Delirium in the Hospitalized Patient

Jean-Pierre Yared, M.D.
Department of Cardiothoracic Anesthesia
Department of Outcomes Research
Director, Center for Critical Care Medicine in HVI
Patients Perspective

• What do patients say when they talk about their experience with delirium?
Patients Perspective

- It’s real
- Patient often remembers it in detail
- Patient is often embarrassed or scared by the content of the hallucinations
Objectives:

• Understand and recognize delirium in the hospital setting, both ICU and floor
• Review the impact of delirium on patient outcomes
• Describe screening tools for early detection of delirium
• Discuss delirium prevention and management care paths
Question 1

The incidence of delirium in hospitalized patients is as high as

a) 15%
b) 22%
c) 33%
d) 56%
e) 90%
The incidence of delirium in hospitalized patients is as high as

a) 15%
b) 22%
c) 33%
d) 56%
e) 90%
Delirium is a Disturbance of consciousness with

- Inattention
- Change in cognition
- Perceptual disturbance
- Develops over a short period of time (hours to days)
- Fluctuates over time
- Caused by medical condition, substance intoxication, or medication.
Characteristics of Delirium

- Hyperactive, hypoactive, or mixed
- Hallucinations are not required
- may take weeks or even months to resolve
  • subacute or persistent delirium.
- Brain Failure
Delirium Symptoms

- Sleep-wake cycle disturbances
- Alterations in motor activity level
- Thought process abnormalities
- Disrupted environmental interactions
- Lability of affect
- Thought content abnormalities
- Language disturbances
Why worry about delirium?

Common

Complications

Life threatening

Increased morbidity/mortality

Potentially preventable

Often underecognized
Prevalence in Hospital

• 10-30% of all hospitalized medically ill patients
• 51% postoperative patients
• 56% incidence in geriatric patients
Prevalence in ICU

- Incidence 20 – 50% in lower acuity patients
- 60-80% in patients on mechanical ventilation
- Older patients are most vulnerable
Why monitor for delirium?

- Threefold-higher reintubation rate
- > 10 additional days in the hospital
- Higher ICU and in-hospital mortality (2-3x)
- > threefold-increased risk of 6-month mortality
- Cumulative risk: each day with delirium
  - increases hospitalization by 20%
  - Increases death by 10%
- Higher ICU costs and hospital costs
Why monitor for delirium?

- 32%: persistent delirium related to long-term cognitive impairment
- “delirium on dementia” and “dementia following delirium”: a dementia-like entity
- ~1/3 of ICU patients on mechanical ventilation have long term cognitive impairment 6 months after discharge
Long Term Outcome

• **Post-ICU long-term cognitive impairment**
  - Memory
  - Attention
  - Executive function

• **Delirium and declining function**
  - Inability to return to work
  - Impaired activity of daily living
  - Increased risk of institutionalization
  - Decreased quality of life
### Clinical Presentation

<table>
<thead>
<tr>
<th>Hyperactive (10-30%)</th>
<th>Hypoactive (20-40%)</th>
<th>Mixed (50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased psychomotor activity</td>
<td></td>
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<tr>
<td>• Rapid speech</td>
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<tr>
<td>• Irritability</td>
<td></td>
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<tr>
<td>• Restlessness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Paranoia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lethargy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Slowed speech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Decreased alertness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Apathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Often unrecognized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Higher mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change between hyperactive and hypoactive states within the shift</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Variable, unpredictable course & may persist for several weeks after discharge**
Question 2

All of the following are risk factors for delirium EXCEPT:

a) Beta blocker therapy
b) Parkinson disease
c) Impaired vision
d) Functional impairment
e) Male sex
Question 2

All of the following are risk factors for delirium EXCEPT:
a) Beta blocker therapy
b) Parkinson disease
c) Impaired vision
d) Functional impairment
e) Male sex
### Predisposing Factors

