ICU Sedation – Overview of the 2013 Update

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Session Objectives

1. Describe common indications for sedation in critically ill patients.
2. Describe the complications of sedation in critically ill patients.
3. Describe validated tools for assessing sedation, analgesia, and delirium.
4. Describe evidence-based sedation practices.
5. Be familiar with the recently updated clinical practice guidelines for the management of pain, agitation, and delirium in the ICU.

Indications for Sedation

- Medical
  - Reduce oxygen demand
  - Reduce intracranial pressure in traumatic brain injury
- Behavioral
  - Maintain spinal precautions
  - Facilitate ventilator synchrony and patient care
  - Prevent unplanned self-removal of invasive devices (tubes and lines)
- Psychological
  - Maintain patient safety and welfare
  - Minimize pain and discomfort
  - Minimize psychological trauma (control anxiety and provide amnesia)
- Avoid complications & minimize side effects

“Unsafe” Patient

“Safe” but At-Risk

Declaration

- I have no real or potential conflicts of interest to declare.
Harms of Sedation

- More medication side-effects
- Increased time mechanically ventilated
- Prolonged ICU and hospital length of stay
- Increased likelihood of requiring tracheotomy
- Increased risk of medical complication
- Increased health care cost
- Increased psychiatric complications

Goals of Sedation

- “Control Agitation”
  - Agitation is a syndrome
    - A set of symptoms occurring together; the sum of signs of any morbid state; a symptom complex
  - Almost always attributable to
    - Pain
    - Anxiety
    - Delirium
    - Pharmacological withdrawal effects

ICU Care Bundles

- Measuring ICU quality outcomes is difficult
- Process based approach (bundles)
  - Ventilator associated pneumonia prevention
  - Pressure ulcer prevention
  - CVC insertion
  - Sepsis resuscitation
  - MRSA management
  - ** Sedation

Sedation Bundle

Pain → Anxiety → Delirium

Principles → Concepts → Framework

Principles
1. Pain is common at rest and with care
2. Routine assessment must be undertaken using valid tools
**Sedation Bundle – Pain**

**Principles**

3. Treat non-neuropathic pain with opioids
   - Use non-opioids to reduce opioid requirements
   - Use gabapentin or carbamezapine for neuropathic pain
   - Consider thoracic epidural for AAA surgery and rib fractures

4. Preemptively treat painful procedures / care

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**Concepts**

- Validated Assessment Scales
  - Interactive Patient
    - Self Reporting (0-10 scale)
  - Non-interactive Patient
    - Behavioral Pain Score (BPS)
    - Critical-care Pain Observation Tool (CPOT)

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**Behavioral Pain Scale (BPS)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial expression</td>
<td>Relaxed</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Partially tightened (e.g., brow raising)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fully tightened (e.g., orbital closure)</td>
<td>3</td>
</tr>
<tr>
<td>Gritting</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Upper limbs</td>
<td>No movement</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Partially bent</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fully bent with finger flexion</td>
<td>3</td>
</tr>
<tr>
<td>Periorbital retractions</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Tactile responsiveness</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Compliance with ventilation</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Partial and full ventilation for most of the time</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Unable to control ventilation</td>
<td>2</td>
</tr>
</tbody>
</table>

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**Standardization of Care – Pain**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Metric</th>
</tr>
</thead>
</table>
| **Assess** | • Assess 4x/shift & PRN  
  • Use NRS (0-10) or BPS/CPOT | % of time patients monitored 4x/shift  
  • Demonstrate local ongoing compliance |
| **Treat** | • Treat pain within 30 mins  
  • Non-pharm - relaxation  
  • IV opioids +/- non-opioid  
  • Neuropathic pain - Gabapentin/CBZ  
  • AAA surgery / rib # - thoracic epidural | % of time patients are in significant pain (by positive score)  
  % of time pain treatment initiated within 30 mins |
| **Prevent** | • Pre-procedural analgesia  
  • Treat pain first then sedate | % of time patients receive pre-procedural analgesia  
  % compliance with institutional protocols |

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**Sedation Bundle – Anxiety & Agitation**

**Principles**

1. Target light levels of sedation to improve outcomes
   - Use daily sedation interruptions if targeting deeper sedation
2. Assess regularly using valid tools
Sedation Bundle – Anxiety & Agitation

Principles
3. Consider analgesia-first sedation
4. Consider propofol or dexmedetomidine infusions as first line vs. benzodiazepines
5. Use standardized sedation protocols

