Preventing complications in patients receiving opioids

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Do you know what *opioid-naïve* means? What about *opioid-tolerant*? If you don't know the definitions of these terms, you need to learn them—because a patient's history of opioid use (or lack thereof) has important implications for nursing care. (See the box below.) This article defines these terms, describes the dangers of oversedation (especially in opioid-naïve patients), and tells how to assess patients receiving opioids.

Defining opioid-tolerant and opioid-naïve

According to the Food and Drug Administration, a patient is considered *opioid-tolerant* if he or she has received at least the following for 1 week or longer:

- 60 mg oral morphine/day
- 25 mcg transdermal fentanyl/hour
- 30 mg oral oxycodone/day
- 8 mg oral hydromorphone/day
- 25 mg oral oxymorphone/day
- an equianalgesic dose of another opioid.

Patients who don't meet these criteria and haven't received opioid doses at least as much as those listed above for 1 week or longer are deemed *opioid naïve*.

The National Comprehensive Cancer Network provides these definitions of the two terms:

- *Opioid naïve*: patients not chronically receiving opioid analgesics on a daily basis
- *Opioid tolerant*: patients chronically receiving opioid analgesics on a daily basis.

To determine the level of opioid tolerance, the nurse conducting the admission assessment should ask patients if they've ever received an opioid. Opioid-naïve patients are at higher risk for oversedation and aspiration, especially if they receive opioids in inappropriate dosages. Complications also may arise when a patient resumes a general diet too soon, especially if he or she is still experiencing extreme nausea. In this scenario, the patient may vomit while oversedated, fall asleep and aspirate the vomitus, and possibly die.

Identifying high-risk patients

Risk factors for oversedation and respiratory depression include:

- lack of recent opioid use
- higher opioid dosage requirement or opioid habituation
- sleep apnea
- sleep disorders
- pulmonary disorders

- morbid obesity with an associated high risk of sleep apnea
- history of snoring
- history of smoking
- age older than 60 (the risk is 2.8 times greater from ages 61 to 70, 5.4 times greater from ages 71 to 80, and 8.7 greater times after age 80)
- postoperative status (particularly after upper abdominal or thoracic surgery)
- use of benzodiazepines, antihistamines, diphenhydramine, sedatives, or other central nervous depressants.

Hydromorphone vs. morphine

Many clinicians confuse hydromorphone with morphine because the names are similar. Although hydromorphone is a morphine derivative, it's much more potent than morphine. The estimated relative potency of hydromorphone to morphine is 7.5:1. (See the box below.)

What you need to know about hydromorphone

In recent years, you may have noticed more frequent prescriptions for hydromorphone (Dilaudid). That's at least partly because meperidine (Demerol) was removed from many formularies several years ago when a toxic metabolite was found to cause significant untoward effects. As a result, meperidine is no longer considered a first-line analgesic and has been replaced largely by hydromorphone.

In many acute-care settings, hydromorphone and morphine are being prescribed regularly as drugs of choice for pain management. But many clinicians aren't familiar with hydromorphone or the recommended starting dose for opioid-naïve patients. (In fact, some think the starting dose is the same for all opioids.) Some clinicians are mistakenly—and dangerously—prescribing hydromorphone at starting doses typically used for morphine. This has caused a rise in overdoses in acute-care settings. Lack of knowledge about hydromorphone potency and potency difference between morphine and hydromorphone has led to serious medication errors, especially when a patient is switched from morphine to hydromorphone.

The Pennsylvania Patient Safety Advisory of 2010 and other agencies have noted inconsistencies in recommendations for the appropriate starting dose and frequency of hydromorphone administration. Until 2011, the product label stated that the initial I.V. dose for opioid-naïve patients was 1 to 2 mg (given slowly) every 4 to 6 hours, as needed. However, some of the literature recommended *against* using 2 mg I.V. as a starting dose even in nonelderly patients. In one study, one-third of adult nonelderly patients who'd received 2 mg of hydromorphone were taken to emergency departments complaining of acute, severe pain and developed oxygen desaturation.

In 2011, the Food and Drug Administration approved revisions to the prescribing information, container labels, and carton labeling for Dilaudid (the proprietary form of hydromorphone). The I.V. starting dose was reduced to 0.2 to 1 mg. Also, a revised bolded warning was added at the front of the prescribing information to warn clinicians that hydromorphone and morphine are not milligram-to-milligram equivalents and to use the appropriate conversion table to convert doses from other opioids to Dilaudid.

Monitoring patients receiving opioids

Routine monitoring of vital signs may fail to detect early signs of respiratory depression. Many nurses focus on pulse oximetry, blood pressure, and respiratory rate when assessing a patient for opioid-related oversedation. But pulse oximetry also may not provide accurate information, especially in a patient receiving oxygen. Also, bradypnea is a poor predictor of oxygen desaturation and occur late in respiratory depression—or not at all. In opioid-naïve patients, respiratory rate is a notoriously poor predictor of respiratory depression; it may be normal despite significant hypoventilation. Also be aware that the patient's respiratory status may change rapidly, and these changes may elude conventional monitoring techniques used in most settings today.