<table>
<thead>
<tr>
<th>Cognitive impairment (Dementia, MMSE &lt;27)</th>
<th>Hypothermia or fever</th>
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</thead>
<tbody>
<tr>
<td>Apolipoprotein E4 phenotype</td>
<td>Smoking</td>
</tr>
<tr>
<td>Advanced age (65-70 y/o)</td>
<td>Alcoholism</td>
</tr>
<tr>
<td>CVA, TIA, AFib</td>
<td>Severity of illness scores</td>
</tr>
<tr>
<td>Depression</td>
<td>Sensory impairment, deprivation, or overload</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Preoperative electrolyte disturbance or dehydration</td>
</tr>
<tr>
<td>Liver, kidney, or heart failure</td>
<td>Number or drugs/psychotropics before admission</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>Invasive procedures</td>
</tr>
<tr>
<td>Dehydration, shock, under-nutrition</td>
<td>Residing in assisted living setting</td>
</tr>
<tr>
<td>Hypo/hyperglycemia</td>
<td></td>
</tr>
<tr>
<td>Hypo/hyperthyroidism</td>
<td></td>
</tr>
</tbody>
</table>
## Precipitating Factors

<table>
<thead>
<tr>
<th>Hypoxia</th>
<th>Withdrawal/Toxic</th>
</tr>
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<tbody>
<tr>
<td>Cardiac or pulmonary failure</td>
<td>Immobilization/physical restraints</td>
</tr>
<tr>
<td>Metabolic/endocrine/electrolyte disturbances</td>
<td>Pain</td>
</tr>
<tr>
<td>Acute infection</td>
<td>Number of drugs/psychotropic medications</td>
</tr>
<tr>
<td>Seizures, stroke, head trauma</td>
<td>Sleep deficiency (average sleep in ICU 2 hours in 24 hours)</td>
</tr>
<tr>
<td>Dehydration, hypoperfusion</td>
<td></td>
</tr>
<tr>
<td>Hyperthermia</td>
<td>MEDICATIONS</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Sedatives and analgesics</td>
</tr>
<tr>
<td>Intracranial space-occupying lesions, CNS pathological processes</td>
<td>Anticholinergics</td>
</tr>
<tr>
<td></td>
<td>Lorazepam, midazolam</td>
</tr>
<tr>
<td></td>
<td>Fentanyl, morphine, Propofol</td>
</tr>
</tbody>
</table>
Delirium Balance

- Predisposing, Precipitating and Aggravating factors
- Protective factors
Aggravating Factors

- Environmental
- Deficient patient, family and caregiver education
- Medical
Aggravating Factors

**Medical**

- Infection
- Electrolyte disturbances and dehydration
- Malnutrition and vitamin deficiencies
- Hypoxia and inadequate perfusion of the brain
- Withdrawal
- Manage discomfort or pain
  - Excessive sedation increases delirium risk
  - Inadequate pain control also increase the risk of delirium.
    - Impaired use of PCA
    - Ineffective communication of pain scores
    - Effects of acute pain on CNS dopaminergic and cholinergic pathways
Example of Doing the Right Thing..

Delirium is an important syndrome affecting inpatients in various hospital settings. This article focuses on multidisciplinary and interdepartmental collaboration to advance efforts in delirium clinical care and research. The Johns Hopkins Delirium Consortium, which includes members from the disciplines of nursing, medicine, rehabilitation therapy, psychology, and pharmacy within the departments and divisions of anesthesiology, geriatrics, oncology, orthopedic surgery, psychiatry, critical care medicine, and physical medicine and rehabilitation at the Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center, is one model of such collaboration. This article describes the process involved in developing functional collaboration around delirium and highlights projects, opportunities, and challenges resulting from them. J Am Geriatr Soc 59: S244-S248, 2011.

Key words: delirium care and prevention; inpatient care; interdisciplinary; collaboration

Severely ill patients and those with organ dysfunction, exposure to toxic medications, brain tumors, or stroke. Postoperative patients are also at high risk for delirium after general anesthesia and major surgical interventions.

