Patient Assessment and Monitoring for Opioid-Induced Sedation and Respiratory Depression

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Objectives

• Participants will be able to:
  • Discuss the American Society for Pain Management Nursing (ASPMN) Guidelines on Monitoring Opioid-Induced Sedation and Respiratory Depression.
  • Identify Recommendations to Minimize Opioid-Induced Sedation and Respiratory Depression.
American Society for Pain Management Nursing Guidelines on Monitoring for Opioid-Induced Sedation and Respiratory Depression

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Background

- Opioids 2nd Reported Hospital Adverse Event – Medications
- Sedation and Respiratory Depression Most Reported
- 2010 Joint Commission Opioid Related Events
  - Death/Permanent Loss of Function 0.25% of all events (2004-2010)
  - Increase LOS and Costs
  - On the Rise
Background

- 2008 ASPMN Convened Expert Panel
  - Recommendations - Assessment and Monitoring
  - Adult Hospitalized Patients
  - Noncritical Care Settings
    - Medical-Surgical Populations
    - Postsurgical Pain
    - Trauma Pain
    - Acute Pain – Medical Conditions
Background

- Not Applicable
  - Chronic Pain
  - End of Life
- Risk from Opioid Use
  - Sedation
  - Respiratory Depression
Background

• Compilation
  • Scientific Literature
    • Meta-analyses
    • Systematic reviews
    • RCT’s
    • Quasi & Nonexperimental Studies
• State of the Practice
• Published Evidence-Based Guidelines
• Consensus-Based Opinions ASPMN Panel
Evidence Categories

- Category A – Strong Evidence
- Category B – Suggestive Evidence
- Category C – Equivocal Literature
- Category D – Insufficient Evidence
- Opinion-Based Evidence
Recommendations Categories

- Individual Risks
- Iatrogenic Risks
- Pharmacology
- Monitoring
Individual Risks

- Sleep Disordered Breathing (B)
  - Obstructive Sleep Apnea - recurrent absence of breath for periods of >10 seconds owing to collapse of the lower posterior pharynx.
  - Central Sleep Apnea - absence of breath for periods of >10 seconds owing to the temporary loss of ventilatory effort.
Sleep Disordered Breathing

- Opioids
  - Increase Sedation
  - Increase Respiratory Depression

- Increase Post-Operative Complications
TABLE 2.
Risk Factors for Opioid-Induced Respiratory Depression

Patient may have one or more of the following to be considered high risk:
Age >55 years
Obesity (e.g., body mass index ≥30 kg/m²)
Untreated obstructive sleep apnea
History of snoring or witnessed apneas
Excessive daytime sleepiness
Retrognathia
Neck circumference >17.5”
Preexisting pulmonary/cardiac disease or dysfunction, e.g., chronic obstructive pulmonary disease, congestive heart failure
Major organ failure (albumin level <30 g/L and/or blood urea nitrogen >30 mg/dL)
Dependent functional status (unable to walk 4 blocks or 2 sets of stairs or requiring assistance with ambulation)
Smoker (>20 pack-years)
American Society of Anesthesiologists patient status classification 3-5
Increased opioid dose requirement
  Opioid-naive patients who require a high dose of opioid in short period of time, e.g., 10 mg IV morphine or equivalent postanesthesia care unit (PACU)
  Opioid-tolerant patients who are given a significant amount of opioid in addition to their usual amount, such as the patient who takes an opioid analgesic before surgery for persistent pain and receives several IV opioid bolus doses in the postanesthesia care unit followed by high-dose IV patient-controlled analgesia (PCA) for ongoing acute postoperative pain
First 24 hours of opioid therapy (e.g., first 24 hours after surgery is a high-risk period for surgical patients)
Pain is controlled after a period of poor control
Prolonged surgery (>2 hours)
Thoracic and other large incisions that may interfere with adequate ventilation
Concomitant administration of sedating agents, such as benzodiazepines or antihistamines
Large single-bolus techniques, e.g., single-injection neuraxial morphine
Continuous opioid infusion in opioid-naive patients, e.g., IV PCA with basal rate
Naloxone administration: Patients who are given naloxone for clinically significant respiratory depression are at risk of repeated respiratory depression

Stop-Bang Questionnaire

Height/Weight _____
Age _____
Male/Female
BMI _____
Collar size of shirt: S, M, L, XL, or _____ inches/cm
Neck circumference* _____ cm

