Evidence Based Pain, Agitation, and Delirium Management

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Florida Hospital Orlando
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Objectives

- Discuss evidence based practice for the pharmacologic management of pain, agitation and delirium
78 y/o F admitted from a skilled nursing facility with shortness of breath, cough and fever

PMH: COPD, HTN, CAD, pneumonia

Admitted for suspected pneumonia

Intubated due to worsening respiratory status

Initial pain/agitation/delirium regimen
  ◦ Midazolam 2mg/hr, titrate to RASS -1 to -2
  ◦ Morphine 1mg IV q8h PRN pain
Patient Case

Questions:

- Is this an appropriate initial regimen for the patient?
  - Why?
  - Is there enough information to decide?
    - What other factors should we look for?
    - What are some alternatives?
- How should her pain and sedation level be assessed?
- How should her sedation be titrated?
- What other strategies should be employed?
Society of Critical Care Medicine

- 2013 Clinical Practice Guidelines for Adult Patients in the ICU
  - Pain and Analgesia
  - Agitation and Sedation
  - Delirium

- Components interrelated
Pain

- Incidence
  - ICU patients routinely experience pain
    - At rest
    - With routine ICU care
    - Increased in certain populations (ex post surgical)

- Assessment
  - Behavioral Pain Scale (BPS)
  - Critical-Care Pain Observation Tool (CPOT)
  - Vital signs should not be used alone for pain assessment
# The Behavioral Pain Scale

<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 lowering)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fully tightened (e.g. eyelid closing)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Grimacing</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></td>
<td>Permanently retracted</td>
<td>4</td>
</tr>
<tr>
<td>Compliance with ventilation</td>
<td>Tolerating movement</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Coughing with movement</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fighting ventilator</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Unable to control ventilation</td>
<td>4</td>
</tr>
</tbody>
</table>
## Critical-Care Pain Observation Tool (CPOT)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial expression</td>
<td>No muscular tension observed, Presence of frowning, brow lowering, orbit tightening, and levator contraction, All of the above facial movements plus eyelid tightly closed</td>
<td>Relaxed, neutral</td>
</tr>
<tr>
<td>Body movements</td>
<td>Does not move at all (does not necessarily mean absence of pain), Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements, Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed</td>
<td>Absence of movements</td>
</tr>
<tr>
<td>Muscle tension</td>
<td>No resistance to passive movements, Resistance to passive movements, Strong resistance to passive movements, inability to complete them</td>
<td>Relaxed</td>
</tr>
<tr>
<td>Compliance with the ventilator (intubated patients)</td>
<td>Alarms not activated, easy ventilation</td>
<td>Tolerating ventilator or movement</td>
</tr>
<tr>
<td>OR</td>
<td>Alarms stop spontaneously, Asynchrony: blocking ventilation, alarms frequently activated</td>
<td>Coughing but tolerating</td>
</tr>
<tr>
<td>Vocalization (extubated patients)</td>
<td>Talking in normal tone or no sound</td>
<td>Talking in normal tone or no sound</td>
</tr>
<tr>
<td></td>
<td>Sighing, moaning</td>
<td>Sighing, moaning</td>
</tr>
<tr>
<td></td>
<td>Crying out, sobbing</td>
<td>Crying out, sobbing</td>
</tr>
<tr>
<td>Total, range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opiates</td>
<td>Onset (IV)</td>
<td>T 1/2</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>1-2 min</td>
<td>2-4 hr</td>
</tr>
<tr>
<td>Hydro- morphone</td>
<td>5-15 min</td>
<td>2-3 hr</td>
</tr>
<tr>
<td>Morphine</td>
<td>5-10 min</td>
<td>3-4 hr</td>
</tr>
</tbody>
</table>
Pain treatment decisions

- Factors to consider
  - Age
  - Renal/hepatic function
  - Pain level
  - Is patient opioid tolerant or naïve?
    - Home pain medications
  - Interval to schedule
  - Sources of pain
All available IV opioids, when titrated to similar pain intensity endpoints, are equally effective.

