Opioid-Induced Sedation and Respiratory Depression: Evidence-Based Monitoring Guidelines

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RESPIRATORY DEPRESSION IS the most feared of the opioid adverse effects."¹,² Nurses in hospitals and all settings nationwide are challenged every day to prevent this life-threatening adverse effect. In 2011, the American Society for Pain Management Nursing (ASPMN) released evidence-based guidelines on monitoring for opioid-induced sedation and respiratory depression in patients receiving opioids for pain management in the acute care setting.³ The guidelines provide answers to frequently asked questions and may be useful in the development of hospital policies and procedures related to this important aspect of patient care. This article describes the development of the guidelines and provides its key recommendations with implications for nursing practice and the care of patients with pain.

Methodology of Guideline Development

The ASPMN guidelines were developed by an expert panel following a 3-year review of the literature on monitoring of opioid-induced sedation and respiratory depression (Medline, Pubmed, Cumulative Index to Nursing and Allied Health Literature, and Cochrane Library).³ After a preliminary review of the literature, the panel divided the large body of literature into four categories for a more extensive search, namely individual risk factors, iatrogenic risk factors, pharmacology, and monitoring. The American Society of Anesthesiologists evidence-rating system⁴ was used to grade the strength of the evidence. Recommendations for practice were compiled from scientific literature (eg, meta-analyses, systematic reviews, randomized controlled trials [RCTs], and quasi- and nonexperimental studies), state of the practice, published evidence-based guidelines, and consensus-based opinions of the ASPMN Expert Consensus Panel. The methodologies and policies from the American College of Cardiology Foundation and American Heart Association Task Force on Practice Guidelines⁵ were used to prioritize the strength and importance of the recommendations for practice (Table 1).

Definitions

The ASPMN Guidelines define individual risks as “factors that predispose a person to unintended opioid-induced advancing sedation and respiratory depression.”³ These factors are many and include age, physical characteristics, and comorbidities.

Iatrogenic risks are defined as “pain therapy-related variables, environmental factors, and circumstances in the hospital workplace that may predispose a patient to increased risk for unintended advancing sedation or respiratory depression.”³ These factors include methods of opioid administration, coadministration of other sedating agents, and nurse staffing and communication.

The Guidelines define pharmacology as “agents that are administered for the treatment of pain in the acute care setting.”³ Agents include opioids, nonopioids, antidepressants, anticonvulsants, clonidine, ketamine, and dexmedetomidine.

Monitoring is defined as “the practice of using nurse observations, including, but not limited to, the use of sedation assessment scales and technologies to collect serial measurements to anticipate and recognize advancing sedation or respiratory depression.”³ Nurse monitoring of sedation and

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respiration and mechanical monitoring of respiration, such as pulse oximetry and capnography, were reviewed.

Recommendations

The ASPMN Guidelines Expert Consensus Panel provided summary recommendation statements for each of the four subcategories and strategies for implementation of the recommendations (key recommendations in Table 2). The strategies describe the establishment of supportive policies and procedures; evaluation and improvement of documentation and interdisciplinary communication; tracking of outcomes; and nursing, prescriber, and patient education.

Summary

The ASPMN Guidelines on Monitoring for Opioid-induced Sedation and Respiratory Depression provide evidence-based recommendations for the care of patients receiving opioid analgesics for the treatment of pain in the acute care setting. They reflect the uniqueness of patients, autonomy in nurses’ judgments and decision making, and foundations of professional nursing practice. Identified limitations were the lack of RCTs examining outcomes associated with monitoring techniques and the lack of standardized well-defined outcomes across studies.

### Table 1. American College of Cardiology Foundation and American Heart Association Task Force on Practice Guidelines Methodology

<table>
<thead>
<tr>
<th>Class</th>
<th>Conditions</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>Class I</td>
<td>Conditions for which there is evidence and/or general agreement that a given procedure or treatment is useful and effective: benefit &gt;&gt; risk.</td>
<td></td>
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<tr>
<td>Class II</td>
<td>Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.</td>
<td></td>
</tr>
<tr>
<td>IIa</td>
<td>Weight of evidence/opinion is in favor of usefulness/efficacy: benefit &gt;&gt; risk.</td>
<td></td>
</tr>
<tr>
<td>IIb</td>
<td>Usefulness/efficacy is less well established by evidence/opinion: benefit ≥ risk.</td>
<td></td>
</tr>
<tr>
<td>Class III</td>
<td>Conditions for which there is evidence and/or general agreement that the procedure/treatment is not useful/effective and in some cases may be harmful: risk ≥ benefit.</td>
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</tbody>
</table>

*Based on data from reference 3.

respiration and mechanical monitoring of respiration, such as pulse oximetry and capnography, were reviewed.

### Table 2. Key Recommendation Statements

1. Comprehensive preadmission, admission, and preopioid therapy assessments are recommended to identify and document existing conditions, disease states, and other factors that may place patients at a risk of unintended advancing sedation and respiratory depression with opioid therapy (Class I).
   A. Risk factors may include but are not limited to age above 55 years, preexisting pulmonary disease, known or suspected sleep-disordered breathing problems, anatomical or airway abnormalities, and comorbidities (systemic disease, renal, or hepatic impairment) or presurgical or preprocedural ASA status higher than 2.6
   B. Preoperative ASA Physical Status Classification System category status assigned by the anesthesia provider is an important factor in determining level of care after surgery.
   C. Interpretation of evidence-based assessment criteria/tools can be useful in determining patient risk status (eg, results of sleep studies, history of witnessed apneas, and screening with the STOP-Bang questionnaire).
   D. Develop medical record forms that include risk assessment criteria and/or information to facilitate documentation.

