Identifying and Addressing Delirium: Confusion Assessment Measure-ICU

Erin L. Hall, PsyD
Clinical Psychologist
Departments of Trauma Surgery & Critical Care Medicine
Held Hostage Thousands of Miles Away: Delirium in Trauma Surgery Patients

Erin L. Hall, PsyD
Clinical Psychologist
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Disclosures

This speaker has nothing to disclose.
Objectives

✓ Define delirium and identify symptoms and risk factors
✓ Discuss the incidence of delirium and the relationship between trauma and delirium
✓ Identify strategies for assessment and management of delirium
✓ Review outcomes associated with delirium and special considerations for trauma patients
✓ Highlight delirium initiatives in place at Geisinger
What is Delirium and What Does it Look Like?

Define delirium and identify common symptoms and risk factors for delirium
Latin: *de lira*

Meaning “Off the path” or “out of the furrow”
Delirium is Known By Many Names

- Acute mental status change
- Acute confusional state
- Altered mental status
- Sundowning
- Confusion
- Encephalopathy
- ICU psychosis
- Agitation
Delirium: According to the DSM-5

- Acute change in mental status
- Inattention
- Disorientation
- Fluctuating course
- Disturbance in cognition
Delirium May Be Due To:

- Substance intoxication
- Substance withdrawal
- Medication
- A medical condition/organic pathology
- *Multiple etiologies
Delirium is...  

<table>
<thead>
<tr>
<th>Agitation</th>
<th>Sleep disturbance</th>
<th>Hallucinations</th>
<th>Paranoia</th>
<th>Disorientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritability</td>
<td>Anxiety</td>
<td>Memory problems</td>
<td>Lethargy</td>
<td>Purposeless movement</td>
</tr>
<tr>
<td>Incoherent speech</td>
<td>Depressed mood / dysphoria</td>
<td>Confusion</td>
<td>Illusions</td>
<td>Impulsivity</td>
</tr>
<tr>
<td>Self-extubation</td>
<td>Pulling at lines</td>
<td>Climbing out of bed</td>
<td>Difficult to rouse</td>
<td>Poor social awareness</td>
</tr>
</tbody>
</table>
# Associated Features

- Disturbance in sleep-wake cycle
- Emotional disturbances and lability
- Generalized slowing on EEG
- Using inappropriate words or incoherent, illogical speech
- Inability to follow directions
- Personality changes
- Abnormal movements (e.g., tremors, picking, twitching)
- Memory problems
Subtypes of Delirium

**Hypoactive**
- Decreased psychomotor activity
- Sluggishness or lethargy

**Hyperactive**
- Increased psychomotor activity
- Mood lability/agitation
- Refusal to cooperate with care

**Mixed**
- Normal psychomotor activity
- Inattention/problems with awareness
- **OR** fluctuating activity level
Etiology of Delirium

"I WATCH DEATH"

<table>
<thead>
<tr>
<th>Potential causes</th>
<th>Differential diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious</td>
<td>Sepsis, encephalitis, meningitis, syphilis, central nervous system abscess</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>Alcohol, barbiturates, sedative-hypnotics</td>
</tr>
<tr>
<td>Acute metabolic</td>
<td>Acidosis, electrolyte disturbance, hepatic/renal failure, other metabolic disturbances (glucose, magnesium, calcium)</td>
</tr>
<tr>
<td>Trauma</td>
<td>Head, burns</td>
</tr>
<tr>
<td>CNS disease</td>
<td>Hemorrhage, cerebrovascular accident, vasculitis, seizures, tumor</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Acute hypoxia, chronic lung disease, hypotension</td>
</tr>
<tr>
<td>Deficiencies</td>
<td>Vitamin B₁₂, hypovitaminosis, niacin, thiamine</td>
</tr>
<tr>
<td>Environmental</td>
<td>Hypo/hyperthermia, endocrinopathies, diabetes, adrenal, thyroid</td>
</tr>
<tr>
<td>Acute vascular</td>
<td>Hypertensive emergency, subarachnoid hemorrhage, sagittal vein thrombosis</td>
</tr>
<tr>
<td>Toxins/drugs</td>
<td>Medications, street drugs, alcohols, pesticides, industrial poisons, carbon monoxide, cyanide, solvents, etc</td>
</tr>
<tr>
<td>Heavy metals</td>
<td>Lead, mercury</td>
</tr>
</tbody>
</table>

* The above table was adapted from Table 102-1 of Smith and Seirafi,¹⁶ which the authors modified from Wise MG.
Risk Factors for Delirium

