Modified STRATIFY (TNH-STRATIFY)

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fall: current admission? Yes, Patient had a fall’s during current admission</td>
<td>3</td>
</tr>
<tr>
<td>2. Fall: within 12-months? Yes, Patient had fall/s in the last 12-months (Check pt info on admission form)</td>
<td>1</td>
</tr>
<tr>
<td>3. Mental State? Yes, Patient is either confused, agitated, intellectually challenged or impulsive</td>
<td>1</td>
</tr>
<tr>
<td>4. Mobility? Yes, Patient needs supervision or assistance when mobilising</td>
<td>1</td>
</tr>
<tr>
<td>5. Impaired Balance? Yes, Patient has impaired balance and/or hemiplegia</td>
<td>1</td>
</tr>
<tr>
<td>6. Age? Yes, Patient is 80 years or older</td>
<td>1</td>
</tr>
<tr>
<td>7. Toileting? Yes, Patient is in need of frequent toileting</td>
<td>1</td>
</tr>
<tr>
<td>8. Vision? Yes, Patient is visually impaired to the extent that everyday function is affected</td>
<td>1</td>
</tr>
<tr>
<td>9. Drug / Alcohol? Yes, Patient presented with drug / alcohol related problems</td>
<td>1</td>
</tr>
</tbody>
</table>

Risk Score / Level: 3 or more = High Risk

PREVENTION STRATEGIES: Please focus on strategies outlined in “Falls” box inside this Care Plan

FALLS
Complete Riskman for each inpatient Fall
Date completed: 1) __________ 2) __________ 3) __________
(Refer to Risk Assessment tool on front page)

Risk Score__ = low / high Risk
☐ “Alert” sign above bed
☐ Hi-Low bed
☐ Bathroom: Must supervise pt
☐ Bed / Chair Alarm
☐ Walking aid near patient
☐ Adhere to toileting regime
☐ Fall in hosp? → Riskman

☐ As previous shift
☐ Altered, as stated below
☐ As previous shift
☐ Altered, as stated below
FallSafe

- UK Quality improvement project
- Care bundle developed & introduced at ward level, including:
  - Recording fall history on admission
  - Avoidance of new night sedation
  - Call bell, hearing aids, glasses, etc in reach
  - Mobility aids, footwear and walking status
  - Screening for dementia (AMTS) and delirium (CAM)
  - Urinalysis (as a prompt for toileting, continence, infection)
  - Medication review
- Fall rates reduced by 25%
- Night sedation reduced from 34% To 10%

Healey et al, Age and Ageing (2013)
Management of delirium

- Significant overlap with prevention
- Identify the delirium
- Address modifiable factors (as HELP)
- Identify possible acute triggers
- Reassure, reorientate, support, protect
- Minimise restraint
  - Physical - Drips and tubes
  - Chemical - Sedation
Identify triggers

• Clinical assessment
  • Often not easy, may need several attempts
  • Looking for signs of acute illness or injury
  • What has changed?

• Investigation
  • ‘Routine’ blood screen
  • Arterial blood gas – for hypoxia and acidosis
  • Consider imaging – but scans rarely useful

• CAUTION - tests might worsen delirium
Reassurance, not restraint

- De-escalation
- Re-orientation
- **TA DA**
  - Tolerate
  - Anticipate
  - Don’t Agitate

Summary

• Systematically identify those delirious or at risk
  • Screen using CAM or 4AT
  • Assess for vulnerability factors
• Minimise potential insults
  • Medication
  • Interventions and investigations
  • Ward moves, boarding
• Maximise ‘normality’
  • Orientation, lighting and signage
  • Mobilisation, hearing aids, glasses
  • Bowels and bladder, nutrition and fluids
  • Pain relief, sleep promotion, sedative reduction
Conclusion

• Delirium is serious, common and challenging, but under-diagnosed
• Prevention of delirium and prevention of falls require the systematic identification and management of shared risk factors
• Management of delirium involves maximising the normal, minimising the abnormal
• We have a long way to go
Thank you