Optimal choice of opioid and dosing regimen for individual patient depends on many factors, including the drug’s pharmacokinetic and pharmacodynamic properties.

Nonopioid analgesics may be used to decrease the amount of opioids administered.
Delirium

Pain

Agitation
Agitation and Sedation

- **Incidence**
  - Agitation and anxiety occur frequently in critically ill patients
  - Associated with adverse clinical outcomes

- **Assessment**
  - Richmond Agitation-Sedation Scale (RASS)
  - Sedation-Agitation Scale (SAS)
Sedation management: Why do we care?

- Sedation is a risk factor
  - Cognitive impairment
  - Delirium
  - Post-ICU post traumatic stress disorder
    - Midazolam equivalent $\geq 100 \text{ mg/day (} \sim 4 \text{ mg/hr)}$
    - Mean morphine equivalent $\geq 100 \text{ mg/day (} \sim 4 \text{ mg/hr)}$
    - % of ICU days on opiates is a protective factor!

Bienvenu O.J. Psychological Medicine 2013 (not yet published)
### Richmond Agitation-Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>Score</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
<td>Overtly violent, immediate danger to self and/or staff.</td>
</tr>
<tr>
<td>+3</td>
<td>Very Agitated</td>
<td>Pulls or removes tube(s) or catheters; aggressive</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Frequent non-purposeful movement, fights ventilator</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious, apprehensive, but not aggressive</td>
</tr>
<tr>
<td>0</td>
<td>Alert and calm</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Awakens to voice with eye opening, eye contact (&gt; 10 seconds).</td>
</tr>
<tr>
<td>-2</td>
<td>Light sedation</td>
<td>Briefly awakens with eye contact to voice (&lt; 10 seconds).</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate sedation</td>
<td>Movement or eye opening to voice (no eye contact).</td>
</tr>
<tr>
<td>-4</td>
<td>Deep sedation</td>
<td>No response to voice, but movement or eye opening to physical stimulation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td>No response to voice or physical stimulation.</td>
</tr>
</tbody>
</table>

## Sedation-Agitation Scale (SAS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Dangerous Agitation</td>
<td>Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side</td>
</tr>
<tr>
<td>6</td>
<td>Very Agitated</td>
<td>Requiring restraint and frequent verbal reminding of limits, biting ETT</td>
</tr>
<tr>
<td>5</td>
<td>Agitated</td>
<td>Anxious or physically agitated, calms to verbal instructions</td>
</tr>
<tr>
<td>4</td>
<td>Calm and Cooperative</td>
<td>Calm, easily arousable, follows commands</td>
</tr>
<tr>
<td>3</td>
<td>Sedated</td>
<td>Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again</td>
</tr>
<tr>
<td>2</td>
<td>Very Sedated</td>
<td>Aroused to physical stimuli but does not communicate or follow commands, may move spontaneously</td>
</tr>
<tr>
<td>1</td>
<td>Unarousable</td>
<td>Minimal or no response to noxious stimuli, does not communicate or follow commands</td>
</tr>
</tbody>
</table>
# Treatment Options

