Patient safety and opioid medications

Hospitalised patients often require appropriate pain relief as part of their treatment. Opioids are effective medications for pain management, but can cause excessive sedation and respiratory depression resulting in patient harm. Dr Carla Jungquist of the University at Buffalo, School of Nursing, and a panel of fellow experts reviewed evidence from the past decade to provide an important update on the prevention of patient harm when using opioid medications for acute pain management. The information in this article will inform patients and their loved ones how to advocate for safe and effective pain management.

Fifty percent of patients that are hospitalised will receive opioid medications to control acute pain. Six out of every 1,000 postoperative patient receiving opioids will experience a serious adverse event (Herzig, et al, 2014). One class of pain relief medication is the opioids, which include such medications as codeine, oxycodeone, hydrocodone, buprenorphine, fentanyl, morphine and methadone. Whilst effective in relieving pain, opioids can also have undesired and potentially dangerous side effects. In 2011, the American Society for Pain Management Nursing published guidelines on monitoring hospitalised patients for opioid-induced respiratory depression. In 2019, a panel of 14 experts convened to review scientific evidence from the last decade to provide the following up-to-date revisions to these guidelines.

OPIOID-INDUCED RESPIRATORY DEPRESSION (OIRD) Patients should communicate the patient’s level of risk to the healthcare team to ensure patient safety. Before starting opioid and other sedating medications, the patient’s level of risk should be assessed. Risk should be reassessed throughout the patient’s treatment. Electronic health records (EHR) could facilitate this by providing a checklist for clinicians to follow during assessment, or by an alert system whenever a patient requires frequent opioid dosing, when other potentially sedative medications are given in addition to opioids, or when different formulations of opioids are used (for example, swapping from a long-acting to a short-acting medication).

INDIVIDUAL PATIENT RISK FACTORS There are certain characteristics and medical conditions that increase the patient’s risk of developing respiratory depression from opioid medications. Higher risk characteristics include obstructive sleep apnea, obesity hypoventilation disorder, undernourished or obese (BMI less than 20 or more than 35), impaired kidney, liver, heart, or lung function, and/or age greater than 60 years.

Opioid drugs act on receptors in the central nervous system to block the transmission of pain. Nonsteroidal anti-inflammatory medications are also opioid-sparing, however can have side effects such as increased risk of bleeding and kidney failure, so individual patients should be assessed for these risks prior to use. Anticonvulsant medications (including gabapentin and pregabalin) may cause increased sedation but do reduce the amount of opioid required and are not associated with opioid-induced adverse events. Antidepressants may be used in the treatment of chronic pain, and may cause increased drowsiness if combined with opioids.

Clonidine is another drug used to treat pain which may offer opioid-sparing effects, although it may also cause increased sedation when used with opioids.

HOW TO AVOID PATIENT HARM – ASSESS, COMMUNICATE LEVEL OF RISK It is the responsibility of the healthcare team to ensure patient safety. Before starting opioid and other sedating medications, the patient’s level of risk should be assessed. Risk should be reassessed throughout the patient’s treatment. Electronic health records (EHR) could facilitate this by providing a checklist for clinicians to follow during assessment, or by an alert system whenever a patient requires frequent opioid dosing, when other potentially sedative medications are given in addition to opioids, or when different formulations of opioids are used (for example, swapping from a long-acting to a short-acting medication).

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Functional Pain Scale (FPS)

**Suggested FPS for Hospital Use**

- No pain
- Slightly uncomfortable
- Moderately uncomfortable
- Intolerable: Unable to communicate pain

Tolerable: Able to perform all activities

Intolerable: Unable to perform all activities

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Functional Pain Assessment

Evidence suggests that the use of a 0–10 scale increases the risk of respiratory depression. It is associated with many side effects even at low doses, including delirium, agitation, hallucinations and sedation.

How to Avoid Patient Harm – Monitoring Respiratory Status

The nature, timing, frequency and intensity of patient monitoring of breathing should be based on level of risk. Patients should be reassessed throughout their treatment for any change in their risk levels and their response to pain treatments and care plan adjusted accordingly.

Specifically, during the first 24 hours after surgery or starting opioid medications, a patient’s response to pain medications should be assessed by a nurse before administering an opioid medication, at the time when the opioid medication is at peak effect, and every two hours with intermittent assessments or continuous using electronic respiratory monitoring. The nursing assessment should include oxygen saturation, respiratory rate and quality of breath, and level of sedation as well as pain level. The goal for pain management should be related to functional tasks.

Education and Policies

Clinicians should be educated on best practices for evaluating patient risk for OIUA and OIRD, assessing sedation level and respiratory status, use of trend monitoring, appropriate use of positive airway pressure therapy, and early interventions if adverse events occur. Hospitals can improve patient safety by developing policies that focus on clinician, patient and family education on risks and monitoring procedures.

Patient care plans should be based on the individual’s level of risk, which may change over their hospitalisation period.

Ketamine is an anaesthetic medication which can be used at low doses for pain relief. Evidence exists to support the use of ketamine at low doses to reduce opioid requirements without increasing the risk of respiratory depression. It is also associated with many side effects even at low doses, including delirium, agitation, hallucinations and sedation.

How to Avoid Patient Harm – Functional Pain Assessment

Traditionally, patients are asked to rate their level of pain using a 0–10 scale. Over the years, it has been found that using a 0–10 scale increases the likelihood of overlooking the patient. More recent research has shown that using a functional pain scale that assesses the patient’s ability to perform necessary movements and tasks reduces the risk of overdosing with opioids. Medications of an example includes a functional pain assessment. As an example for a hospitalised patient, the goal of treatment should be related to tasks such as deep breathing, ambulating in the hall, rolling over in bed, attending physical therapy, and/or conversing with visitors.

The type of electronic monitoring used should depend on the patient, for example the presence of supplemental oxygen, their comfort and adherence to the monitoring device, and the capability of the device itself. Devices used include pulse oximetry (to measure oxygen saturation), the acoustic respiratory rate monitor, capnography (to measure carbon dioxide levels in the airways when exhaling), and the minute ventilation monitor (to measure the volume of air inhaled or exhaled per minute). Patients should be monitored for trends (change over time) in variables (such as respiratory rate, sedation level and ventilation parameters from electronic devices) to evaluate improvement, stability or worsening of any values. This can facilitate early detection of OIUA and OIRD and therefore timely intervention when required.

Hospital policies should ensure that all members of the patient care team are effectively communicating with each other, especially at shift changes or transitions of care, to reduce the risk of opioid related adverse events. Having an appropriate ratio of staff to patients can also increase patient safety. Hourly rounding by nursing staff should include a brief observation of patient safety, breathing, and pain control.

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Whilst patients at risk of OIUA and OIRD should be evaluated for continuous electronic monitoring, this should not be a replacement for regular assessments by a nurse. Continuous electronic monitoring of many patients at one time may lead to alarm fatigue, where members of staff become desensitized to frequent alerts, rendering them less effective and impacting patient safety.

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Research Objectives

Dr Carla Jungquist’s research promotes safe and effective pain management. Specifically, she explores the interdependent relationship between pain, sleep and opioids.