

# Regional Anesthesia and PONV in the ASC

Nausea and vomiting continues to be a postoperative concern for clinicians and patients alike. Postoperative nausea and vomiting (PONV) is one of the two most common postoperative complaints, occurring in as many as 70% of high risk patients.<sup>1,2</sup> Generally, it is estimated that 20-30% of the surgical population will experience PONV if not treated prophylactically.<sup>1,3</sup> Even so, Apfel demonstrated that over 30% of patients receiving prophylactic antiemetics had breakthrough PONV with no difference between ondansetron, dexamethasone, and droperidol.<sup>1</sup> Though typically self-limiting, PONV can cause dehydration, electrolyte abnormalities, and other serious sequelae. As a result, PONV can lead to delayed recovery and even unexpected hospital admissions following ambulatory surgery.<sup>4,5</sup> Both of these factors can increase healthcare costs, in addition to greatly affecting patient satisfaction and quality of life.

When examining the data, it appears that the incidence of PONV is slightly less for outpatients than inpatients. However, it is believed that this difference is due to under reporting.<sup>6</sup> The cost of one episode of PONV is profound. Each episode of emesis in the post anesthesia care unit (PACU) increases the length of stay by 20 minutes.<sup>5</sup> Between labor and patient flow, it is estimated that just ten episodes per month can cost up to \$25,000 per year.<sup>7</sup> Most costs (70%–80%) incurred from nursing labor during prolonged PACU stay, associated with persistent PONV or adverse effects of antiemetics.<sup>5</sup> It is cited that 0.1-0.2% of unexpected admissions are due to PONV.<sup>8</sup> This number becomes significant when considering in 2006 there were 53.3 million ambulatory procedures performed.<sup>9</sup> Williams' evaluation of 948 outpatient ACL reconstructions revealed that a general anesthetic alone had a 17% unplanned admission rate, while this occurred in only 4% of those receiving a long term nerve block.<sup>10</sup> Eighty-one percent of these admissions were due to pain, PONV, or both. When using a peripheral nerve block, they calculated a potential annual savings of almost \$100,000 for 250 ACL reconstructions and extrapolated this to a savings of about \$1.2 million in hospital costs for all outpatient orthopedic surgeries.<sup>10</sup> The cost reductions in this study were due to the nerve block allowing faster emergence, PACU bypass, and less pain and PONV.

The Society for Ambulatory Anesthesia (SAMBA) has classified PONV risk factors for adults into three categories: patient specific, anesthetic, and surgical. Those that can be altered by the anesthesia team include use of volatile agents, use of nitrous oxide, and perioperative opioid use. Identifying high risk patients and minimizing those factors that can be controlled is the first step in prevention.<sup>11</sup> The 2007 SAMBA guidelines state that regional anesthesia (RA) is a recommended strategy to reduce baseline risk.<sup>8</sup> It is also suggested that RA be considered in high risk patients when possible. One study found that PONV was nine times more likely with patients receiving general anesthesia (GA) over those receiving RA.<sup>11</sup> It has been well documented that intraoperative and postoperative opioid use is associated with increased PONV risk in a dose related manner.<sup>12</sup> With that being said, not only should the use of RA alone decrease risk, but

RA in conjunction with GA should also. RA can provide excellent intra and/or postoperative analgesia, reducing narcotic requirements. In one meta-analysis, Liu et al concluded that peripheral nerve blocks (PNB) were associated with PACU bypass, decreased PACU time, decreased nausea, and increased patient satisfaction.<sup>4</sup>

The Andrews Institute ASC is a busy eight operating room surgery center. It opened in March 2007 and currently averages 450 cases per month. It is internationally recognized as an orthopedic and sports medicine facility, but also does ENT, general surgery, ophthalmology, neurosurgery and plastic surgery cases. The orthopedic cases include very invasive and painful procedures such as tibial osteotomies, meniscal transplants, open knee cartilage transplants, major shoulder surgeries, and multiple knee ligament reconstructions. In outpatient facilities, it is critical that patients recover in a smooth and timely fashion to maintain orderly transition from the OR to PACU to home. Postoperative opioid use is one of the four primary predictors of PONV.<sup>2</sup> Understanding that narcotic use can greatly affect PONV risk and subsequently discharge, our approach is to use a very aggressive multimodal preemptive approach to pain management. The mainstay of this approach is regional anesthesia/analgesia. Our goal from the inception of the facility has been to minimize pain while using little to no narcotics. In the first four years of operation, we performed over 5,000 ultrasound-guided PNBs in our 14,872 cases.

The typical orthopedic case at the Andrews Institute receives a PNB in the preoperative holding area, using only midazolam for sedation and amnesia. Intraoperative anesthesia is generally accomplished by either a propofol infusion or a general technique using an LMA. Other than the provider-dependent choice to use fentanyl during induction, we rarely need narcotics for the procedures. In fact, in 2010 only 11.7% of all cases required postoperative narcotics prior to discharge. We also administer prophylactic dexamethasone and ondansetron to most patients due to the minimal cost and great benefit of these medications. This multimodal approach emphasizing regional anesthesia has allowed us to achieve a very low rate of PONV, and we have never admitted a patient from our facility for PONV. A five month chart review revealed that our PONV incidence is less than 3%, using nursing notation or administration of antiemetic in PACU as an indicator.

Post discharge nausea and vomiting (PDNV) is becoming more evident as the number of ambulatory procedures increases. Affecting 20-50% of patients<sup>3</sup>, it can prolong return to daily activities. Though not well studied, continuous peripheral nerve blocks (CPNB) may lead to less post discharge opioid needs potentially reducing the nausea and vomiting experienced at home. Over 2600 of our blocks have been CPNBs where patients are sent home with a continuous infusion of local anesthetic lasting three to four days. We have not evaluated PDNV in the past; however currently are, in hopes that avoiding oral narcotic use at home will greatly reduce PDNV.

There is an apparent need for specific studies that assess regional techniques combined with general anesthesia and continuous peripheral nerve blocks for home use to evaluate

PONV and PDNV. At the Andrews Institute, we feel strongly these procedures are extremely valuable when it comes to keeping our patients satisfied; discharging in a timely manner; and cost savings for our patients, facility, and the health care industry.

Gregory V. Hickman, MD  
Medical Director/ Anesthesia Director  
Regional Anesthesia Fellowship Director  
Andrews Institute ASC  
Gulf Breeze, FL

Amber Martin-Ross, MD MPH  
Regional Anesthesia Fellow  
Andrews Institute ASC  
Gulf Breeze, FL

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