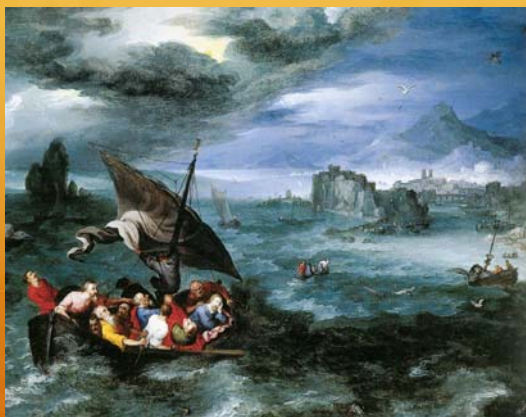


All at Sea: Dementia, Delirium and Hospitals



Dr Sean Maher
Department of Rehabilitation
and Aged Care





They came in the night...

- ⊗ 95 YO Ukranian woman
- ⊗ Lives at home with CACP for support
- ⊗ Presented with chest pain, nausea, vomiting
- ⊗ Shingles apparent and had taken opiates 3 days before for pain. BNO 5 days.
- ⊗ Ix Bloods NAD, AXR faecal loading +++
- ⊗ Rx valacyclovir, hydrated, enema

They came in the night...

- ✿ Pain settled with paracetamol only.
- ✿ Spent 2 days recovering.
- ✿ Planned discharge
- ✿ Moved from AAU at 4am to make room
- ✿ Acutely distressed, paranoid, resistive
- ✿ Sedated with resperidone
- ✿ Prolonged hospital stay another 3 days

Delirium: Definition

- ✿ de lira “to wander”
- ✿ Clinical syndrome characterised by

rapid onset of
Inattention,
altered consciousness and cognition,
that fluctuates

Delirium: Epidemiology

✿ *Prevalence* in elderly hospital admissions

✿ 10 - 24%

✿ *Prevalence* in Nursing Home residents

✿ 15% (1 - 40 %)

✿ *Incidence* during hospital stay

✿ 6 - 56%

✿ *Post operative incidence*

✿ 10 - 61%

Delirium: Aetiology

- ✿ Geriatric syndrome
- ✿ Multiple factors acting in concert
- ✿ Patient vulnerability
- ✿ Predisposing factors ("risk ")
- ✿ Precipitating factors ("causes")

Delirium: Risk factors

- ⚙️ Dementia
- ⚙️ Multiple medications
- ⚙️ Visual and hearing impairment
- ⚙️ Dehydration
- ⚙️ Malnutrition
- ⚙️ Sleep Deprivation
- ⚙️ Functional disability
- ⚙️ Advanced age
- ⚙️ Severe/multiple chronic medical conditions
- ⚙️ Neurological damage
- ⚙️ Alcohol abuse
- ⚙️ Depression
- ⚙️ Frailty

Delirium: Precipitating factors / Causes

- ⚙️ Severe acute illness
- ⚙️ Medications
- ⚙️ Addition of >3 new medications
- ⚙️ Infection
- ⚙️ Electrolyte and acid base disturbance
- ⚙️ Hypoxia or hypercapnia
- ⚙️ Hepatic or renal failure
- ⚙️ Hypoglycaemia
- ⚙️ Stroke
- ⚙️ Environmental change
- ⚙️ Restraint use
- ⚙️ Immobilisation
- ⚙️ Indwelling catheter
- ⚙️ Alcohol withdrawal
- ⚙️ Benzodiazepine withdrawal

Medications and delirium

- ✿ Contribute to 40% of episodes
- ✿ Diminished hepatic and renal reserve
- ✿ Drug - drug and drug - disease interactions
- ✿ Psychoactive
- ✿ Drugs crossing the blood brain barrier
- ✿ Total anticholinergic burden

Medications causing delirium

- ✿ Benzodiazepines
- ✿ Antiparkinsonian
- ✿ Antidepressants
- ✿ Opiates
- ✿ Anticonvulsants
- ✿ Lithium
- ✿ Antiarrhythmics (quinidine)
- ✿ Digoxin
- ✿ Antihypertensives (β -blockers)
- ✿ H₂ receptor blockers
- ✿ Corticosteroids
- ✿ NSAIDs
- ✿ Over the counter and herbal
- ✿ Antihistamines
- ✿ Neuroleptics

