

Dangers of postoperative opioids: Is there a cure?

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Editor's note: *The following article originally appeared in the Summer 2009 issue of the Anesthesia Patient Safety Foundation (APSF) Newsletter. Surgeons are a critical link in this safety issue, as patient-controlled analgesia is often ordered and supervised by the surgeon. Reprinted with permission.*

On October 13, 2006, the APSF conducted a workshop in response to concerns about the safety of the use of patient-controlled analgesia (PCA) in the postoperative period.* The workshop focused on improved detection of postoperative opioid-induced respiratory depression. A number of clinical observations and recommendations resulted, including the following:

- Even though current methods for detecting and preventing opioid-induced respiratory depression have limitations, APSF believes that

*Weinger, MB. Dangers of postoperative opioids: APSF workshop and white paper address prevention of postoperative respiratory complications. *APSF Newsletter*, Winter 2006-2007;21:61-67.

continuous monitoring using available technologies could still prevent a significant number of cases of patient harm.

- Thus, the APSF urges health care professionals to consider the potential safety value of continuous monitoring of oxygenation (pulse oximetry) and ventilation in patients receiving PCA or neuraxial opioids in the postoperative period.

- Although pulse oximetry will monitor oxygenation during PCA, it may have reduced sensitivity, as a monitor of hypoventilation, when supplemental oxygen is administered. When supplemental oxygen is indicated, monitoring of ventilation may warrant the use of technology designed to assess breathing or estimate arterial carbon dioxide concentrations. Continuous monitoring is most important for the highest risk patients, but depending on clinical judgment, should be applied to other patients.

We believe that unexpected and potentially harmful opioid-induced respiratory depression continues to occur. In most cases, there is inadequate monitoring (as described previously) of

oxygenation and/or especially ventilation, as well as a failure to consider unique characteristics of the patient's history and physical status that place them at higher risk for respiratory depression from opioid analgesics.

Standardized protocols for PCA or neuraxial opioids may promote a "one size fits all" approach to pain management without sufficient consideration of individual patient characteristics and medical conditions. Continuous pulse oximetry is not being routinely employed. More commonly respiratory monitoring relies on nurses' periodic observation and documentation of breathing or respiratory rate. Even when continuous pulse oximetry is utilized, supplemental oxygen may be administered, sometimes without confirming its necessity, or appreciating its potential to mask progressive hypoventilation.

It is critically important to emphasize the need to individualize postoperative pain management (opioid dose and infusion rate are not the same for every patient) and to insist that continuous monitoring of oxygenation (pulse oximetry) be the routine and not the exception. The use of supplemental oxygen must be justified. Finally, during PCA or neuraxial opioid therapy, intermittent subjective assessments of ventilation or level of consciousness are unreliable predictors of *future* respiratory depression even over short time frames (10 to 15 minutes).

We recommend consideration of the use of technology to continuously monitor ventilation in all patients receiving postoperative PCA or neuraxial opioid pain management. Where appropriate, this should be a routine component of postoperative care for patients known to be at high risk for opioid-induced respiratory depression (existing depressed level of consciousness or respiratory impairment, sleep apnea, or the very sick or elderly). Even if ventilation assessments are performed intermittently during routine nursing observations, the use of respiratory monitoring technology (capnometry) would improve the detection of progressive or unrecognized hypoventilation.


In summary, we believe that every patient receiving postoperative opioid analgesics should be managed based on the following clinical considerations:

- Individualize the dose and infusion rate of

opioid while considering the unique aspects of each patient's history and physical status

- Make continuous monitoring of oxygenation (pulse oximetry) the routine rather than the exception
- Assess the need for supplemental oxygen, especially if pulse oximetry or intermittent nurse assessment are the only methods of identifying progressive hypoventilation
- Consider monitoring ventilation (even if intermittent) with technology capable of detecting progressive hypoventilation

Unrecognized postoperative opioid-induced respiratory depression can be reliably detected only if an understanding of the pathophysiology of the sequence of events and available monitoring technology are considered in all patients.

For more information, visit <http://www.apsf.org>. 

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