Given the large number of at-risk patient groups spanning a variety of inpatient settings, a multidisciplinary, interdepartmental approach is essential for successful prevention and treatment of delirium. Crucial to this effort are clinicians from multiple disciplines, including nursing, medicine, psychology, pharmacy, and rehabilitation sciences, along with departments and divisions such as anesthesiology, geriatrics, oncology, orthopedic surgery, psychiatry, pulmonary and critical care medicine (PCCM), and physical medicine and rehabilitation (PM&RR). Although psychiatrists and psychologists are often considered experts in delirium identification, because of its neuropsychiatric involvement and definition in the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders, multidisciplinary, interdepartmental
Clinical and research work related to delirium has expanded and strengthened the relationships between departments. Includes members from the disciplines of nursing, medicine, rehabilitation therapy, psychology, and pharmacy.

Includes the departments and divisions of anesthesiology, geriatrics, oncology, orthopedic surgery, psychiatry, critical care medicine, and physical medicine and rehabilitation.

Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center.
John Hopkins Experience

- Nursing staff implemented delirium screening using a standardized instrument in each shift.
- MICUs adopted the CAM-ICU-2 delirium screening every shift.
- A single instrument could be used throughout the hospital outside ICU.
- Weekly meetings of psychiatry, oncology, and MICU physicians and nurses and dissemination of the results.
- Collaboration and weekly multidisciplinary meetings (Intensivists, Hospitalists, psychiatrists, Nurses, PT, RT, OT, and pharmacists).
John Hopkins Experience

- Research in delirium screening showed a high prevalence of delirium
- Research on long-term mental health outcomes confirmed common PTSD in ICU survivors
John Hopkins QI Initiatives

- Minimize benzodiazepine and narcotics
- Reduce immobility
- Marked increase in the proportion of MICU days without delirium (21% vs 53%, P = .003)
Question 6

- The first line agent of choice in a patient with hyperactive delirium and a normal EKG is:
  a) Haloperidol
  b) Olanzapine
  c) Lorazepam
  d) Quetiapine
  e) Risperidone
Question 6

- **The first line agent of choice in a patient with hyperactive delirium and a normal EKG is:**
  - a) Haloperidol
  - b) Olanzapine
  - c) Lorazepam
  - d) Quetiapine
  - e) Risperidone
What to **THINK** When Delirium Is Present

**Toxic Situations**
- CHF, shock, dehydration
- Delirigenic meds (Tight Titration)
- New organ failure, eg, liver, kidney

**Hypoxemia**

**Haloperidol / atypical antipsychotics**

**Infection/sepsis (nosocomial)**

**Immobilization**

**Nonpharmacologic interventions**
- Hearing aids, eye glasses, reorient, sleep,
  music, noise, ambulation

**K+ or Electrolyte problems**

*Hipp & Ely Neurotherapeutics 2012;9:158-75*
DC meds that can induce delirium

- Many sedatives and analgesics
- Drugs with anticholinergic activity (diphenhydramine)
- Benzodiazepines (lorazepam, midazolam)
- Propofol
- Opiates (fentanyl, morphine, oxycodone)
Delirium: Pharmacologic Therapy

- Pharmacological – no accepted strategy
  - Anti-psychotics (off label use)
  - Cholinesterase inhibitors
  - Dexmedetomidine
  - Melatonin; gabapentin
- Symptomatic treatment
  - Identification/ reduction of stressors
## Delirium: Pharmacologic Therapy