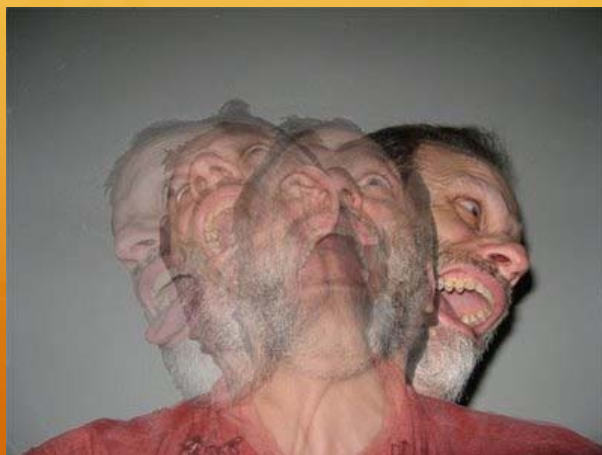
Delirium: Pathophysiology

- ✿ Result of multiple pathogenic mechanisms
- ✿ Impaired cerebral oxidative metabolism
- ✿ Impaired neurotransmitter function
- ✿ Affects numerous brain regions
- ✿ Cholinergic transmission mostly affected
 - ✿ Regulate sleep, attention and memory
- ✿ Other pathways involved including serotonergic GABAergic and dopaminergic

Delirium: Pathophysiology

- ✿ Steroids can induce delirium
- ✿ HPA axis abnormalities in delirium and dementia
- ✿ Cytokines
 - ✿ Higher IL 6 and IL 8
 - ✿ Reduced neuroprotective factors IGF-1, IL – 1RA
- ✿ ?Different pathophysiology for different people
- ✿ ?Final common pathway

How can you tell if someone has Delirium?



Does she have Delirium?

<http://geri-em.com/cognitive-impairment/screening-for-delirium/>

Delirium: Detection

- ❁ Delirium is often missed!
- ❁ 32 – 67% of delirious patients are not diagnosed
- ❁ Cognitive assessment should be standard
 - ❁ MMSE or AMTS or RUDAS
- ❁ Mental status = a “vital sign”
 - ❁ (WA Health Dept *Delirium Model of Care*)
- ❁ Serial testing to screen for cognitive change arising during an admission
 - ❁ *Loss of 2 points on AMTS is highly predictive of delirium*

Delirium: Detection

- ❖ 4AT (MacLulich et al)
 - ❖ Alertness
 - ❖ AMT4 – DOB, Place, Age, current year
 - ❖ Attention – months of year backwards
 - ❖ Acute change or fluctuating course
 - ❖ <http://www.the4at.com>

Delirium: Clinical Features

- ⊗ A - **Acute Onset** – hours to days
- ⊗ F – **Fluctuation** – lucid during day, night disturbance
- ⊗ R – **Rambling** - thinking and speech is disordered
- ⊗ A - **Alertness / consciousness** altered
- ⊗ I - **Inattention**
- ⊗ D – **Disorientation**

- ⊗ A - **Agitation / apathy**
- ⊗ S - **Sleep wake cycle** disturbance
- ⊗ (H) – **Hallucinations** – perceptual disturbance

Delirium: Diagnosis

⊗ Confusion Assessment Method (CAM)

⊗ (Inouye et al Ann Int Med 1990;113:234-42)

1 Acute onset and fluctuation of cognition

AND

2 Inattention

with EITHER

3 Disorganised thinking

OR

4 Altered level of consciousness

Investigations



Delirium: Investigation

- ✿ Routine
- ✿ FBP
- ✿ U&E
- ✿ Glucose
- ✿ Calcium
- ✿ Liver function tests
- ✿ Cardiac enzymes
- ✿ Urinalysis and MSU
- ✿ O₂ saturation
- ✿ CXR
- ✿ Consider
- ✿ ECG
- ✿ TFT
- ✿ Arterial blood gases
- ✿ B12 and folate
- ✿ CT brain
- ✿ EEG

