

# Clinical and Economic Impact of Intra- and Postoperative Use of Opioids and Analgesic Devices

Robert T. Adamson, PharmD,<sup>1</sup> Indu Lew, PharmD,<sup>1</sup> Elena Beyzarov, PharmD,<sup>1</sup>  
Shilpa Amara, PharmD,<sup>1</sup> and John Reitan, PharmD<sup>2</sup>

Having just spent the early years of the 21st century focusing on what Congress declared as the Decade of Pain Control and Research, the health care community has made substantial progress in pain management. Working in collaboration with its partners in the Pain Care Coalition, the American Pain Society has been advocating for the passage of the National Pain Care Policy Act, which calls for numerous provisions, some of which include the establishment of 6 regional pain centers, the creation of a national pain and palliative care research and quality program, and a mandate requiring that American military personnel, veterans, and Medicare enrollees receive appropriate pain care services.<sup>1</sup> California has made medical license renewal contingent upon completion of a pain management continuing education program. In another monumental step forward, The Joint Commission issued new standards mandating that pain be considered a “vital sign,” in effect making it compulsory for health care professionals practicing within accredited health care facilities to enquire about, measure, and treat pain as they would temperature, blood pressure, pulse, and respiratory rate.<sup>2</sup>

Within the institutions at Saint Barnabas Health Care System (SBHCS), clinical and staff pharmacists play an integral role in the assessment and management of pain. At these facilities, clinical pharmacists participate in multidisciplinary pain committees and incorporate pain management into daily medical rounds, making certain that patients are receiving adequate pain relief and side effect management. At one of the acute care facilities, the pharmacy department has created a schedule of rotating pharmacists who make daily visits to inpatients identified as having low Hospital Consumer Assessment of Health Plans Survey (HCAHP) scores. One of the major reasons why hospitals receive poor HCAHP scores is related to patients not being given adequate drug information.

As such, pharmacists at SBHCS assess patients for appropriate analgesic therapy and focus on counseling them regarding expected outcomes/expectations and potential side effects of opioid therapy, as well as the importance of reporting alarming signs and symptoms. SBHCS pharmacists also emphasize to patients that they need to voice any inadequate pain relief, as we are well beyond the days where patients were expected to suffer from pain stoically. At SBHCS’s other practice site, a behavioral health facility, pharmacists regularly perform pain assessments on inpatients and outpatients, meet with patients to discuss successes and failures of previous and current treatments, work closely with physicians to develop individualized pain management plans, and perform close patient follow-up.

As SBHCS marks its successes by welcoming the opportunity to effectively manage pain with multiple modalities and accepting the challenges of balancing the benefits and risks of analgesia, its progress is somewhat overshadowed by the acknowledgment that gaps in assessment and treatment still exist. As one editorial somberly reflects, despite sophisticated research institutions, questions remain about the nature and effects of pain, and as such, the need to re-examine meanings and values inherent to the experience and expression of pain. Technology provides invaluable tools for diagnoses and treatments, but technology alone does not provide the diagnosis, heal the patient, or sustain the profession and practice of pain medicine.<sup>3</sup> This point is well-illustrated by evidence indicating that despite medical, technologic, and pharmaceutical advancement in the past decade, inadequate management of postsurgical pain (also called postoperative pain) remains common.

With more than 70 million surgeries performed annually in the United States, postsurgical pain is a ubiquitous condition among the population.<sup>4</sup> Although it is a predictable component of the recovery process, such pain is often poorly managed,

<sup>1</sup>Saint Barnabas Health Care System, South Plainfield, New Jersey; <sup>2</sup>RJM Group LLC, Woodbridge, Virginia.

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resulting in clinical and physiological changes that increase morbidity and mortality, diminish quality of life, and extend length of stay (LOS), thereby increasing hospital expenditures and reducing patient satisfaction. Effective relief of acute pain, on the other hand, may improve clinical outcomes, avoid complications, and conserve health care resources.

Opioid analgesics have long been established to be the most effective agents used for the management of moderate to severe postsurgical pain and are currently considered the mainstay of treatment. Adverse events related to opioid administration, however, may represent one important reason for their underutilization. Indeed, fear of gastrointestinal side effects such as nausea and vomiting, as well as respiratory depression, present major limitations for the widespread use of opioid analgesics.<sup>5,6</sup> Furthermore, management of opioid-related events often requires medical attention (eg, opioid antagonists, antiemetic agents) and increased pharmacy/nursing time, which may raise health care expenses.<sup>7</sup>

Because some opioid-induced adverse events are dose-related, conjunctive administration of another agent may help to reduce opioid requirements, thereby minimizing the potential for adverse events. In addition, combining medication regimens with varying mechanisms of action, often termed “multi-modal therapy,” may help to achieve synergistic analgesic effects.<sup>8</sup> Specifically, local anesthetic therapy is often administered with opioid analgesics to create such a multimodal approach to pain management.<sup>9</sup> These medications (eg, bupivacaine, ropivacaine) may be used alone or in combination with opioid therapy to interfere with pain transmission during or after a surgical procedure.

Furthermore, technological advances have helped to optimize postsurgical pain management. Use of patient-controlled analgesic (PCA) devices for delivery of opioid medications allows patients to administer smaller doses of medication, thereby minimizing the potential for serious adverse events such as oversedation and respiratory depression.<sup>10</sup> Moreover, data indicate that use of PCA may be more effective than conventional opioid analgesia in patients undergoing surgery.<sup>11</sup> The advent of infusion devices has also helped make continuous infusion of local anesthetic therapy possible. Historically, utilization of local anesthetic medications required repeated dosing, due to the short duration of action of these agents. Fortunately, the development of the infusion pumps has allowed for continuous medication delivery,<sup>9,12</sup> which has been proven safe and effective for management of postsurgical pain.<sup>12-16</sup>

Conversely, there are several drawbacks associated with use of PCA infusion devices, and these issues must be carefully considered when therapeutic decisions are made. Notably, the complexities associated with the setup, programming, and administration of PCA devices have rendered them a significant source of preventable medication errors, which include both operator and equipment errors. Because there are numerous steps involved in PCA administration, there is an increased opportunity for these errors to occur.<sup>17,18</sup> Moreover, adverse events such as respiratory depression, although unlikely, may still occur.<sup>19-21</sup> Similarly, many local anesthetic infusion pumps and other devices used for prolonged analgesia have inherent drawbacks (eg, inaccurate infusion rates, inability to customize infusion rates, high cost) and may be associated with adverse events such as insertion site infection, local anesthetic toxicity, catheter migration, and hematomas.<sup>6</sup> The drug delivery associated with these devices must be contrasted with the control and precision obtained when a surgeon administers, intraoperatively, a local anesthetic for analgesia. Furthermore, the management of PCA and local anesthetic infusion device-related adverse events may be cost-prohibitive, depending on the given situation.<sup>9,22,23</sup> As such, development of alternative analgesic devices and administration routes is encouraged. Approval is pending of one product that offers prolonged delivery of a nonopioid local analgesic with single intraoperative administration. This technology has the potential to serve as part of a multimodal regimen to manage postsurgical pain without the aforementioned limitations of PCA.

This monograph consists of 2 articles that discuss current issues in postsurgical pain management. The first article focuses on the role of opioids in managing postsurgical pain and details commonly observed medication-related adverse events, as well as the economic impact of managing these events. The second article explores the benefits and disadvantages or issues associated with infusion devices used to administer analgesic therapy in this patient population. This monograph is intended to provide pharmacists with a timely update on the inherent challenges involved in the use of various therapeutic techniques in postsurgical pain management.

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