

## An Oral PCA Device for Breakthrough Pain in Oncology Patients

a report by

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Fifty per cent of all cancer patients and 90% of advanced cancer patients experience pain.<sup>1</sup> In addition to constant baseline pain most patients also experience breakthrough pain, which may be described as an exacerbation of the underlying pain.<sup>2</sup> The standard of pain management in these patients has been the administration of an around-the-clock slow-release opioid, combined with an immediate release opioid for breakthrough pain.<sup>3</sup>

Patients at home are able to manage their breakthrough pain with their immediate release opioid since they can freely access their medication without delay using the parameters set forth by their managing physician. Many cancer patients experience multiple hospitalizations throughout the duration of their treatment. When patients are admitted to the hospital they are not able to obtain their breakthrough pain medication on time since it is usually ordered, *pro re nata* (prn), by the physician. The delivery of a prn medication on average has been reported to take 18.4 minutes.<sup>4</sup> In reality this is rarely accomplished. In today's busy hospitals, with nursing shortages and complex patient care, the delivery of prn pain medications is usually delayed. A frequent complaint from hospitalized patients is their inability to access their breakthrough pain medications on time, in order to keep their pain under adequate control.<sup>5</sup>

Patient controlled analgesia (PCA) began in the early 1970s with intravenous (IV) devices for post-operative pain. Multiple routes of PCA administration are now available, such as IV, epidural, intrathecal, transdermal, and subcutaneous.<sup>6</sup> The need for an oral PCA device has long been recognized with multiple solutions reported by various facilities. One approach has been to schedule breakthrough pain medication at regular intervals and allow patients the right to refuse a dose if it is not yet needed for pain.<sup>7</sup> Although this may improve the management of breakthrough pain, it does not relieve the nurse from multiple visits to the patient's room for the delivery of each medication, which may or may not be needed at that time. A simple oral PCA approach has been the provision of a velcro wrist pouch containing two

doses of prn pain medication for responsible patients.<sup>8</sup> Another option has been a bedside vial with one dose of medication to be used as needed<sup>9</sup> and the patient required to contact the nurse for each refill. Although better than the status quo these approaches deliver only one or two doses of medication and patients must keep written records of their use. The Medication On Demand (MOD<sup>®</sup>) device is a simple-to-use oral PCA device able to deliver eight doses of medication at the patient's bedside using radio frequency identification (RFID) technology.

The MOD locks to an IV pole at the patient's bedside, allowing patients the ability to obtain their breakthrough pain medication without delay after the prescribed lockout time interval has passed, as specified by their treating physician. The device has a disposable medication tray containing eight doses of the medication. Once the physician has written an order for a prn oral pain pill or capsule to be dispensed by the device, the hospital pharmacy will dispense the filled and covered disposable tray to the patient's unit to be loaded into the device. The nurse will verify the proper medication, dose, time lockout and route of delivery of all eight doses at one time prior to loading the tray into the device. The device is programmed by the nurse using a wireless connection to either a laptop computer or personal digital assistant (PDA) containing a user-friendly software program. The program also links the patient's identification to an RFID tagged wristband that is placed on the patient for accessing the device. The nurse will also program an RFID smart card that will allow nursing access for programming and obtaining patient information from the device.

When the green ready light located on the front of the device comes on, the patient knows that the lockout time interval has passed and that a dose of medication can be obtained. In order to receive a dose of medication, the patient touches the 0–10 pain scale on the front of the device to record their level of pain. This in turn relays a signal that activates the RFID reader within the device. The patient swipes his/her RFID wristband over the front of the

device. The reader then recognizes the patient's wristband and causes the medication tray to turn and expose a single dose of medication that can be removed from the device.

The device software retains, in memory, the time each medication dose is removed by the patient and the time that any other event occurs, such as a tray change or an override 'now' dose dispensed by the nurse from the device. Since the patient records his/her level of pain prior to each dose of medication, this is also retained in memory. The nurse can query the device, at his/her convenience, in order to obtain the pain score for each dose, as well as the time of administration of each dose of pain medication. This information can then be documented into the electronic medical record.

A recent clinical trial of the device has been completed with 20 oncology patients in a large community hospital in-patient oncology unit.<sup>10</sup> Patients used the device for a minimum of 48 hours for prn pain pills or capsules per the physician's order. Patients, nurses and pharmacists were surveyed regarding their experience with using the device. Four patient questions were related to their ease-of-use of the device. Answers ranged 80–100% agree or highly agree that the device was easy to use. Ninety-five per cent reported that their pain was better controlled using the device and 100% answered that they preferred to use this device rather than call the nurse for each dose of pain medication. One hundred per cent stated that if they returned to the hospital in

the future they would like to use this device for the delivery of their oral pain medication.

Among the nursing surveys in the clinical trial, 84% of the nurses stated that the device saved them nursing time. Ninety per cent reported that they would like to use the MOD in the future for patients who were capable of using the device for pain management with oral medications. The conclusion of the clinical trial was that the device has been demonstrated to be a useful tool for oncology in-patients.

Some cancer patients and most post-operative patients are managed by an IV PCA to treat their breakthrough pain. Patients initially managed with IV PCA or other routes, requiring complex access, are usually converted onto an oral regimen for breakthrough pain prior to discharge. Since there has been no available device for a step-down oral PCA approach in the past, many patients continue on IV or other routes of PCA almost up until the time of discharge. This delay can create later problems when patients arrive home with a regimen not adequately tested prior to discharge. They may return for pain management to the emergency room or physician's office for additional adjustments due to their oral dose of pain medication not being optimally adjusted prior to discharge.

The MOD will be useful in managing patients on a stable oral regimen for breakthrough pain, as well as those who must adapt to an oral regimen after coming off an intravenous PCA regimen. ■

## References

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