Delirium: Management



Delirium: Management

- ⚙️ Treat underlying causes
- ⚙️ Correct dehydration
- ⚙️ Review medications
- ⚙️ Non Pharmacological
- ⚙️ Pharmacological
- ⚙️ Monitor progress
- ⚙️ Prevent complications esp Falls

Delirium: Non Pharmacological Mx

- ❁ Correct sensory deficits using glasses and hearing aids
- ❁ Good quality communication, simple instructions, avoid jargon and re orient
- ❁ Re orientation by providing calendars, clocks, schedules
- ❁ A quiet environment with low level light to reduce misperceptions
- ❁ Minimise room and staff changes
- ❁ A view to the outside

Delirium: Non Pharmacological Mx

- ❁ Treat malnutrition
- ❁ Adjust therapies to avoid sleep disruption
- ❁ Minimise immobilising devices
- ❁ Encourage mobility and self care
- ❁ Avoid restraints and bed rails
- ❁ Involve family where possible
- ❁ Meaningful personal items

Delirium: Pharmacological Mx

- ✿ Withdrawal of medications
- ✿ Delirium doesn't always require sedation
- ✿ Distress warrants medication
- ✿ Little evidence to guide treatment choice in delirium in elderly patients
- ✿ Emerging evidence of harm from antipsychotics in dementia

Delirium: Pharmacological Neurolept agents

- ✿ **Risperidone 0.25 – 0.5mg bd**
- ✿ **Haloperidol** appropriate short term
- ✿ ***Avoid** in extrapyramidal syndromes such as Parkinson's disease and Lewy body Dementia*
- ✿ **Haloperidol** e.g. 0.25 – 1.0mg bd PO
- ✿ Parenteral if very agitated e.g. 0.5-2.5mg IM
- ✿ Elderly patients commonly receive relatively large doses e.g. 5mg with inadequate time between doses!

Delirium: Pharmacological Benzodiazepines

- ✿ Appropriate in alcohol or drug withdrawal
- ✿ May be appropriate where anxiety is predominant
- ✿ May worsen confusion and sedation
- ✿ Agents with short half life and no active metabolites are preferable
 - ✿ e.g. lorazepam 0.5mg or oxazepam 15mg daily

Delirium is Bad (x 3)

- | | |
|--|--|
| ✿ Length of Stay at least doubles | ✿ Complications increase 3 - fold |
| ✿ Cognitive decline worsens | ✿ Falls, Incontinence, Pressure sores |
| ✿ Risk of dementia increased 3 times | ✿ Hip Fracture complications treble |
| ✿ PWD decline at 3 times rate after delirium | ✿ poor functional outcome, decline in ambulation, death or admission to nursing home |
| | ✿ Residential care 3 times more likely |

Eeles et al Hospital use, institutionalisation and mortality associated with delirium. *Age Ageing* 2010;39:470-5
 Rockwood et al The risk of dementia and death after delirium. *Age Ageing* 1999;28:551-6.
 Fong et al. Delirium accelerates cognitive decline in Alzheimer disease. *Neurology* 2009;72:1570-5.

O'Keeffe et al. The prognostic significance of delirium in older hospital patients. *J Am Geriatr Soc* 1997;45:174-8
 Marcantonio et al. Delirium is independently associated with poor functional recovery after hip fracture. *J Am Geriatr Soc* 2000;48:618-24

Delirium increases Mortality

- ⊗ Delirium in hospital is associated with mortality rates of 25 – 33%!!
- ⊗ Most studies report higher mortality after discharge eg 39% vs 23% at two years
- ⊗ Hazard ratio of 2.11 at 1 year adjusted for comorbidity, dementia and severity of illness
- ⊗ Median time to death 162 days with delirium vs 1,444 days without. Adjusting for multiple confounders, delirium was associated with an increased risk of death (hazard ratio range 2.0–3.5)