Detecting hypercapnia

The most commonly monitored parameters of respiratory function are respiratory rate and oxygen saturation (SaO_2). Yet significant hypercapnia may arise before oxygen desaturation occurs.
After a patient's pain has been relieved, he or she may fall asleep and slip into respiratory depression and apnea.

Be sure to assess for signs of early hypercapnia—flushed skin, a full pulse, tachypnea, dyspnea, muscle twitches, hand flaps, reduced neural activity, and possibly increased blood pressure. Signs and symptoms of mild hypercapnia may include headache, confusion, and lethargy. For high-risk patients, capnography is recommended.

Checking the arousal level

Your patient's arousal level may give a false sense of security. Respiratory depression may occur even with a reasonably normal arousal level. After arousal, patients on opioids may appear to be breathing at a normal rate and able to respond appropriately to questions—yet may be oversedated. So if the patient appears to be sleeping or resting comfortably, be sure to check arousability. (But don't check it from the hallway by peeking into the patient's room. This isn't an acceptable standard of care. Go into the room and perform the assessment.)

Post-anesthesia recovery units have a standardized sedation scale clinicians for assessing sedation depth and arousability and determine if intervention is needed. Med-surg units should use a similar scale for patients receiving opioids. (See the box below.)

Pasero Opioid-Induced Sedation Scale

S = Sleep, easy to arouse

Acceptable: No action necessary; supplemental opioid may be given if needed.

1 = Awake and alert

Acceptable: No action necessary; supplemental opioid may be given if needed.

2 = Slightly drowsy, easily aroused

3 = Frequently drowsy, arousable, drifts off to sleep during conversation

Unacceptable: Decrease opioid dosage by 25% to 50%. Administer acetaminophen or an NSAID, if not contraindicated, to control pain. Monitor sedation and respiratory status closely until sedation level is less than 3.

4 = Somnolent, minimal or no response to physical stimulation

Unacceptable: Stop opioid. Notify anesthesia provider; very slowly administer diluted I.V. naloxone (0.4 mg naloxone in 10 mL saline; 0.5 mL over 2-minute period); administer acetaminophen or an NSAID, if not contraindicated, to control pain.Monitor sedation and respiratory status closely until sedation level is less than 3.

Source: Pasero C, Portenoy RK, McCaffery M. Opioid analgesics. In: McCaffery M, Pasero C. (Eds). *Pain: Clinical Manual*. 2nd ed. St. Louis, MO: Mosby; 1999. Reprinted with permission.

Ideally, you should observe the patient *before* attempting arousal, and compare the current mental status and vital signs against baseline (preadmission) findings.

Preventing aspiration

Patients who are sedated from opioids may experience nausea and vomiting after eating and then suffer aspiration. To prevent this, don't give patients solid foods until they can tolerate clear liquids and nausea and vomiting have subsided.

Questioning opioid orders

Of the opioid-related adverse drug events (including deaths) in hospitals that were reported to The Joint Commission's Sentinel Event database from 2004 to 2011, 47% were wrong-dose errors, 29% stemmed from improper patient monitoring, and 11% were related to other factors, including excessive dosing. The Joint Commission's standard for medication management of orders state that orders must be clear and accurate. If a prescriber's order doesn't look familiar, question it. Remember that as a nurse, you're accountable for safe practice, following hospital policy, and using critical thinking skills when taking orders that are outside recommended parameters.

Monitor closely, document promptly

To help ensure patient safety, closely monitor the patient's response to opioids. Check for adverse effects, and document these promptly and accurately. Delaying your documentation until after your shift ends can put you in legal jeopardy if a bad outcome occurs and the case is litigated.