<table>
<thead>
<tr>
<th></th>
<th>Propofol (Diprivan®)</th>
<th>Dexmedetomidine (Precedex®)</th>
<th>Midazolam (Versed®)</th>
<th>Lorazepam (Ativan®)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset</strong></td>
<td>10-50 sec</td>
<td>immediate</td>
<td>1-3 min</td>
<td>5-20 min</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>3-10 min</td>
<td>6 min</td>
<td>1-3 hrs, longer with drips</td>
<td>4-8 hrs, longer with drips</td>
</tr>
<tr>
<td><strong>Dosing</strong></td>
<td>5-50 mcg/kg/min</td>
<td>0.1-1 mcg/kg/hr</td>
<td>1-10 mg/hr</td>
<td>1-10 mg/hr</td>
</tr>
<tr>
<td><strong>Side effects</strong></td>
<td>Bradycardia, Hypotension, ↑ triglycerides, Propofol infusion syndrome (PRIS), metabolic acidosis, renal failure</td>
<td>Hypotension, Bradycardia</td>
<td>Respiratory depression, Delirium</td>
<td>Respiratory depression, Delirium, Propylene glycol toxicity (vehicle)</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>Avoid in heart failure, 1.1 calorie/mL due to lipid formula, Avoid long-term use</td>
<td>Useful for sedative weaning, Can be used in non-intubated, Renewal q5days</td>
<td>Accumulates in liver failure, duration of action longer</td>
<td>High risk for delirium, Avoid high-dose, prolonged infusions due to propylene glycol</td>
</tr>
</tbody>
</table>
Sedation management approaches

1) Maintain light sedation levels
2) Daily sedation interruption
3) Light sedation levels PLUS daily interruption

WHICH TO USE???
ICU Light vs. Deep Sedation Approach Comparative Trials

- Lots of evidence!
- Ligher sedation arms
  - Shorter duration of mechanical ventilation
  - No increase in clinically significant physiologic stress (e.g. myocardial ischemia)
  - Less (or no change) in PTSD

Crit Care Med 1999; 27: 2609
CHEST 1098; 114:834-6.

Crit Care Med 2007; 35: 365
Anesth Analhg 1997; 85:971.
Anesthesiology 1997; 86: 785-96
Crit Care Med 2003; 830

Intensive Care Med 2006; 32: 93
Am J Respir CCM 2003; 168:1457
Daily Interruptions of Sedatives
Kress et al.

- Randomized, controlled trial, N=128
- Midazolam or propofol and morphine infusions
- Interrupted daily until patient responded or became agitated
- Restarted at HALF the previous rate if needed
- Intervention group had
  - Shorter duration of mechanical ventilation (4.9 vs 7.3, p=0.004)
  - Shorter length of stay in ICU (6.4 vs 9.9 days, p=0.02)
  - No difference in overall length of hospitalization
  - No difference in complications (self extubation)

Daily Interruptions of Sedatives
Mehta et al.

- Randomized, controlled trial, N=430
- Protocolized sedation titrated to light sedation vs protocolized with daily interruption
- If indicated, resumed at HALF the previous rate
  - No differences
    - Duration of mechanical ventilation (both 7 days)
    - Length of stay in ICU (both 10 days)
    - Overall length of hospitalization (both 20 days)
  - Interpretation: Addition of daily interruption did not change outcomes

Maintain light levels of sedation (RASS -1 to -2) unless there is a contraindication

Use EITHER light level of sedation or daily interruption

Nonbenzodiazepine sedatives (propofol or dexmedetomidine) preferred in mechanically ventilated patients

- Intermittent pushes alternative strategy to continuous sedation

Choice should be driven by:

1. Specific indications and sedation goals for each patient
2. The clinical pharmacology of the drug
3. Overall costs
Exceptions

- Some patients need deeper sedation!
  - Facilitate mechanical ventilation
    - Poor oxygenation
    - Aggressive ventilator settings
    - Oscillator
  - Neuromuscular blockers
  - High risk of self extubation or self harm
  - History of drug and ethanol abuse
Delirium

- **Cardinal features**
  - A disturbed level of consciousness (i.e., a reduced clarity of awareness of the environment), with a reduced ability to focus, sustain, or shift attention
  - Either a change in cognition (i.e., memory deficit, disorientation, language disturbance), or the development of a perceptual disturbance (i.e., hallucinations, delusions)

- **Subtypes**
  - Hyperactive (agitated)
  - Hypoactive (calm or lethargic)

- **Assessment**
  - CAM-ICU or ICDSC

Delirium Risk Factors

- Four baseline risk factors positively and significantly associated with the development of delirium in the ICU:
  1. Preexisting dementia
  2. History of hypertension
  3. Alcoholism
  4. High severity of illness at admission