Francis J Prognosis after hospital discharge of older medical patients with delirium. J Am Geriatr Soc 1992;40(6):601-6
 McCusker et al Delirium predicts 12 month mortality. Arch Intern Med. 2002;162:457-463
 Eeles E et al. Hospital use, institutionalisation and mortality associated with delirium. Age and Ageing 2010; 39: 470–475

Delirium is Expensive

- ⊗ Estimated Total cost to US health care system in 2005 health dollars
- ⊗ Delirium \$143 – 152 BN!!!
- ⊗ Hip Fracture \$7 BN
- ⊗ Falls \$19 BN
- ⊗ Diabetes \$91.8 BN
- ⊗ CVD \$257 BN

Leslie DL, Inouye SK. The importance of delirium: economic and societal costs. J Am Geriatr Soc 2011;59 Suppl 2:S241-3



“Thousands of tiny little creatures,” he said, “some on horseback, waving arms, carrying weapons like some grand Renaissance battle,” were trying to turn people “into zombies.” Their leader was a woman “with no mouth but a very precisely cut hole in her throat.”

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WHAT'S CHIC RIGHT NOW
ALL THAT GLITTERS

Hallucinations in Hospital Pose Risk to Elderly

By PAM BELLUCK
Published: June 20, 2010

No one who knows Justin Kaplan would ever have expected this. A Pulitzer Prize-winning historian with a razor intellect, Mr. Kaplan, 84, became profoundly delirious while hospitalized for pneumonia last year. For hours in the hospital, he said, he imagined despotic aliens, and he struck a nurse and threatened to kill his wife and daughter.

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“Thousands of tiny little creatures,” he said, “some on horseback, waving arms, carrying weapons like some grand Renaissance battle,” were trying to turn people “into zombies.” Their leader was a woman “with no mouth but a very precisely cut hole in her throat.”

Attacking the group’s “television production studio,” Mr. Kaplan fell from his hospital bed, cutting himself and “sliding across the floor on my own blood,” he said. The hospital called security because “a nurse was trying to restrain me and I repaid her with a kick.”

Well

Delirium: A Measure of Quality of Care?

- ❁ Failure to detect
- ❁ Iatrogenesis
- ❁ Inappropriate environment
- ❁ Lack of skilled staff
- ❁ Costs to health system

Prevention



Delirium: Prevention

- ✿ Prospective study involving 852 older general medical patients with 426 matched pairs
- ✿ Compared usual care vs interventions to manage risk factors
 - ⊗ visual and hearing impairment
 - ⊗ dehydration
 - ⊗ previous cognitive impairment
 - ⊗ sleep deprivation
 - ⊗ immobilisation
 - ⊗ psychoactive medication use

✿ Inouye et al N Engl Med 1999;340:669-76

Delirium: Prevention

- ✿ Incidence of delirium lower in intervention vs usual care group (9.9% vs 15%)
 - ✿ Total days of delirium (105 vs 160)
 - ✿ Number of episodes of delirium (62 vs 90)
 - ✿ No difference in severity of delirium or recurrence rates
 - ✿ Major effect of interventions was to prevent the primary episode of delirium
- ✿ Inouye et al N Engl Med 1999;340:669-76

Hospital Elder Life Program (HELP)

- ✿ Multicomponent intervention targeting risk factors
- ✿ Uses geriatrician expertise, nursing and AH staff and trained volunteers
- ✿ Aims to prevent cognitive and functional decline
- ✿ Volunteers provide support, encouragement, activities to enhance cognition, address sleep deprivation, sensory deficits and dehydration

✿ Inouye SK, Bogardus ST, et al. The Hospital Elder Life Program: a model of care to prevent cognitive and functional decline in older hospitalized patients. Hospital Elder Life Program. J Am Geriatr Soc 2000;48:1697-706

Recruitment of Volunteers to Improve Vitality in the Elderly (ReViVe)