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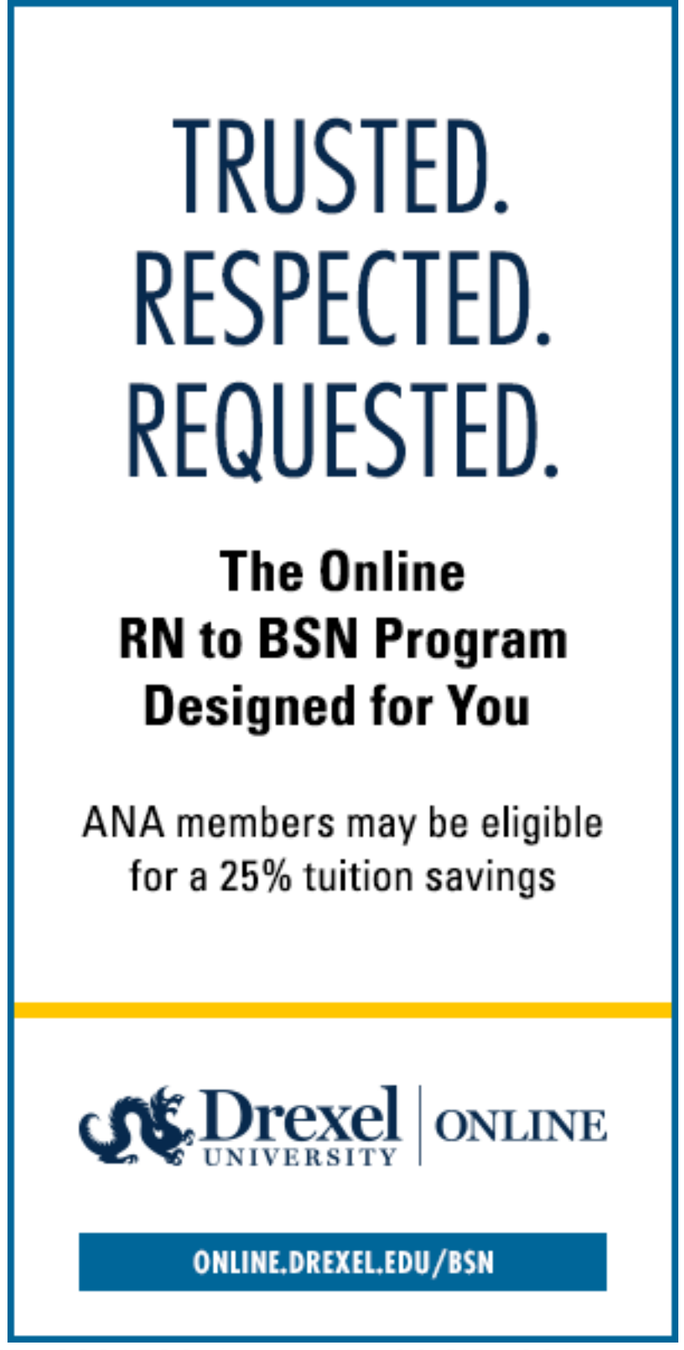

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- **a. Treatment includes slow-acting antihypertensive agents.**
- **b. The most common cause is increased urine output.**
- **c. Injuries at the T2 level and higher involve the splanchnic vascular bed, which leads to increased blood pressure (BP).**

d. A stimulus activates the spinal reflex mechanism, causing vasoconstriction below the injury level, which in turn raises BP.

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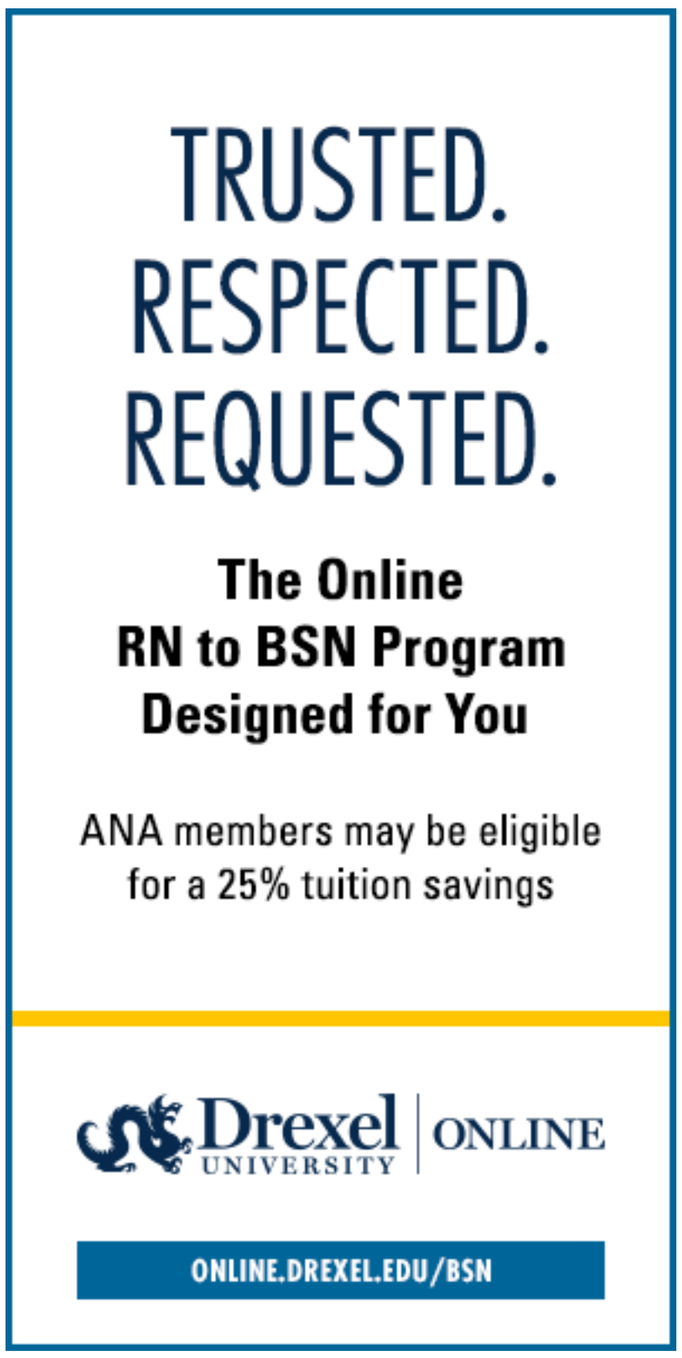

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