Delirium Toolbox – Inpatient/Outpatient high value care considerations

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Goals for this session

- Understand prevalence, differential diagnosis, evaluation, risk factors for delirium with emphasis on evidence based, high value care
- Delirium assessment toolkit
- Prevention and management strategies for delirium
- Delirium prevention toolkit
- Aging sensitivity exercise
Hallucinations and delusions in delirium
Background

acute confusional state, acute mental status change, organic brain syndrome, reversible dementia, toxic or metabolic encephalopathy

Delirium is known by many names.

- The term “delirium,” literally means “a going off the ploughed track, a madness.”
Diagnostic Criteria

- Disturbed consciousness is central.
- Cognitive change or perceptual disturbance
- Three subtypes (hyperactive, hypoactive, and mixed).
- Rapid onset (hours to days) and fluctuating daily course
- Evidence of a causal physical condition.

Delirium is acute brain failure.

DSM-5 2013: 596-602
A 78 year old man hospitalized with pneumonia is sleepy, does not participate with therapy, and does not eat his meals. He has lived alone for many years. This presentation is most consistent with:

A. Depression
B. Systemic effects of pneumonia
C. Hypoactive Delirium
D. Medication side effects
Delirium takes various forms

• Hyperactive or agitated delirium
  • 25% of all cases

• Hypoactive delirium
  • less recognized or appropriately treated

• Mixed
Predisposing factors

- Advanced age
- Dementia
- Functional impairment in ADLs
- Medical comorbidity
- History of alcohol abuse
- Male sex
- Sensory impairment (↓vision, ↓hearing)
- Depression
- Cardiovascular disease
Precipitating factors

- Drugs
- Electrolyte abnormalities
- Lack of drugs (pain / withdrawal)
- Infection
- Reduced sensory input
- Intracranial (Rare)
- Urinary retention / fecal impaction
- Myocardial
- Surgery
Prevalence and Cost

Prevalence:
- 10-30% of all hospitalized medically ill patients
- 10-40% of all hospitalized elderly patients
- 25% of all hospitalized cancer patients
- 30-40% of all hospitalized AIDS patients
- 80% of terminally ill patients
- Common Problem among older patients

Cost of Delirium:
Avg. cost per day for patients with delirium 2.5 times those who do not develop delirium
Total cost estimates attributable to delirium $16K - $64K

(Leslie, et al. 2008, Arch Int Med)
Bad consequences with delirium

- 3x risk of Functional Decline
- A 3- to 5-fold ↑ risk of nosocomial complications, prolonged stay, post-acute/nursing-home placement
- A 10-fold risk of death in hospital
  - Risk of Death Equivalent to Acute MI
- Poor functional recovery and ↑ risk of death up to 2 years following discharge
- Persistence of delirium → poor long-term outcomes
Dementia Assessment Toolbox
Evaluation: history

• Focus on time course of cognitive changes, esp. their association with other symptoms or events
• Medication review, including OTC drugs, alcohol

• Find reliable informant to describe the patient’s:
  • Daily functional status such as ADLs (e.g., ability to tend to hygiene, etc.)
  • More complex functioning such as IADLs (e.g., shopping, cooking, finances, etc.)
  • Typical activity/level of independence prior to medical illness
Physical examination

• Vital signs
• Oxygen saturation
• General medical evaluation
• Neurologic and mental status examination
Medications that contribute

- Alcohol
- Anticholinergics
- Anticonvulsants
- Antidepressants
- Antihistamines
- Anti-inflammatory Agents
- Anti-parkinsonian Agents
- Antipsychotics
- Barbiturates
- Benzodiazepines
- H2 Antagonists
- Opioid Analgesics
### Laboratory evaluation

