Ambulatory surgery continues to grow in popularity. Currently, 60% of all procedures performed in the United States are done on an ambulatory basis. Surveys report that postoperative pain is a greater concern for patients than surgical outcome, and optimization of analgesia after ambulatory surgery can improve patient satisfaction and quality of life.

**Optimization of Analgesia:**

**General anesthesia techniques**

- Recent studies have reported the possibility of reduced postoperative pain after ambulatory procedures with the use of a propofol based anesthetic versus a volatile based anesthetic. Some studies suggest that propofol may have analgesic properties and may also prevent opioid induced hyperalgesia in patients undergoing breast cancer surgery. However these findings are inconsistent, and the magnitude of effect is limited. Opioid use is not markedly reduced, and postoperative pain scores are only marginally decreased for a relatively brief duration (<12 hrs).
- Intravenous infusions of lidocaine (1.5-3 mg/kg/hr) have resulted in impressive results after major abdominal surgery, and a meta analysis noted reduction in pain scores, nausea, ileus, and length of stay. However, use of lidocaine for less invasive procedures such as total hip replacement has been unimpressive. A recent RCT examined effects of IV lidocaine infusion for ambulatory surgery patients. Opioid use was reduced without affecting incidence of nausea. Pain scores were lower while in the PACU but not different between groups at home.

**Regional Anesthesia Techniques**

**Single shot**

- A previous meta analysis has examined RCTs comparing GA with central neuraxial and peripheral nerve blocks for anesthesia. Central neuraxial techniques were mixed for comparative outcomes with lower pain scores and less nausea but a longer time until discharge from the ASU (mean of 35 min). In contrast, use of peripheral nerve blocks was generally superior with less pain and nausea, faster discharge, and greater patient satisfaction.

**Continuous Perineural Catheters**

- These beneficial effects of peripheral nerve blocks can now be extended to the home for patients with the advent of perineural catheters with portable or disposable pumps. A meta-analysis has examined RCTs that compared perineural catheters dosed with local anesthetic vs saline. All groups had free access to systemic opioids. The perineural catheters with local anesthetics were clearly superior with lesser pain scores at rest and activity for 48 hrs after surgery. The active catheters had reduced opioid use with reduction in nausea, sedation, and pruritus.

**Alternatives to Continuous Catheters**

- Despite the above documented advantages, ambulatory use of perineural catheters may be underutilized due to concerns over staffing, equipment needs, and potential minor and major complications. Large scale surveys report relatively low incidences of major complications (<1%) but substantial incidences for technical (kinking, blocked, displaced) complications and bacterial colonization (10-28%). Thus, interest has grown in the possibility of adding adjuncts to a single shot block in order to prolong effect and potentially obviate the need for a perineural catheter.
- Ultrasound guidance: A recent systematic review analyzing RCTs that compared ultrasound guided peripheral nerve blocks versus other guidance techniques (mostly nerve stimulator) found some evidence for prolonged sensory duration perhaps due to improved deposition of local anesthetic.
- Dexamethasone: Several RCTs have documented prolongations of peripheral nerve blocks with addition of dexamethasone (~8mg) to mepivacaine (332 vs 228 min), ropivacaine (22.2 vs 11.8 hrs), and bupivacaine (22.4 vs 14.8 hrs). Mechanism of prolongation is unknown.
- Buprenorphine: A recent RCT noted that addition of buprenorphine (0.3 mg) prolonged sciatic block with bupivacaine.
POSTOPERATIVE MULTIMODAL SYSTEMIC ANALGESIA

- NSAIDs: Meta analyses indicate that NSAIDs, especially in multiple doses, are highly useful analgesic adjuncts. They consistently reduce pain scores, reduce opioid use and opioid related side effects. However, prolonged use of NSAIDs is associated with gastrointestinal risk, renal impairment, and increased bleeding for some surgical procedures (tonsils). Combining acetaminophen with NSAIDs provides further analgesia as documented by a separate qualitative meta-analysis. A recent meta analysis examined a small number of RCTs to determine effects of a single dose of perioperative ketorolac on postoperative analgesia and opioid related side effects. This meta-analysis also noted mild reductions in pain scores, opioid use, and opioid related side effects with a single dose of ketorolac.

- Dexamethasone: Although commonly used to prevent PONV, a recent meta analysis of RCTs noted that dexamethasone (0.1->0.2 mg/kg) also improved pain scores for as long as 24 hours and decreased opioid consumption. Furthermore, a recent RCT observed that administration of dexamethasone 0.1 mg/kg reduced opioid consumption and improved QoR40 scores after ambulatory gynecological laparoscopy.

- Ketamine: A recent meta analysis of 4,701 patients observed potential beneficial effects of ketamine. Opioid consumption was reduced and time to first analgesic increased and effects were greatest for patients with highest pain scores. PONV was less frequent but hallucinations were increased.

- Gabapentanoids: Several meta analyses reported benefits for gabapentin and pregabalin. These agents (primarily gabapentin) reduced pain scores, opioid consumption and related side effects, but somewhat increased risk of sedation and dizziness (NNH of 12-35).

REFERENCES