- Independent risk factors:
  - Coma
  - Benzodiazepine use
Benzodiazepines and Delirium

- Varying study findings
- Increased development of delirium\(^1\)\(^-\)\(^2\)
  - Lorazepam shown to be an independent risk factor\(^2\)
- Associated with longer delirium duration\(^3\)
- \(~20\%\) less delirium in a population treated with dexmedetomidine than benzodiazepines in 2 studies\(^4,5\)
- Other studies showed no relationship\(^6\)\(^-\)\(^8\)

Potential Reasons For Different Findings

- Use of different benzodiazepines
  - Midazolam vs. lorazepam
- Studies not powered as primary analysis
- Different patient populations
- General consensus:
  - Potential association
Do any meds need to be stopped or lowered?

- Especially consider **sedatives**
- Is patient on minimal amount necessary?
  - Daily sedation cessation
  - Targeted sedation plan
- Do sedatives need to be changed?

**Toxic Situations**
- CHF, shock, dehydration
- Deliriogenic meds (tight titration)
- New organ failure (liver/kidney)

**Hypoxemia**

**Infection/sepsis (nosocomial)**

**Immobilization**

**Nonpharm interventions**
- Hearing aids, glasses, reorient, sleep protocols, music, noise control, ambulation

**K⁺ or electrolyte problems**
<table>
<thead>
<tr>
<th></th>
<th>Haloperidol (Haldol®)</th>
<th>Quetiapine (Seroquel®)</th>
<th>Risperidone (Risperdal®)</th>
<th>Olanzapine (Zyprexa®)</th>
<th>Ziprasidone (Geodon®)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peak Plasma Time</strong></td>
<td>2-6 hr (PO) 10-20 mins (IM)</td>
<td>1.5 hr (IR) 6 hr (XR)</td>
<td>1 hr</td>
<td>6 hr (PO) 15-45 mins (short-acting IM) 7 days (ER-IM)</td>
<td>6-8 hr (PO) ≤ 60 mins (IM)</td>
</tr>
<tr>
<td><strong>Half Life</strong></td>
<td>18 hr 3 weeks (decanoate)</td>
<td>6 hr (IR) 7 hr (XR)</td>
<td>20 hr (PO) 3-6 days (IM)</td>
<td>21-54 hr (IR) 30 days (ER Injection)</td>
<td>7 hr (PO) 2-5 hr (IM)</td>
</tr>
<tr>
<td><strong>Dosing</strong></td>
<td>1-5 mg q4-6h</td>
<td>50 mg PO BID</td>
<td>1 mg PO BID</td>
<td>2.5 - 5 mg PO Qday</td>
<td>10 mg IM q2h or 20 mg q4h</td>
</tr>
<tr>
<td><strong>Side effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QT prolongation</td>
<td>IV/high doses-high PO-Low</td>
<td>Low-to-Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Anti-cholinergic</td>
<td>low</td>
<td>Low Dry mouth</td>
<td>rare</td>
<td>low</td>
<td>rare</td>
</tr>
<tr>
<td>Sedation</td>
<td>low</td>
<td>moderate</td>
<td>low</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>EPS</td>
<td>highest</td>
<td>rare</td>
<td>moderate</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>Weight gain</td>
<td>low</td>
<td>moderate</td>
<td>moderate</td>
<td>highest</td>
<td>rare</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>- Can dose based on 25% of bolus doses required</td>
<td>- Metabolic changes - Dyslipidemia - Hyperglycemia</td>
<td>- Can contribute to delirium - Renal/hepatic dose adjustments - Parkinsonism</td>
<td>- Metabolic changes - Dyslipidemia - Hyperglycemia</td>
<td>- IM x 3 days only - Use with caution in renal/hepatic - Max dose 40mg/day</td>
</tr>
</tbody>
</table>
Delirium: Critical Care Medicine Recommendations

- Prevention
  - Perform early mobilization
  - For patients at risk, infusions of dexmedetomidine rather than benzodiazepines may be associated with lower prevalence
    - No recommendations for use
  - No recommendation for using a pharmacologic delirium prevention protocol

- Treatment
  - No published evidence that treatment with haloperidol reduces duration of delirium in ICU patients
  - Atypical antipsychotics may reduce the duration of delirium
Putting it together!!