<table>
<thead>
<tr>
<th>Agent</th>
<th>Drug Class</th>
<th>Dosage</th>
<th>Benefits</th>
<th>Adverse Effects</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haloperidol</td>
<td>Typical</td>
<td>0.25-1mg po/IV q4h prn agitation</td>
<td>Nonsedating; few HD effects</td>
<td>EPS, especially if &gt; 3 mg/d</td>
<td>Usually, agent of choice†</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>Atypical</td>
<td>2.5-10mg po daily; dissolving tablet; IV/IM: 2.5-10mg</td>
<td>Fewer EPS than haloperidol</td>
<td>More sedating than haloperidol</td>
<td>Small trials‡ PO route less effective</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>Atypical</td>
<td>25-50mg po BID</td>
<td>Fewer EPS than haloperidol</td>
<td>Most sedating of atypicals; low BP</td>
<td>Small trials‡</td>
</tr>
<tr>
<td>Risperidone</td>
<td>Atypical</td>
<td>0.25-1mg po/IV q4h prn agitation</td>
<td>Nonsedating; few HD effects</td>
<td>? fewer EPS than haloperidol</td>
<td>Small trials‡</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>Benzodiazepine</td>
<td>0.25-1mg po/IV TID prn agitation</td>
<td>Sedative EtOH w/d, Hx of NMS</td>
<td>Paradoxic excitation, resp depression</td>
<td>Second-line</td>
</tr>
</tbody>
</table>
Pharmacologic Therapy

- Benzodiazepines ONLY for withdrawal from alcohol or benzodiazepines. Occasionally used as an adjunct for control of agitation with hyperactive delirium.
  - cause sedation, disinhibition, can precipitate delirium
- In ICU patients, dexmedetomidine can decrease the duration of hyperactive delirium.
CVICU Delirium Order Set

(medications)

Delirium - Enteral Access Available
- Quetiapine 50 mg tab(s) (SEROquel)
  50 mg, ORAL, EVERY 8 HOURS, First Dose Today at 1500, Until Discontinued
  Notify physician/LP if QTc greater than 480ms
- Haloperidol lactate 5 mg injection (HALDOL)
  5 mg, INTRAVENOUS, EVERY 4 HOURS AS NEEDED starting Today at 1445 Until Discontinued. Agitation
  If patient requires greater than 2 doses within 8 hours or continues to have positive CAM-ICU, call physician/LP to consider increasing scheduled antipsychotics
- Initiate QTc reporting on monitor
  Routine, ONGOING First occurrence Today at 1445 Until Specified
  Specify: Initiate QTc reporting on monitor
- Dexmedetomidine 400 mcg in NaCl 0.9% 100 mL (PRECEDEX)
  0.3-1 mcg/kg/hr, INTRAVENOUS, CONTINUOUS for 24 hours. For ICU use ONLY for treatment of agitation/GIVE INITIAL BOLUS? (CLICK HERE AND HIT IT)
  Notify physician

Delirium - NO Enteral Access Available
Delirium - Requires IV Only
Delirium - Prolonged QTc (Greater than 480-500ms)
Outcomes of interest

• Mortality
• LOS
• Cost per case
• Surrogate outcomes
  – Restraint use
  – Neuroleptics
  – Sitter use
Other Considerations When a Patient has Delirium

- When to call psych
  - Younger, SUD, mental illness

- When to call geriatrics or consult a GRN (geriatric resource nurse)
  - Age > 65, dementia, social issues; more than delirium

- When to get head CT
  - Focal deficits, trauma, or fall

- When to call CIT?
  - Danger to self or others
Common Recommendations from the Guidelines Reviewed

- Risk factor modification in hospital:
  - Target of prevention strategies
  - 40% relative reduction

- Success variable
  - Patient population
  - Specific plan
  - Compliance with implementation

- Need for studies in ICU setting
  - Great margin for improvement (higher baseline prevalence and longer duration)
Delirium in the Hospitalized Patient

Laura Schenck MBA, BSN, RN, CCRN
Nurse Manager
Cleveland Clinic
Cardiothoracic Intensive Care Unit
Objectives

- Importance of prevention and treatment of delirium in the critically ill
- How delirium effects the patient and their loved ones
- Principles of prevention and management from the nursing perspective
Definition of Delirium

• Confusion that comes on quickly, sometimes within hours

• Patients can’t think clearly
  - Inattention
  - Are not aware of what is going on around them

• May have hallucinations
Causes of Delirium

• Surgery/anesthesia
• Drug or alcohol withdrawal
• Infections
• Mental illness
• Severe pain
• Prolonged lack of sleep
What can RN’s do for delirium management?