- **Based on History and Physical:**

<table>
<thead>
<tr>
<th>Test</th>
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<tbody>
<tr>
<td>Complete Blood Count</td>
<td>Complete Metabolic Panel</td>
<td>Serum Calcium</td>
</tr>
<tr>
<td>Thyroid Function Test</td>
<td>Urinalysis</td>
<td>Blood Cultures</td>
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<tr>
<td>Serum Drug Levels</td>
<td>Arterial Blood Gases</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Chest X-Ray</td>
<td>Electrocardiogram</td>
<td>Blood Alcohol Levels</td>
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- Cerebral Imaging, electroencephalogram and cerebrospinal fluid analysis are rarely helpful
## Differential Diagnosis of Delirium

<table>
<thead>
<tr>
<th></th>
<th>Delirium</th>
<th>Depression</th>
<th>Dementia</th>
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</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>Acute</td>
<td>Sub-acute /Chronic</td>
<td>Chronic</td>
</tr>
<tr>
<td><strong>Cognitive Domain(s)</strong></td>
<td>Attention</td>
<td>Severe depression can cause deficits in cognitive function</td>
<td>Memory</td>
</tr>
<tr>
<td><strong>Reversible</strong></td>
<td>Potentially</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td><strong>Future Vulnerabilities</strong></td>
<td>Long term care, decreased functional ability, prolonged cognitive sequelae, &amp; death</td>
<td>Decreased functional ability</td>
<td>Long term care, decreased functional ability, &amp; death</td>
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Severe depression can cause deficits in cognitive function.
88 year old patient with hip fracture after a fall at home develops agitation, confusion, sleep-wake cycle disruption, and hallucinations on the 2\textsuperscript{nd} day of hospitalization awaiting surgery. The best assessment tool to diagnose his condition is:

A. MMSE (Mini Mental Status Examination)
B. CAM (Confusion Assessment Method)
C. GDS (Geriatric Depression Scale)
D. Clock draw
Who to screen and how?

- Screen all hospitalized patients at risk
  - especially all hospitalized patients aged 70 years and older (level B evidence)
- Use standardized mental status assessment test
  - CAM – Confusion Assessment Method
  - CAM-ICU if patient is nonverbal
  - Attention test: e.g. recite serial 7s, spell W-O-R-L-D backwards, do the months of the year backwards.
  - Clock draw
CONFUSION ASSESSMENT METHOD

- Requires features 1 and 2 and either 3 or 4:
  1. Acute change in mental status and fluctuating course
  2. Inattention
  3. Disorganized thinking
  4. Altered level of consciousness
Delirium is a Preventable Syndrome

- Up to 50% of delirium cases preventable
- Often an unrecognized problem
- Commonly associated with poor outcomes
- NICE* guidelines consider delirium prevention to be cost effective

*Nat’l Institute for Health and Care Excellence, July 2010
Inouye, SK. NEJM 1999;340:649
Interventions to Prevent Delirium Based on Clinical Factors

- Cognitive impairment
- Dehydration
- Constipation
- Urinary retention
- Hypoxia
- Immobility
- Infection
- Polypharmacy
- Pain
- Poor nutrition
- Sensory impairment

Next Steps

- Staff education key in prevention
- Ideally multidisciplinary team provides multicomponent interventions
- Those at risk should be assessed for delirium prevention within 24 hours of admission
Hospital Elder Life Program (HELP)

- An approach to helping prevent delirium with goals:
  - Maximizing physical and cognitive functions throughout hospital stay
  - Maximizing independence at discharge by assisting with transitions of care

Inouye, SK. etal. JAGS 2006;54:1492.
Hospital Elder Life Program (HELP)

- Utilized skilled staff (nurse coordinator) and trained volunteers to carry out interventions
- Decreased incidence of delirium in 40% of cases (decrease in cost of care)
- Resulting in fewer days and episodes of delirium

Inouye, SK. Et al. NEJM 1999; 340:669.
Inouye, SK. Et al. JAGS 2006;54:1492.
Audience Response

Which of the following is NOT a risk factor for future delirium:

A. Cognitive impairment
B. Visual/Hearing impairment
C. Psychoactive Medication use
D. ApoE4 Allele positivity
E. Sleep deprivation
Hospital Elder Life Program (HELP)

- Interventions were based on 6 risk factors for incident delirium:
  - Cognitive impairment
  - Visual/hearing impairment
  - Immobilization
  - Antipsychotic medication use
  - Sleep deprivation
  - Dehydration

Inouye, SK. et al. JAGS 2006;54:1492.
A 90 year old female with dehydration presents from an assisted living facility. Which of the following would NOT be a useful tool to help prevent delirium?

