Equianalgesia: Applying Evidence-Based Practice Guidelines

Bruce S. Bond, PharmD

Pain related to cancer affects the lives of large numbers of patients and their families. Cancer pain takes many forms: It may be short-lived or long-lasting, may be mild or severe, may affect one or a few organs, bones, or organ systems. Each patient’s pain is unique; therefore, a greater understanding of pain management and pain relief is essential for oncology nurses.

The term “equianalgesia” means “approximately equal analgesia” and is used when referring to the doses of various opioid analgesics that provide approximately the same pain relief (Pereira, Lawlor, Vigrano, Dorgan, & Bruera, 2001). Equianalgesic dose calculations provide a basis for selecting the appropriate starting dose when changing from one opioid drug or route of administration to another. Equianalgesia is critical to effective cancer pain management (Beach, 2008). When patients are no longer able to manage their pain with oral opioids, alternative routes must be explored. Sterman, Gauker, and Krieger (2003) reported that semiweekly pain management rounds with a clinical pharmacist provided the opportunity for nurses to practice equianalgesic dosing and to make recommendations for changes in pain management.

Evidence Supporting Equianalgesia

A meta-analysis of the research literature appraised the emerging evidence on equianalgesic dose ratios derived from studies of opioid administration. Pereira et al. (2001) reported that (a) a general paucity of data exists related to long-term opioid dosing, and studies are heterogeneous in nature; (b) recommended dosages exhibit extremely wide ranges; (c) methadone is more potent than previously reported; (d) ratios related to methadone are highly correlated with the dose of the previous opioid; (e) the ratio may change according to the direction of the opioid switch; and (f) discrepancies exist with respect to the appropriate dosages of oxycodone and fentanyl.

According to the National Comprehensive Cancer Network ([NCCN], 2007), dosing equivalents should be individualized. The correct dose is the dose that relieves the patient’s pain without causing unmanageable side effects (NCCN). To determine when dose escalation is warranted, healthcare professionals should consider the patient’s reported pain score, severity of symptoms, and total opioid dose for the previous 24 hours (NCCN). A comprehensive table of oral and parenteral dose equivalents is available in the most recent edition of the NCCN pain management guidelines.

Application to Nursing

Relief of suffering is a nursing goal that is shared with patients. Despite the common goal, the problem of inadequate pain control exists on a large scale (NCCN, 2007). Nurses have a unique role because of their close working relationships with patients. Their ability to fine-tune analgesia rests on a number of foundations, including close contact with patients, pain assessment skills, their knowledge of practice, degree of empowerment, and the wider goals and structure of the nursing care environment.

Ongoing, diligent patient assessment is the most important step in the equianalgesic conversion process. Conversion must take into account individual patient characteristics such as age, renal function, side effects, and pain syndrome. In addition, if an opioid dose is not adequate to begin with, the conversion dose is less likely to be effective. Assessment should be aimed at preventing pain if possible, identifying it immediately should it occur, and then monitoring it as interventions are selected and implemented. Believe the patient. The patient’s self-report should be the primary source of pain assessment. Even when their pain recall is unreliable, patients with mild to moderate cognitive impairment (Kurita & de Mattos Dimenta, 2008) are able to report pain reliably at the moment or when prompted. Chart and assess pain with easily administered rating scales (e.g., 0–10 pain scale, Wong-Baker face scale) and document the efficacy of pain relief at regular intervals, including after starting or changing treatment, as well as with any new report of pain or change in pain pattern. Patients and caregivers should be taught how to use the pain rating scales.

Unrelieved pain has detrimental effects on wound healing, with subsequent pain chronicity (Shukla et al., 2005). Tissue damage and inflammation sensitize nerve....

Digital Object Identifier: 10.1188/08.CJON.527-529
endings that transmit nerve signals. Repeated stimulation can cause benign sensations to become painful. Clinicians must adopt a rational therapeutic approach to pain management to help relieve pain, facilitate wound healing, and minimize the risk of chronic wound pain. The implementation of semiweekly pain management rounds with a clinical pharmacist can promote effective pain management, thereby enhancing wound healing (Loitman et al., 2007).

Ensuring Adequate Pain Relief

According to pain management principles, the oral route of administration is preferred; barring contraindications, morphine sulfate is always the drug of choice if an opioid medication is needed (Benedetti, Dickerson, Cox, Ripamonti, & Davis, 2002). However, medication and/or route of administration may have to be changed. When converting one opioid substance to another or when changing an opioid's route of administration, clinicians often use an equianalgesic conversion table as a mathematical guide. The traditional equianalgesic table was based on well-designed, controlled comparisons of opioids administered in single doses to healthy volunteers or to patients with acute pain, but it is increasingly used for patients receiving chronic opioid therapy. An understanding of equianalgesia conversion is essential to ensure that patients are not over- or underdosed. Table 1 and Figure 1 demonstrate appropriate conversion of the same medication to a different route.

Suppose a patient is stable on morphine sulfate 10 mg via IV every four hours. To convert to an oral dose for home use, the proper order would be morphine sulfate 30 mg PO every four hours. This is because most opioids undergo first-pass metabolism, meaning a portion of the dose is absorbed and metabolized by the liver, so the patient does not get any benefit from that portion of the dose (Anderson, Saisers, Abram, & Schlicht, 2001).

Consider another example. Suppose a patient was started on extended-release morphine 30 mg PO every 12 hours. Several hours after the first dose of the drug is administered, the nurse notices that the previously cognizant patient has become delusional and is hallucinating, stating, “There are ants in my bed.” Before calling the doctor to report the symptoms, the nurse talks with the clinical pharmacist, who suggests that an alternative second-line drug might be methadone because of its lack of known metabolites, high oral bioavailability, rapid onset and time to peak analgesic effect, and long duration of activity, which allows for longer intervals between doses (D’Arcy, 2007). However, because methadone has a longer unpredictable half-life, the equianalgesic dose would be 20 mg every 12 hours (McCaulley, 2005).

Patient-controlled analgesia (PCA) pumps can be effective for short-term use and sometimes for long durations of therapy, but they are effective only if the appropriate amount of medication is prescribed to meet the patient’s needs. When PCA therapy is ineffective, the usual cause is an inappropriate regimen.
of the medication, not the mode of delivery. Opioids may be administered orally, via IV push, via PCA, subcutaneously, intrathecally, or epidurally. However, none of these routes is effective if the medication dosage is inappropriately prescribed.

**Conclusion**

For oncology nurses, understanding equivalent opioid doses is essential. The correct dose of the appropriate analgesic, rather than the route, is critical to managing patients’ pain. Working with the clinical pharmacist and physician to ensure adequate dosing will provide optimal pain management for patients with cancer. In addition to a hospital or clinical pharmacist, electronic references available to assist nurses include the NCCN (2007) Clinical Practice Guidelines in Oncology™ and the Clinician’s Ultimate Reference Narcotic Analgesic Converter (www.globalrph.com/narcoticonv.htm).

**Author Contact:** Bruce S. Bond, PharmD, can be reached at bruce.bond@ololmc.com, with copy to editor at CJONEditor@ons.org

**References**