- Screen for delirium risk
- Monitor for delirium
- Employ prevention strategies
- Institute non-pharmacologic treatment
Why is detection important?

- Delirium affects both the patient and the family
- 30-90% of adults leave the hospital with unresolved delirium
- Higher risk of morbidity (injury to self and staff)
- Functional and cognitive decline
- Nursing home placement
Tools used to detect delirium

- Many tools available
- Most used and best validated:
  - Confusion Assessment Method adapted for use in the ICU (CAM-ICU)
  - Intensive Care Delirium Screening Checklist (ICDSC)
  - Nursing Delirium Screening Scale (Nu-DESC)
Confusion Assessment Method (CAM-ICU)

• A tool used by nurses to quickly screen for delirium
• Used in mechanically ventilated patients
• Critically ill patients
• Delirium is screened by nurses and diagnosed by the physician or license independent practitioner
History of the CAM-ICU

• The CAM-ICU is an adaptation of the confusion assessment method (CAM)
• The assessment component was changed to allow use in nonverbal, mechanically ventilated patients
• Reliable & valid in ICU patients
Begin with performing sedation assessment

- Assess for sedation using the Richmond Agitation – Sedation Scale (RASS)
- +1 to +4 indicates agitation
- 0 indicates calm
- -1 to -5 indicates sedation
CAM – ICU Overview

The tool is divided into four Features that are assessed and then a final determination is made whether the patient screens positive or negative for delirium.

## DELIRIUM ASSESSMENT

<table>
<thead>
<tr>
<th>Step</th>
<th>Feature</th>
<th>Description</th>
<th>CAM-ICU</th>
<th>CAM-ICU</th>
</tr>
</thead>
</table>
| 2    | Acute Change or Fluctuating Course of Mental Status | - Is there an acute change from mental status baseline?  
- Has the patient's mental status fluctuated during the past 24 hours? | NO | NO DELIRIUM |
|      | YES    |             |         |         |
| 2    | Attention | - “Squeeze my hand when I say the letter ‘A’.”  
- Read the following sequence of letters: SAVEMART  
- Errors: No squeeze with ‘A’ & squeeze on latter other than ‘W’  
- If unable to complete Letters & Pictures | 0 - 2 Errors | NO DELIRIUM |
|      | > 2 Errors |             |         |         |
| 3    | Alert Level of Consciousness | Current RASS level (check back to sedation assessment in Step 6) | RASS other than zero | DELIRIUM Present |
|      |         |             |         |         |
| 4    | Disorganized Thinking | 1. Will a stone float on water?  
2. Are there fish in the sea?  
3. Does one pound weigh more than two?  
4. Can you saw a hammer to pound a nail? | 0 - 1 Error | CAM-ICU negative NO DELIRIUM |
|      | Comments: “Hold up this many fingers” (Hold up 2 fingers). “Now do the same thing with the other hand.” (Do not demonstrate)  
“Add one more finger” (if patient unable to move both arms) |         |         |
CAM – ICU Score

The final score is tabulated and the patient is screened positive for delirium if:

Features 1 **AND** 2 are Positive plus ... Feature 3 **OR** 4 are Present
Non-pharmacologic Treatment

• Treatment of underlying disease
  - electrolyte abnormalities
  - severe pain
  - Hypoxemia
  - severe anemia
  - infections

• Removal and reduction of associated contributing factors
  - Prevention (Non-pharmacological)
    • Adequate sleep
    • Relaxation and quiet environment
    • Orientation
Promote Sleep

- Avoid interruptions at night
- Limit night time noise
- Appropriate nighttime lighting
- Promote relaxation techniques
- Prudent use of hypnotics
Promote orientation / Avoid Cognitive Impairment

- Exposure to sun light during daytime
- Regular verbal reminders of date and location
- Liberal visitation from family and friends
- Visual cues in environment
- Communication board with schedule of days events- ie tests and meals
- Cognitive Stimulating activities
- Avoid non-essential room or unit relocations
- Consistent caregivers
Mobilization