Pain    Agitation    Delirium
Strategies for Management

- Early mobilization
- Promoting sleep by optimizing patients’ environments
- Provider education
- Use of protocols and order forms
- Quality ICU rounds checklists to facilitate the use of pain, agitation, and delirium guidelines or protocols
  - Aim for a light target level of sedation in mechanically ventilated patients
  - Analgesia-first sedation use

Florida Hospital Orlando initiatives

- Implement CAM-ICU screening twice daily
- Change to CPOT pain assessment
- Pharmacy and interdisciplinary involvement
- ABCDE Bundle Rounds
- PAD order set trial
Sedation Weaning Order Set

- Education to RN’s and pharmacy by MD and pharmacist
  - Daily energizers
  - Staff meetings
  - One on one with each included patient
  - One on one to day and night shift
  - During interdisciplinary rounds

- Daily screening (weekday) of 40 MICU/CCU patients by MD and pharmacist for order set use

- Paper orders scanned to pharmacy

- Edits to order set periodically based on nursing and physician feedback
Study Design

- Retrospective case control study
- Primary outcome endpoints:
  - Time on continuous sedation (hours)
- Secondary outcome endpoints:
  - Total sedation usage (measured as number of sedative drips removed from automated dispensing cabinet for patient)
  - ICU length of stay
  - Ventilator length of stay (hours)
  - Re-intubation rates (yes/no)
Inclusion/Exclusion Criteria

- Inclusion
  - Order set utilized (study group) between October 1, 2012 and March 15, 2013 OR
  - Continuous infusion midazolam and fentanyl for > 24 hours in 5800 unit
Exclusion Criteria

- Age <18
- Prisoners
- Palliative Care/terminal condition (cancer, end stage heart disease)
- Receiving neuromuscular blockers at time sedation
- Chronic respiratory failure prior to admission
- Continuous sedation used for < 24 hours
## Results- Demographics Comparison

<table>
<thead>
<tr>
<th></th>
<th>Age (mean)</th>
<th>History Etoh/drug use/psych/dementia (%)</th>
<th>FiO2 (mean)</th>
<th>PEEP (mean)</th>
<th>On one pressor</th>
<th>PRN sedation used prior to starting pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control n=35</td>
<td>56.5</td>
<td>6 (17)</td>
<td>45</td>
<td>6.2</td>
<td>16 (46)</td>
<td>22 (63)</td>
</tr>
<tr>
<td>Intervention n=35</td>
<td>68.4</td>
<td>7 (20)</td>
<td>40</td>
<td>5.6</td>
<td>12 (34)</td>
<td>14 (40)</td>
</tr>
<tr>
<td>$p$ value</td>
<td>0.002</td>
<td>0.758</td>
<td>0.063</td>
<td>0.120</td>
<td>0.329</td>
<td>0.056</td>
</tr>
</tbody>
</table>

- Similar baseline characteristics

# Pilot Outcomes

<table>
<thead>
<tr>
<th>Rass ≥+1 24hr prior to pilot (mean)</th>
<th>RASS ≥+1 24 hr post pilot (mean)</th>
<th>Hr until fentanyl off (median)</th>
<th>Hr until Versed off (mean)</th>
<th>Hr Precedex used (median)</th>
<th># of PRN fentanyl doses given (mean)</th>
<th># of PRN Versed doses given (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>2</td>
<td>9</td>
<td>3.6</td>
<td>70</td>
<td>2.8</td>
<td>3.7</td>
</tr>
</tbody>
</table>