Predisposing Factors

• Vulnerabilities (e.g., severe illness, frailty, cognitive impairment, sensory deficits)

Precipitating Factors

• Insults occurring during the hospitalization or associated with the illness/injury

Modifiable vs not modifiable
Risk Factors for Delirium

Modifiable risk factors with moderate or strong evidence of causing delirium:
- Benzodiazepine use
- Blood transfusions
- Use of psychoactive meds (e.g., antipsychotics)

Nonmodifiable risk factors with moderate or strong evidence of causing delirium:
- Greater age
- History of dementia
- Prior coma
- Pre-ICU emergency surgery or trauma
- Higher APACHE and ASA scores
- History of HTN
- Admission due to neurologic disease
- Admission due to trauma
Risk Factors for Delirium in Trauma

- Presence of ethanol on admission
- Lack of insurance
- Chronic ethanol use
- ICU admission
- Age $\geq$ 55
- Burns
- Medicare insurance
- Falls
- Previous history of cardiovascular disease
Risk Factors for Delirium in Trauma

- Lower GCS, age over 45, increased blood transfusions, and higher multiple organ failure score were strongest predictors in one study.
- Another found age over 55 years, positive BAL on admission, and an increased MCV as risk factors.
- Age, nutritional status, medical comorbidities, injury severity, blood loss, and other acute events associated with autonomic hyperactivity.

Other predisposing factors include:
- Male gender, pre-existing dementia and depression, visual and hearing impairment, functional dependence, dehydration and malnutrition, polypharmacy, alcohol abuse, multiple medical comorbidities.
Delirium in Trauma

Precipitating factors of delirium:

• Surgery (delirium is a common postop complication), UTI, constipation, pain, alcohol withdrawal, lower respiratory tract infection, electrolyte abnormality, neurological disorders, sleep deprivation, hypoxia, environmental

• Medication is the sole precipitant in 12-39% of cases

• Most common drug triggers are benzodiazepines, narcotic analgesics, and drugs with an anticholinergic effect

• In trauma ICUs, midazolam use significantly increased rates of delirium
How Common is Delirium and Why Are Trauma Patients Likely to Become Confused?

Discuss the incidence of delirium and describe the relationship between trauma and delirium
Prevalence of Delirium

• 10% - 30% in older individuals presenting to EDs
• 6% - 56% in general hospital patients
• 16% - 87% of ICU patients
• Higher rates seen in patients on mechanical ventilation (i.e., 60-80%)
• Estimated to occur in about half of individuals who have sustained significant physical trauma
Delirium in Trauma

• In elective and emergency surgery populations, incidence of delirium ranges from 4-53.3%
  • Looking at hip fracture data: incidence is 21% with patients with pre-existing cognitive impairment included and 12.5% when they are not
  • For a significant number, delirium precedes surgery for hip repair
• Another study of trauma patients in the ICU found the incidence of delirium to be 67%
• Large retrospective review of adult trauma patients whose admission was linked to ethanol, found an incidence of delirium to be 0.6%
Trauma and Delirium

- Patients with established delirium, where the delirium preceded or sometimes led to the trauma, and incident delirium, which develops as a reaction to the trauma and hospitalization process.

- Delirium in the postinjury setting is likely associated with multiple causes, including physiologic stress, comorbidities, sedatives/analgesics, brain injury, and substance withdrawal.

- Significant number of older adults represented in trauma.

- High rates of substance use/abuse in the trauma population increasing risk for withdrawal-related delirium.

- 50-70% of patients with TBIs develop delirium.
How Do We Know and What Do We Do?

Identify strategies for the assessment and management of delirium
Easy to Miss

- Delirium is commonly misdiagnosed or not recognized at all
- Detection rates are lower in surgical (vs medical) patients

If delirium is not screened for using a validated delirium screening tool it is missed ~75% of time.