- Avoid tethers
- Ambulate at least three times a day as able. If unable to ambulate
- Early consult to physical therapy if evidence of decline in level of mobility
- Access to walkers and assistive devices
Avoid sensory deprivation

- Ensure hearing aid and glasses available and in working order at bedside
- Provide hearing assistive devices as needed
- Large print reading materials and signs
- Adequate non-glare lighting
Fluid and Nutrition

- Promote adequate hydration
- Consider IV fluids
- Monitor fluid and nutrition intake
- Limit periods of NPO
- Provide adequate assistance with meals
- Ensure assistive devices available at meals
- Ensure dentures available if appropriate
Adequate Pain Management

- Assess pain at regular frequency
- Medicate per pain standards
- Non-pharmacologic pain management
Review Oxygenation

- Assess pulse oximetry regularly
- Avoid hypoxia
Medication Review

- Assess each medication for indication daily
- Avoid or cautious use of benzodiazapines, hypnotics, narcotics and medications with strong anticholinergic effects
# Delirium Report

## Delirium

<table>
<thead>
<tr>
<th></th>
<th>10/22</th>
<th>10/23</th>
<th>10/24</th>
<th>10/25</th>
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</thead>
<tbody>
<tr>
<td>CAM ICU Ass.</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>CAM Assess.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sedation Vec.</td>
<td>No - N... No - N...</td>
<td>No - N... No - N...</td>
<td>No - N... No - N...</td>
<td>No - N... No - N...</td>
</tr>
<tr>
<td>CMA Score</td>
<td></td>
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## Vital Signs

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<tr>
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<th>10/25</th>
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<tbody>
<tr>
<td>Temp</td>
<td>37.7</td>
<td>37.1</td>
<td>38.5</td>
<td>36.4</td>
</tr>
<tr>
<td>Pulse</td>
<td>63</td>
<td>67</td>
<td>61</td>
<td>59</td>
</tr>
<tr>
<td>Resp</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>BP</td>
<td>120/70</td>
<td>131/62</td>
<td>128/63</td>
<td>144/67</td>
</tr>
<tr>
<td>MAP</td>
<td>83</td>
<td>87</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>SPO2</td>
<td>96</td>
<td>97</td>
<td>100</td>
<td>99</td>
</tr>
<tr>
<td>Pain</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>GCS</td>
<td>11</td>
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## Select Labs

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<td>WBC</td>
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<tr>
<td>Hemoglobin</td>
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<td>9.2</td>
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<td>Sodium</td>
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<td>141</td>
<td>141</td>
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<tr>
<td>BUN</td>
<td>17</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>CO2</td>
<td>25</td>
<td>24</td>
<td>21</td>
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# Delirium Report

<table>
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<th>10/17</th>
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<th>10/29</th>
<th>10/30</th>
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<tbody>
<tr>
<td>Glucose</td>
<td>117</td>
<td>182&lt;sup&gt;2&lt;/sup&gt;</td>
<td>120</td>
<td>106</td>
<td>89</td>
<td>101</td>
<td>137</td>
<td>117</td>
<td>83</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bil Gluc mg/dl</td>
<td>200&lt;sup&gt;4&lt;/sup&gt;</td>
<td>153&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>147&lt;sup&gt;2&lt;/sup&gt;</td>
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**Related Rx**
- aminophylline: 10 mg q6h for 48h
- citalopram: 20 mg bid
- dexamethasone: 1 mg q6h
- methylPREDNIS: 1,000 mg for 24h
- oxyCODONE: 2 mg q6h

**Imaging Brain**
- MRI Brain: Normal

**K+ Totals**

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<th>1815</th>
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<th>2758</th>
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<td>1600</td>
<td>1210</td>
<td>1900</td>
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<td>1855</td>
<td>1655</td>
<td>1655</td>
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</tbody>
</table>