- ~1 greater RASS of +1/24 hrs than prior to pilot
- Potential underutilization of PRN doses of and versed
## Results- Sedation Use

<table>
<thead>
<tr>
<th></th>
<th>Hrs on sedation (mean)</th>
<th>Total # drips dispensed (mean)</th>
<th># Benzo drips dispensed (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>252.2</td>
<td>27.6</td>
<td>7.3</td>
</tr>
<tr>
<td>n=35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>150.3</td>
<td>12.6</td>
<td>2.7</td>
</tr>
<tr>
<td>n=35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p value</strong></td>
<td>0.0025</td>
<td>&lt;0.001</td>
<td>0.0029</td>
</tr>
</tbody>
</table>

- 100 Less hours on sedation
- 15 Less total sedation drips dispensed
- 4.6 Less benzodiazepine drips dispensed
- All p values significant

# Results - Ventilator and ICU LOS

<table>
<thead>
<tr>
<th></th>
<th>ICU LOS (mean days)</th>
<th>Vent LOS (median days)</th>
<th>Reintubated n (%)</th>
<th>Mortality n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>16.5</td>
<td>8.56</td>
<td>5 (14)</td>
<td>9 (26)</td>
</tr>
<tr>
<td>n=35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>11.5</td>
<td>7.38</td>
<td>3 (9)</td>
<td>8 (23)</td>
</tr>
<tr>
<td>n=35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p value</strong></td>
<td>0.011</td>
<td>0.07</td>
<td>0.452</td>
<td>0.78</td>
</tr>
</tbody>
</table>

- ICU LOS - 5 days shorter
- Vent LOS - 1.18 days shorter
- Similar reintubation rates and mortality

Results summary

- Sedation use decreased
- Time on continuous sedation decreased
- Decrease in ICU LOS
Single way to order sedation regimens

Components:
- Target RASS -1 to -2
- Sedation vacation
- Pain first!
- Sedation duration expected <72 hours
  - Non-benzodiazepine strategies
- Sedation duration expected >72 hours
  - Consider non-benzodiazepines
  - Benzodiazepine intermittent dosing preferred
    - Midazolam preferred to lorazepam
  - Continuous infusions for select patients only
Integrated Approach to PAD

- MD Champion
- RN Champion
- RT Champion
- Pharmacy Champion
- Physical Therapy Champion
- Hospital Administrators
- Family
- Patient

Integrated Approach to PAD

Courtesy J Barr, MD
Changing Practice Behaviors

- Keys to Success

4 E’s
- Engage
- Educate
- Execute
- Evaluate
4 E’s of Implementation

- Engage/ stimulate interest!
  - Nurse educator
  - Physician champions
  - Grand rounds and faculty meetings

- Educate
  - New sedation protocol, RASS, CAM-ICU
  - Nursing- lectures, one-on-one, case studies, quiz
  - Physicians- pocket card
4 E’s of Implementation

- **Execute**
  - New sedation protocol
  - Nurse report Cam-ICU, RASS goal, and RASS scores at rounds
  - Move to CPOT pain assessment

- **Evaluate**
  - Monthly barrier review by team
  - MICU pharmacist feedback at rounds (protocol adherence, delirium management)
  - Audit RASS and CAM-ICU documentation
Patient Case revisited

- 78 y/o F admitted from a skilled nursing facility with shortness of breath, cough and fever
- PMH: COPD, HTN, CAD, pneumonia
- Admitted for suspected pneumonia
- Intubated due to worsening respiratory status
- Initial pain/agitation/delirium regimen
  - Midazolam 2mg/hr, titrate to RASS -1 to -2
  - Morphine 1mg IV q8h PRN pain
Patient Case

Questions:

◦ Is this an appropriate initial regimen for the patient?
  • Why?
  • What are some alternatives?
◦ How should her pain and sedation level be assessed?
◦ How should her sedation be titrated?
◦ What other strategies should be employed?
Evidence Based Pain, Agitation, and Delirium Management

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