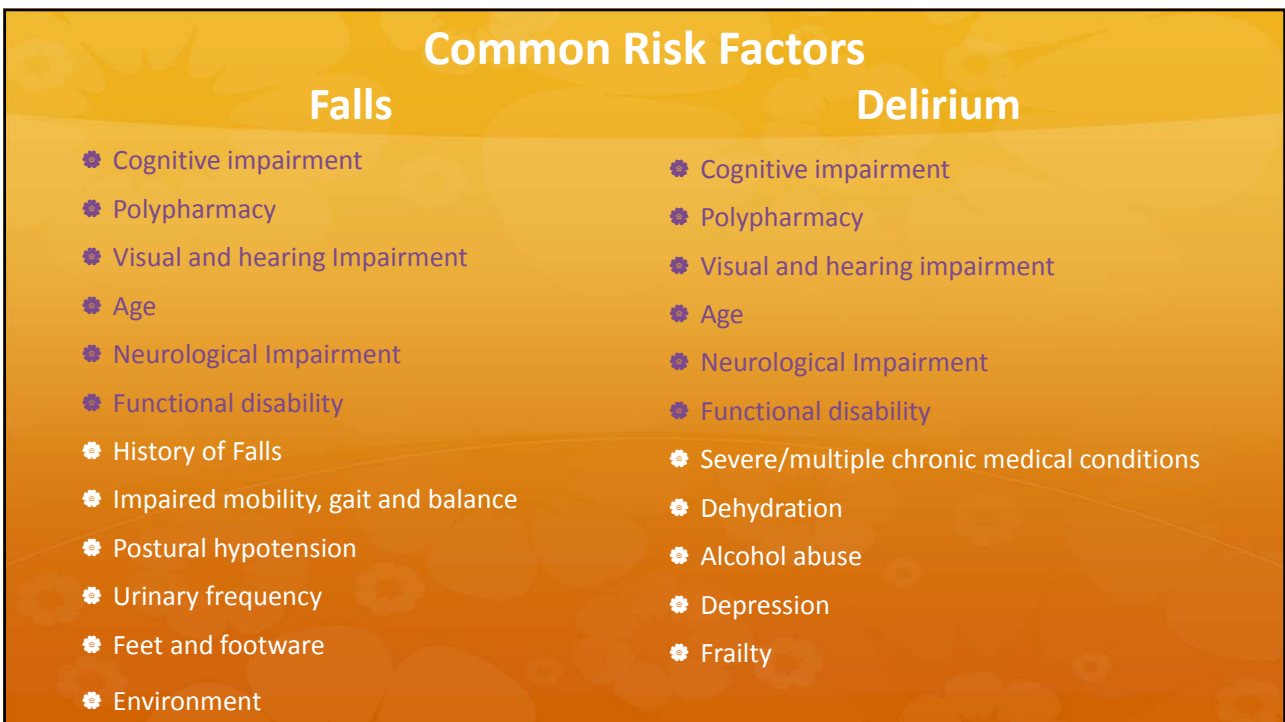
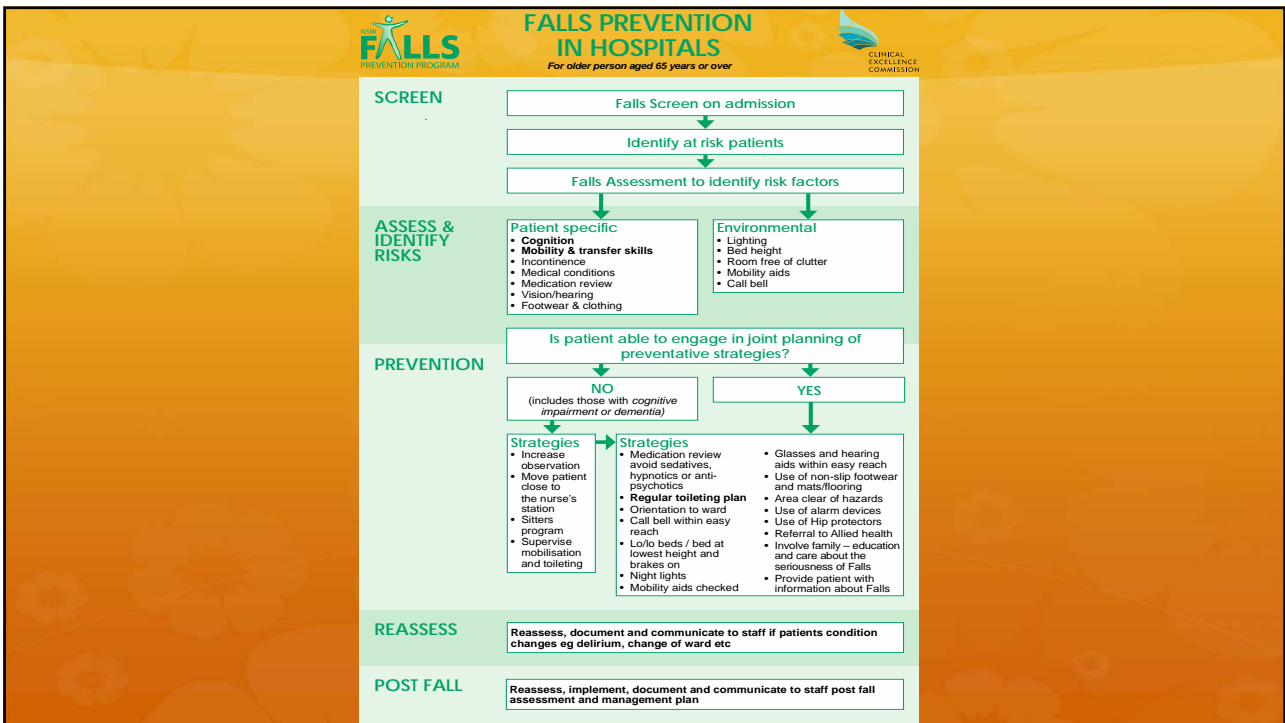
- ✿ Trained volunteers visit daily and reorient patients to “here and now” via writing and talking
- ✿ Cognitive stimulation via newspaper reading, board games, trivia, discussion, reminiscence
- ✿ Assist with glasses hearing aids, mobility, meals and hydration
- ✿ Reduced incidence, severity and duration of delirium, reduced costs