1. Snoring
   - Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?
   - Yes No
2. Tired
   - Do you often feel tired, fatigued, or sleepy during daytime?
   - Yes No
3. Observed
   - Has anyone observed you stop breathing during your sleep?
   - Yes No
4. Blood pressure
   - Do you have or are you being treated for high blood pressure?
   - Yes No
5. BMI
   - BMI more than 35 kg/m2?
   - Yes No
6. Age
   - Age over 50 yr old?
   - Yes No
7. Neck circumference
   - Neck circumference greater than 40 cm?
   - Yes No
8. Gender
   - Gender male?
   - Yes No
* Neck circumference is measured by staff

High risk of OSA: answering yes to three or more items
Low risk of OSA: answering yes to less than three items
Recommendations

- Comprehensive preadmission, admission, preopioid therapy assessments
- Nurse Handoff Communication
- Education of Risk Factors
- Pain Assessment, Documentation, Risk, CPAP/BiPAP Policies
Which patient-specific parameter(s) might cause you to consider reducing the initial dose of an opioid?

a. Hypertension
b. Sedation following administration of an opioid
c. A history of obstructive sleep apnea
d. A and C
e. B and C
f. A, B, and C
Iatrogenic Risks

- Pain therapy-related variables
- Environmental factors
- Hospital workplace circumstances
Iatrogenic Risks

- Neuraxial Therapy
  - Less RD Basal Epidural than IV
- Supplemental Opioids with Peripheral Local Anesthetic Infusions – (A) RD
- IV, SC, Patient Controlled Analgesia (A)
  - Similar risk IV Push and PCA
  - Patient variables
    - Age, surgery, unauthorized use of PCA
  - Increase with Basal Rate
  - Rapid Titration
Continued Iatrogenic Risks

• Coadministration Antihistamines (D)
  • Increase Sedation, Respiratory Depression, Constipation and Urinary Retention

• Coadministration Benzodiazepines (D)
  • Reduce Respiratory Drive from Sedation

• Timing (Post-Operative Patient) (B)
  • 24 hours after surgery
  • 2300 – 0700
  • 24 hours of Opioid Therapy
  • 12 hours from Last Dose of Hydrophilic Neuraxial Therapy
Continued Iatrogenic Risks

- Environment (B)
  - Less Stimulation
- Hand-off Communication (B)
  - SBAR (Situation, Background, Assessment and Recommendation)
- Staffing (B)
  - Lower patient/nurse ratios
  - BSN or higher
  - Higher # RN’s
  - More Experience
Continued Iatrogenic Risks

• Pain Team/Service - ? (C)
• Greatest Concern
  • Methods of opioid administration
  • Nursing practice
    • Staffing
    • Communication
Question

Which of the following patient-specific parameters is/are the most important to monitor in patients receiving IV opioids?

a. Patient reported pain intensity
b. Level of sedation
c. Adequacy of ventilation
d. Respiratory rate
e. A and D
f. A, B, and C
Pharmacology

• Opioids (C)
  • No difference between Morphine, Dilaudid and Fentanyl
• Acetaminophen (A) – No Effect
• NSAID’s (A) – Reduce Sedation
• Anticonvulsants (A) – Increase Sedation
• Antidepressants (D) - ?
• Clonidine (C) – Sedation >150 μg
Pharmacology

- Ketamine (C) – No Increase Sedation or RD with Opioids
- Dexmedetomidine (C) – Opioid Sparing/TBD
Question
Which of the following agent(s) can potentiate the effects of an opioid on ventilation?

a. Atorvastatin
b. Fluoxetine
c. Alprazolam
d. A and C
e. B and C
Patient Monitoring Practices