**General Chemistry**

<p>| Potassium | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 |
| Creatinine | 0.57 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Protein, Total | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 |
| Calcium | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 |
| Ionized Calcium | 1.30 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 |
| Normalized Ca | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 |
| Magnesium | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Phosphorus | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |</p>
<table>
<thead>
<tr>
<th>Nursing</th>
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</table>
| Activity: Mobilize Patient  
Routine, ONGOING starting Today at 1445 Until Specified  
Washup Frequency: Minimum of 3 times per day  
Head of Bed Position: 30 degrees  
Foot of Bed Position: No restriction |
| Promote oral hydration  
ONGOING |
| Patient may use home sensory aids (glasses, hearing aids, etc)  
Routine, ONGOING First occurrence Today at 1445 Until Specified |
| Discontinue Foley Catheter |
| Vital Signs |
| Pulse Oximetry  
STAT, ONCE (I) First occurrence Today at 1445 Until Specified |
| 6 Hours Uninterrupted Sleep and Omit 0400 Vital Signs  
Routine, ONGOING First occurrence Today at 1445 Until Specified |
| Omit 0400 Vital Signs  
Routine, ONGOING First occurrence Today at 1445 Until Specified |

### Medications

Review ALL medications and consider discontinuing those that may contribute to delirium. Common medications include: benzodiazepines, diphenhydramine, and famotidine (Pepcid).

Medication recommendations:
- More sedating agents select - quetiapine or olanzapine
- Less sedating agent select - haloperidol
- Patients with long QTc select - aripiprazole
- Patients needing emergent treatment - parenteral haloperidol is the agent of choice

### Patients less than 85 years
- Scheduled Only Orders
- PRN Only Orders
- Scheduled + PRN Orders

### For Patients 65 years or Greater
Case 1 – Mrs. Jones

83F HTN, thyroid, GERD, DJD
- Slipped on ice and broke hip, unclear if had LOC
- She is POD #1 s/p ORIF procedure
- Quiet on rounds, sleeping; drowsy most of day, occ wakes up and cries out
- Medicated for pain essentially around the clock
- Restless and agitated at night; trying to get OOB, pulling at lines
Case 1a – Mrs. Jones

- POD#2: the physician orders labs and UA, plain films of abdomen due to tenderness: constipation
- MMSE cannot perform
- He administers a laxative and decreased dose of hydromorphone
- Doing better; hydromorphone specifically ordered prior to therapy for incident pain
Case 2 - Jane

28F admitted for elective OR for pin removal from forearms s/p MVA 2 months ago

- Reports taking Vicodin and being a social drinker” at home
- Postop gets agitated and Visual hallucinations: IV is a spider, trying to get OOB
- Questions?
Case 2 - Jane

- On call physician orders restraints
- On exam found to be hypertensive, tachycardia, tremor, diaphoresis
- Tox screen + opiates, benzodiazepines
- A call to roommate confirms that she consumes a bottle of wine daily; CIWA protocol started
- More calm and redirectable the next day after 8mg cumulative dose of lorazepam
Case 3

- 67M admitted from NH with UTI
- Oriented x 2 at baseline, diabetic with previously good control on oral hypoglycemic (glyburide)
- Agitated and Oriented x zero on POD#2
- QUESTIONS?
Case 3a

- med list review had diphenhydramine
- Consider hypoglycemia
Case 4

- 68F s/p CABG x 2v went well intraop
- POD#3 eyes closed, difficult to arouse, words slurred; unable to respond, picking at things in air
- Restricted affect; confused, ‘in Newfoundland’
- Senior apt, lives alone; increasing forgetfulness but I in ADLs recent 30/30 MMSE at PCP office
- Per family drowsy and confused, worse later in day
Case 4a

- Na 147, BUN 57 otherwise normal
- Dx delirium
- Correct high Na, dehydration
- Hearing aid, reorient, calm environment
- Nonpharm rx
- POD #6 better
Case 4b

- POD #6 not getting any better, pulse ox 90% on 2L
Case 4c

NOW WHAT?

- ABG shows respiratory alkalosis and hypoxemia PO2 68mmHg on 4L NC now
- CT chest shows acute pulmonary embolism in subsegmental LLL