2. Nurses should communicate all pertinent information regarding patients’ risks during shift report and across all transitions in care from prehospitalization to discharge to ensure that health care providers are informed of potential risks (Class I).

3. It is reasonable that organizations develop and implement polices and procedures that define the scope of patient risk assessment practices, requirements for documentation, standards of care, and accountability of health care providers for ensuring safe patient care with opioid therapy (Class IIa).

(Continued)
4. Information obtained from patient assessment and available clinical information should be used to formulate individualized plans of care for the level, frequency, and intensity of patient monitoring of sedation and respiratory status during opioid therapy (Class I).

5. Mechanisms for oversight and surveillance of practice outcomes with patient risk assessment can be effective methods to ensure safe and optimal care of patients receiving opioid therapy (Class IIa).

Iatrogenic risk

1. Iatrogenic risk assessment and other patient risk factors should be considered when determining the intensity and frequency of monitoring for patients receiving opioid analgesia (Class I).

2. The duration and intensity of monitoring should be continually reevaluated based on potential/actual iatrogenic risks and assessments of response to therapy (Class II).

3. The use of technology does not replace the need for systematic nursing assessment and should not diminish staffing levels (Class III).

4. Policies and procedures and guidelines are recommended to facilitate accurate and complete hand-off communication among all health care professionals during shift report and transitions of care (Class IIa).

5. Institutions are encouraged to establish procedures to ensure the availability and consistency of a rapid response to opioid-induced respiratory emergencies 24 h a day, 7 days a week (Class IIa).

6. Quality improvement or performance methodologies, such as root cause analysis, peer reviews, and mortality and morbidity conferences, are reasonable approaches to examining sentinel or serious potential/actual events (Class IIa).

Pharmacology

1. Nurses should act as strong advocates for pain management plans that incorporate opioid dose-sparing strategies initiated early in the course of treatment, for example, on admission, before surgery, during surgery, and early after surgery (Class I).

2. Observation and assessment of sedation and respiratory status regardless of the type of opioid administered is recommended (Class I).

3. Observation and assessment of sedation and respiratory depression are still necessary when acetaminophen and nonsteroidal antiinflammatory drugs are administered concomitantly despite evidence that these may have opioid dose-sparing effects (Class IIa).

4. More intensive and frequent observation of patients and assessment of sedation and respiratory status are recommended when sedating agents are administered concomitantly, especially during the postoperative period (Class I).

5. All nurses caring for patients receiving opioid therapy should be educated about patient and pharmacologic factors contributing to increased risk for unintended advancing sedation and respiratory depression and parameters and criteria for identifying sedation and respiratory concerns (Class I).

6. Educational programs should include content on the mechanisms of action, pharmacodynamics/pharmacokinetics, and adverse effects of the various doses and routes of administration for analgesics, including patient factors and practices that place patients at risk for excessive sedation and respiratory depression. Content should be updated regularly to include new pharmacologic agents and practices (Class IIa).

Monitoring

1. The frequency, intensity, duration, and nature of monitoring (assessments of sedation levels and respiratory status and technology-supported monitoring) should be individualized based on a patient’s individual risk factors, iatrogenic risks, and pharmacologic regimen administered to treat pain (Class I).

2. It is generally recommended that monitoring practices for patients receiving opioid therapy be defined by institutional policies and procedures that are aligned with published evidence-based guidelines and expert opinion (Class IIa).

3. Serial sedation and respiratory assessments are recommended to evaluate patient response during opioid therapy by any route of administration (Class I).

A. Include regular sedation and respiratory assessments during wakefulness and sleep as part of care to evaluate patient outcomes with requirements for documentation.

(Continued)
Table 2. Continued

B. Sedation scales with acceptable measures of reliability and validity for pain management outside of purposeful sedation and anesthesia and critical care should be selected.

C. Be aware that unintended advancing sedation from opioids is often a sign that the patient may be at higher risk for respiratory depression, suggesting the need for increased frequency of assessment of sedation levels and respiratory status.

D. Respirations should be counted for a full minute and qualified according to rhythm and depth of chest excursion while the patient is in a restful/sleep state in a quiet unstimulated environment.

E. Patients should not be transferred between levels of care near peak effect of medication.

4. Patients found to have signs of respiratory depression, evidence of advancing sedation, poor respiratory effort or quality, snoring or other noisy respiration, or desaturation should be aroused immediately and instructed to take deep breaths. Intervene and communicate with other team members per practice policy and continue patient monitoring until patient recovers (Class I).

5. Technology-supported monitoring (eg, continuous pulse oximetry and capnography) can be effective for the patient at high risk for unintended advancing sedation and respiratory depression (Class IIa).

6. More vigilant monitoring of sedation and respiratory status should be performed when patients may be at greater risk for adverse events, such as at peak medication effect, during the first 24 h after surgery, after an increase in the dose of an opioid, coinciding with aggressive titration of opioids, recent or rapid change in end-organ function (specifically hepatic, renal, and/or pulmonary) or when moving from one opioid to another or one route of administration to another (Class I).

*Based on data from reference 3.

References