Detecting and Managing Delirium

Prevention
- Primary goal in care of patients at-risk for delirium

Recognition
- Routine monitoring, recognizing those at risk, and recognizing delirium early on

Management
- Involves treatment of the underlying cause and pharmacologic and non-pharmacologic intervention
Assessment of Delirium

• Confusion Assessment Measure (CAM-ICU)
• Delirium 4As Assessment
• Intensive Care Delirium screening checklist (ICDSC)
Confusion Assessment Method for the ICU (CAM-ICU) Flowsheet

1. Acute Change or Fluctuating Course of Mental Status:
   - Is there an acute change from mental status baseline? \ OR \ Has the patient’s mental status fluctuated during the past 24 hours?
   - YES

2. Inattention:
   - “Squeeze my hand when I say the letter ‘A’.”
     Read the following sequence of letters:  
     **SAVE A H A R T** or **CASABLANCA** or **ABADBADAY**
     **ERRORS:** No squeeze with ‘A’ & Squeeze on letter other than ‘A’
   - If unable to complete Letters \rightarrow \ Pictures
   - > 2 Errors

3. Altered Level of Consciousness
   - Current RASS level
   - RASS = zero

CAM-ICU negative
NO DELIRIUM

CAM-ICU negative
NO DELIRIUM

CAM-ICU positive
DELIRIUM Present
3. Altered Level of Consciousness
   Current RASS level

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 use a hammer to pound a nail?

   Command: “Hold up this many fingers” (Hold up 2 fingers)
   “Now do the same thing with the other hand” (Do not demonstrate)
   OR “Add one more finger” (If patient unable to move both arms)

[1] ALERTNESS
This includes patients who may be markedly drowsy (eg. difficult to rouse and/or obviously sleepy during assessment) or agitated/hyperactive. Observe the patient. If asleep, attempt to wake with speech or gentle touch on shoulder. Ask the patient to state their name and address to assist rating.

- 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
Ask the patient: “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.

<table>
<thead>
<tr>
<th>Months of the year backwards</th>
<th>Achieves 7 months or more correctly</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Starts but scores &lt;7 months / refuses to start</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Untestable (cannot start because unwell, drowsy, inattentive)</td>
<td>2</td>
</tr>
</tbody>
</table>

[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

<table>
<thead>
<tr>
<th></th>
<th>0</th>
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<tbody>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
</tr>
</tbody>
</table>

4 or above: possible delirium +/- cognitive impairment
1-3: possible cognitive impairment
0: delirium or severe cognitive impairment unlikely (but delirium still possible if [4] information incomplete)

4AT SCORE
### Intensive Care Delirium Screening Checklist (ICDSC)

Give a score of “1” to each of the 8 items below if the patient clearly meets the criteria defined in the scoring instructions. Give a score of “0” if there is no manifestation or unable to score. If the patient scores >4, notify the physician. The diagnosis of delirium is made following clinical assessment; document in the Assessment and Intervention record (RN) and progress note (MD).

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Scoring Instructions</th>
<th>Score</th>
</tr>
</thead>
</table>
| 1. Altered Level of Consciousness*  | • If MAAS portion of VAMAAS is 0 (no response) or 1 (response to noxious stimulus only), record “U/A” (unable to score) and do not complete remainder of screening tool.  
  • Score “0” if MAAS score is 3 (calm, cooperative, interacts with environment without prompting)  
  • Score “1” if MAAS score is 2, 4, 5 or 6 (MAAS score of 2 is a patient who only interacts or responds when stimulated by light touch or voice – no spontaneous interaction or movement; 4, 5 and 6 are exaggerated responses). |       |
|                                     | If MAAS ≠ 0 or 1, screen items 2-8 and complete a total score of all 8 items.                                                                                                                                         |       |
| 2. Inattention                      | “1” for any of the following:  
  • Difficulty following conversation or instructions  
  • Easily distracted by external stimuli  
  • Difficulty in shifting focuses                                                                                                                                         |       |
<p>| 3. Disorientation                   | “1” for any obvious mistake in person, place or time                                                                                                                                   |       |</p>
<table>
<thead>
<tr>
<th></th>
<th>Hallucination/delusions/psychosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>“1” for any of the following:</td>
</tr>
<tr>
<td></td>
<td>Unequivocal manifestation of hallucinations or of behavior probably due to hallucinations (e.g., catching non-existent object)</td>
</tr>
<tr>
<td></td>
<td>Delusions</td>
</tr>
<tr>
<td></td>
<td>Gross impairment in reality testing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Psychomotor agitation or retardation</th>
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<tr>
<td>5.</td>
<td>“1” for any of the following:</td>
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<tr>
<td></td>
<td>Hyperactivity requiring additional sedatives or restraints in order to control potential dangerousness (e.g., pulling out IV lines, hitting staff)</td>
</tr>
<tr>
<td></td>
<td>Hypoactivity or clinically noticeable psychomotor slowing. Differs from depression by fluctuation in consciousness and inattention.</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>Inappropriate speech or mood</th>
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<tr>
<td>6.</td>
<td>“1” for any of the following (score 0 if unable to assess):</td>
</tr>
<tr>
<td></td>
<td>Inappropriate, disorganized or incoherent speech.</td>
</tr>
<tr>
<td></td>
<td>Inappropriate display of emotion related to events or situation.</td>
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</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>Sleep wake/cycle disturbance</th>
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<tbody>
<tr>
<td>7.</td>
<td>“1” for any of the following:</td>
</tr>
<tr>
<td></td>
<td>Sleeping less than 4 hours or waking frequently at night (do not consider wakefulness initiated by medical staff or loud environment).</td>
</tr>
<tr>
<td></td>
<td>Sleeping during most of the day.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Symptom fluctuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>“1” for fluctuation of the manifestation of any item or symptom over 24 hours (e.g., from one shift to another).</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>TOTAL SCORE (0-8/8):</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>A score ≥ 4 suggests delirium. A score &gt; 4 is not indicative of the severity of the delirium.</td>
</tr>
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Adapted with permission (Skrobik, Y) Bergeon, et al, 2001, Intensive Care Medicine
Management of Delirium