Richmond Agitation and Sedation Scale (RASS)
- +4: Combative Overly combative, violent, immediate danger to staff
- +3: Very agitated Pulls or removes tube(s) or catheter(s); aggressive
- +2: Agitated Frequent non-purposeful movement, fights ventilator
- +1: Restless Anxious but movements not aggressive vigorous
- 0: Alert and calm
- -1: Drowsy Not fully alert, but has sustained awakening (eye-opening/eye contact) to voice (>10 seconds)
- -2: Light sedation Briefly awakens with eye contact to voice (<10 seconds)
- -3: Moderate sedation Movement or eye opening to voice (but no eye contact)
- -4: Deep sedation No response to voice, but movement or eye opening to physical stimulation
- -5: Unarousable No response to voice or physical stimulation

Sedation Protocol

Standardization of Care – Sedation

<table>
<thead>
<tr>
<th>Standard</th>
<th>Metric</th>
</tr>
</thead>
</table>
| Assess   | • Assess 2 4x/shift & PRN | •% of time patients monitored ≥4x/shift
|          | • Use RASS / SAS | • Demonstrate local ongoing compliance |
| Treat    | • Target light sedation (RASS -2 to 0) | •% of time patients at sedation goal
|          | • If undersedated treat pain, then sedatives PRN | •% of time patients are undersedated
|          | • If oversedated hold infusions until target and resume at 50% of previous dose | •% of time patients are oversedated or fail to have sedation interruption |
Standardization of Care – Sedation

<table>
<thead>
<tr>
<th>Standard</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent</td>
<td>• Consider early mobilization and SBT when at sedation goal&lt;br&gt;• EEG if at risk for seizures or for ICP management&lt;br&gt;• % failed SBTs due to over/undersedation&lt;br&gt;• % patients undergoing EEG if at risk for seizure or ICP&lt;br&gt;• % compliance with institutional protocols</td>
</tr>
</tbody>
</table>

Sedation Bundle – Delirium

**Principles**
1. Delirium is associated with significant morbidity and mortality
2. Risk factors include:
   - Pre-morbid dementia
   - Hypertension
   - Alcoholism
   - High severity of illness at baseline
   - Coma
   - Benzodiazepine exposure

**Concepts**
- Validated Assessment Scales
  - Confusion Assessment Method - ICU (CAM-ICU)
  - Intensive Care Delirium Screening Checklist (ICDSC)
- Prevention and Mitigation
  - Environmental Factors
    - Family presence
    - Glasses/hearing aids
    - Lighting
    - Noise reduction / Ear plugs
  - Fluids, feeding
  - Relaxation – Therapeutic touch / massage, music
  - Promotion of sleep and day-night orientation
  - Early mobilization
  - Avoid benzodiazepines

Intensive Care Delirium Screening Checklist (ICDSC)

<table>
<thead>
<tr>
<th>Patient evaluation</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alerted level of consciousness* (A-E)</td>
<td></td>
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<tr>
<td>If A or B does not complete patient evaluation for the period</td>
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<tr>
<td>Intentionality</td>
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<tr>
<td>Disorientation</td>
<td></td>
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<tr>
<td>Hallucination/delusion-psychosis</td>
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<tr>
<td>Psychomotor agitation or retardation</td>
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<tr>
<td>Inappropriate speech or mood</td>
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<td></td>
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<tr>
<td>Sleep/wake cycle disturbance</td>
<td></td>
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<td></td>
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<tr>
<td>Symptom fluctuation</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total score (0-8)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Level of consciousness:
A: No response, score: None
B: Response to intense and repeated stimulation (loud voice and pain), score: None
C: Response to mild or moderate stimulation, score: 1
D: Normal wakefulness, score: 6
E: Deteriorated response to normal stimulation, score: 1

Int Care Med 2001;27:859-864
### Sedation Bundle – Delirium

**Concepts**

- **Management**
  - Treatment does not improve outcomes
  - Mitigate contributing factors
    - Medical, environmental, pharmacological
  - Pharmacotherapy to control symptoms
- **Many therapeutic options**
  - Typical and atypical antipsychotics
  - Dexmedetomidine
  - Future research

### Standardization of Care – Delirium

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</tr>
</thead>
</table>
| **Assess** | - Assess qShift & PRN  
- Use ICDSC or CAM-ICU  
- Demonstrate local ongoing compliance |
| **Treat** | - Treat pain PRN  
- Optimize environment  
- Avoid BDZ (unless in etoh withdrawal)  
- Consider neuroleptics (unless ↑QTc) |

### Questions

![Image](https://example.com/question-time)