- Opioid-Induced Sedation Monitoring
  - Opioid therapy
  - Patient
  - Risk Factors
  - Treatment Response
- Sedation Scales
  - Wanted vs. Unwanted Sedation
<table>
<thead>
<tr>
<th>Name</th>
<th>Original Report</th>
<th>Validation study</th>
<th>Population</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldrete Scoring System</td>
<td>Aldrete &amp; Kroulik, 1970;</td>
<td>—</td>
<td>Adult PACU</td>
<td>—</td>
</tr>
<tr>
<td>Ramsay/Modified Ramsay Scale</td>
<td>Ramsay et al., 1974</td>
<td>Carrasco, 1993</td>
<td>102 adult</td>
<td>1,040 measurements (? no. of raters)</td>
</tr>
<tr>
<td>Kendal Scale</td>
<td></td>
<td></td>
<td>ICU</td>
<td>—</td>
</tr>
<tr>
<td>Sedation Agitation Scale (SAS)</td>
<td>Riker, 1994</td>
<td>—</td>
<td>Adult ICU</td>
<td>IRR = weighted k = 0.91; superior to GCS (weighted κ = 0.64)</td>
</tr>
<tr>
<td>Richmond Agitation and Sedation Scale (RASS)</td>
<td>Sessler, 2002</td>
<td>Ely, 2003</td>
<td>Adult ICU</td>
<td>—</td>
</tr>
<tr>
<td>Pasero Opioid-Induced Sedation Scale (POSS)</td>
<td>Pasero, 1994</td>
<td>Nisbet &amp; Mooney-Cotter, 2009</td>
<td>96 Adult Med/Surg Nurses</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(written scenario)</td>
<td>96 scores from staff nurses on the same written clinical scenario illustrating advancing sedation</td>
</tr>
</tbody>
</table>
Patient Monitoring Practices

- Opioid-Induced Respiratory Depression
  - < 8-10 breaths/min
  - < SpO2 levels
  - > ETCO2 levels

- Respiratory Assessment
  - Depth and Rhythm
  - Work of Breathing
  - Use of Accessory Muscles
  - Symmetric Chest Movement
  - Auscultation of Lung (Stethoscope)
Patient Monitoring Practices

• Respiratory Assessments Prevent AE
• Need for Respiratory Assessment Competencies
• Nurses are not doing Respiratory Assessments!
• More Research on Respiratory Monitoring
  • Reduce RD
  • Improve Post-Op Recovery
  • Eliminate Naloxone

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Patient Monitoring Practices

• Technology Supported Monitoring
  • Pulse oximetry
  • Capnography
  • Technology monitoring systems/medications
    • TBD
    • Maybe with High Risk Patients
Patient Monitoring Practices

- Pulse Oximetry Monitoring
  - OR and PACU settings
- Cochrane Review
  - Is Capable of Detecting Hypoxemia
  - Questioned if improved patient outcomes/care
- Limited
  - Ventilation not assessed
  - Can have high O2 levels despite RD with O2 therapy
  - Spot Checks can stimulate patient higher levels
  - Darker skin false high SpO2 levels
Patient Monitoring Practices

• Capnography
  • Perfusion and Ventilation
  • More sensitive
  • Early indicator RD
    • Decreased central respiratory drive
    • Diminished chemoreceptor responsiveness
    • Decreased airway tone
    • Quicker than desaturation or diminished chest excursion
Patient Monitoring Practices

- Alarm Fatigue and Desensitization
- Trend Analysis Research Needed

“Will not replace Direct Nursing Observation and Assessment!”
Question

The most important predictor of respiratory depression in patients receiving IV opioid analgesics in the hospital setting is:

a. Respiratory rate
b. Patient reported pain intensity
c. Sedation level
d. Blood pressure
e. All of the above
Recommendations for Monitoring

- Institutional Policies and Procedures
  - Monitoring Practices
  - Serial Sedation and Respiratory Assessment
  - Sedation = Respiratory Depression
    - Increase frequency of assessment of both
  - Appropriate Sedation Scales for Unintended Sedation
  - Count respirations for full minute
  - Don’t transfer patients between levels of care near peak effects of medication
Recommendations for Monitoring

- Arouse Patient Immediately If:
  - < 8-10 breaths/min
  - Paradoxic rhythm with little chest excursion
  - Advancing Sedation
  - Poor Respiratory Effort/Quality
  - Snoring/Noisy Respirations
  - Desaturation
Recommendations for Monitoring

• More Vigilant Monitoring If:
  • Peak Medication Effects
  • During 1st 24 hours after Surgery
  • After Increase in Dose of Opioid Coinciding with Aggressive Titration of Opioids
  • Recent or Rapid Change in End-Organ Function (Hepatic, Renal or Pulmonary)
  • When moving from one opioid to another or route of administration
Questions and Examples
Contact Information

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540-981-8126
Guidelines on Monitoring for Opioid-Induced Sedation and Respiratory Depression
Approved June 2011

• http://www.aspmn.org/Organization/documents/GuidelinesonMonitoringforOpioid-InducedSedationandRespiratoryDepression.pdf