2018 SCCM Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU

- No medications should be used to prevent delirium (i.e., Haldol, an atypical antipsychotic, dexmedetomidine, statin, or Ketamine)
- Typical and atypical antipsychotics are not associated with a shorter duration of delirium, reduced duration of mechanical ventilation, ICU LOS, or mortality
- Suggest not using a pharmacologic agent to treat subsyndromal delirium
Management of Delirium

• Patients who experience significant distress secondary to symptoms of a delirium, or who are agitated and may be physically harmful to themselves or others, may benefit from short-term use of Haldol or atypical antipsychotic

• Suggest using dexmedetomidine for delirium in mechanically ventilated adults where agitation is precluding weaning/extubation

• Recommend using multicomponent, nonpharmacologic intervention that is focused on reducing modifiable risk factors

• Suggests using a sleep-promoting, multicomponent protocol
Non-Pharmacologic Management of Delirium

- Avoid physical restraints
- Provide 1:1 care
- Frequent reorientation
- Call bell in close proximity
- Mobilize early and often
- D/c unnecessary lines/tubes/equipment
- Adequate lighting during the day and keep patients awake

- Reduce noise
- Have a clock and calendar visible
- Encourage family to bring in pictures and familiar objects
- Provide glasses, hearing aids, and other assistive devices
Delirium is a Precursor for Long-Term Troubles

Review outcomes associated with delirium and special considerations for trauma patients
Delirium and Adverse Medical Outcomes

- Increased hospital and ICU mortality
- Increased overall mortality at 1 year
- Increased time on mechanical ventilation
- Increased hospital and ICU LOS
- 3x higher rates of functional decline and institutional placement
Cost of Delirium

Increased healthcare cost and expenditure
• Higher estimated ICU costs
• Higher 1-year healthcare costs
• Total $143 - $152 billion nationally
Psychological and Neurocognitive Outcomes

- 1/3 of patients experience depression
- 10-30% of patients experience PTSD
- 1/3 to 2/3 of patients experience lasting cognitive impairment
Figure 1. Postintensive care syndrome (PICS) conceptual diagram. *ASD*, acute stress disorder; *PTSD*, posttraumatic stress disorder. (Needham et al., 2012)
Delirium Care at Geisinger Medical Center

Highlight delirium initiatives currently in place
Delirium Care at Geisinger

• CAM-ICU screening of all patients in the ICU
• Additional screening provided by trauma psychology
• Recommendations provided to trauma team (e.g., management of ETOH withdrawal, medications, etc)
• Provide psychoeducation to family/caregivers about delirium and recovery
• Provide reorientation and recommendations regarding environmental modifications, pharmacologic and non-pharmacologic management
Delirium Care at Geisinger

- Decrease use of deliriogenic medications
- Target better understanding of contributors to delirium
- Increase ambulation and daytime wakefulness of patients
- Recommendations to decrease physical restraint use and time on mechanical ventilation
- Follow throughout hospitalization
- Provide resources, as needed
Post-Intensive Care Survivor Clinic

- Select patients invited for participation
- Clinic case manager follows patients
- Attend visit approximately 4 weeks after hospital discharge
- Evaluation and referral for appropriate follow up
“I was tied down by 2 drunk hookers working as nurses in the ICU. They were taunting me and said they were not going to give me oxygen. Friends of the devil’s cult were sharpening their axes and knives. I'm lucky to be alive.”

Former ICU patient
Thank you