A. Early mobilization and therapy
B. Have hearing aids and glasses in her room
C. Use frequent orientation cues and visible calendar
D. Access to fluids at bedside
Delirium Prevention Toolbox
(Practical Interventions Directed at Risk Factors)

Sensory Impairment
- Reading glasses
- Magnifiers
- Hearing pocket amplifiers

Cognitive Impairment
- Large print calendars
- Crossword puzzles
- Memory games (Sudoku..)
- Card games
- Modeling clay

- Have glasses/hearing aids at bedside
- Look for cerumen impaction
- Reality orientation
- Day/Night orientation
- Family members in room
Delirium Prevention Toolbox

**Constipation**
- Latex free gloves

**Dehydration**
- Fluids at bedside
- Straws
- Easily grasped containers

**Immobility**
- Assistive devices
- Walkers, rollators, 4 prong canes

- Look for fecal impaction
- Fluids/fiber
- Mobilize frequently
- Early recognition
- Monitor and assist with volume repletion
- Encourage early PT/OT
- Remove restraints
  - Foley catheters
- Early mobilization
**Delirium Prevention Toolbox**

**Sleep**
- Ear plugs
- Sleep masks

- Minimize nighttime disturbances
  - Night light
  - Relaxing music
  - Massage
  - Warm drink
Delirium Management

Non-pharmacologic approaches

- Implement first
- Focus on patient and family centered care
- Provide early (pre-op) geriatrics consultation for elderly

Marcantonio, ER. Ann Intern Med 2011;154(11):ITCG-1
Delirium Management
Pharmacologic Approaches

Pharmacologic approaches
- Haloperidol (Antipsychotic)
  - 0.25 mg-1mg PO, IM, IV
  - q 4 hrs. prn agitation
  - Agent of choice
  - EPS>3 mg/d

- Olanzapine (Antipsychotic)
  - 2.5mg-5 mg PO, IM
  - q 12 hrs. prn
  - Less EPS
  - More sedating
  - Maybe less effective for acute management
Delirium Management
Pharmacologic Approaches

**Quetiapine**  
(Antipsychotic)  
- 12.5 mg-50mg  
- q 12 hr PO prn  
- Less EPS  
- Can cause orthostatic hypotension

**Risperidone**  
(Antipsychotic)  
- 0.25mg-1mg PO  
- q 4 hr prn  
- Similar to haloperidol
Delirium Management

Lorazepam
(Benzodiazepine)

- 0.25-1mg PO or IV
- q 8 hr prn
- Use with ETOH withdrawal
- More paradoxical excitation
- 2nd line for delirium

AGS, Geriatric Review Syllabus. 2013. New York, NY
Follow Up of Delirium

- Last for days, months, or may never resolve and lead to death
- Evaluate cognitive function periodically even if delirium has resolved
  - Risk factor for dementia
- Delirium is more common to recur after having delirium once.
Summary

- Under recognition is a major problem
  - nurses recognize and document < 50%
  - physicians recognize and document only 20%
- Delirium is common, morbid, and costly.
- Delirium is often confused with dementia or depression.
Key messages for delirium treatment

- Identify causative and contributing factors
- Address, reverse, or try to prevent these factors as much as possible
- Provide supportive care to reduce risk of complications
- Attempt to minimize the duration of delirium
- Use the toolboxes!