⊗ Caplan GA, Harper EL. Recruitment of volunteers to improve vitality in the elderly: the REVIVE study. Intern Med J 2007;37:95-100.

Education Programmes

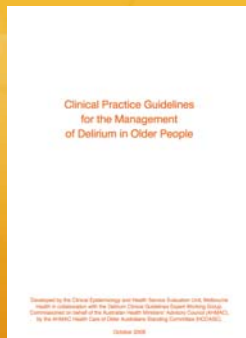
- ✿ Several publications showing education programmes reduce delirium rates
- ✿ Generally needs to involve small groups and interactive sessions
- ✿ Programmes need delivery to all staff and to be maintained

⊗ Tabet N, Hudson S, Sweeney V, et al. An educational intervention can prevent delirium on acute medical wards. Age Ageing 2005;34:152-6



Comprehensive Geriatric Assessment

- ❁ Best model for Hospital Patients unclear....
- ❁ In Emergency Department?
- ❁ Separate ED for older people?
- ❁ Medical Assessment units?
- ❁ Direct admission to Acute Care of Elderly Units?



What Can you Do?

- ⚙ Screen for common risk factors
- ⚙ Baseline cognitive assessment
- ⚙ Ensure good quality foundation of care
- ⚙ Detect change in cognition
- ⚙ Consider causes
- ⚙ Investigations
- ⚙ Non pharmacological approach
- ⚙ Pharmacological measures lowest dose, shortest time
- ⚙ Prevent complications
- ⚙ Monitor
- ⚙ Reassess function and cognition
- ⚙ Consider rehab and cognitive assessment

Delirium: Take Home Messages

- ⚙ Complex Geriatric Syndrome
- ⚙ Common and Distressing
- ⚙ Often Missed
- ⚙ Predicts adverse outcomes
- ⚙ Cognitive testing should be routine
- ⚙ Preventable with multicomponent interventions and education programmes
- ⚙ Synergies likely with Comprehensive Geriatric Assessment

