**Abstract**

Why is pain control so important?
- Patient satisfaction
- Faster rehabilitation & mobilization
- Length of hospital stay (LOS)
- Cost

Disadvantages of Opioids
- Ileus
- Nausea & vomiting
- Respiratory depression
- Tolerance & dependence

**Research Purpose**
- Compare Bupivacaine vs. Exparel (liposomal bupivacaine) in Total Knee Arthroplasty (TKA) & Abdominal Surgeries
- TKA
  - Femoral Nerve Block (FNB)
- Periarticular & intraarticular injections
- Abdominal surgeries (TAP block)
  - Laparoscopic hysterectomy
  - Laparoscopic colorectal surgery
  - Laparoscopic hand-assisted donor nephrectomy
- Comparison of Outcomes
  - Postoperative pain, opioid requirements, LOS, patient outcomes, cost

**Exparel (Liposomal Bupivacaine)**
- DepoFoam technology
- Encapsulates bupivacaine into liposomes
- Released as lipid membranes are reorganized
- Onset: Rapid
- Duration of action: 72 hours
- Plasma levels: up to 120 hours
- Peaks twice
  - 1st: 1 hour
  - 2nd: 12-36 hours
- 95% protein bound
- Metabolism: primarily hepatic conjugation
- Excretion: Urine
- Half life: 13-34 hours
- Cost:
  - 1.3% $21.01/ml
  - 135 mg (10 ml) = $180.35
  - 266 mg (20 ml) = $334.18
- FDA approved
  - Single dose infiltration in adults
  - Intercostal brachial plexus blocks
  - Use cautiously
    - Hepatic disease
    - < 18 years of age
    - Pregnancy
    - Bradycardia & death
  - Not recommended for epidural, intrathecal, intravascular, intraarticular use, nerve blocks other than intercostal
  - Do not use needle < 25 gauge
  - Do not administer w/ other LA = toxicity
  - Safe to administer 20 min after lidocaine @ same location
  - Do not administer other forms of bupivacaine within 96 hours

**Femoral Nerve Block**
- 12 articles: Exparel in periartricular injections
  - 2 articles supported Exparel > Bupivacaine
    - 1 article: Exparel → ↓ pain & total opioid consumption, ↓ time to 1st narcotic rescue, ↓ opioid free patients @ discharge
    - 1 article: Exparel ↓ LOS, ↓ patient satisfaction, ↓ PONV.
  - Several studies did not justify Exparel due to high costs
- 2 articles compared Exparel injections to FNB
  - Both supported Exparel
    - PAs using Exparel = opioid usage, improved/faster ambulation, ↓ falls, LOS & costs
- 6 articles compared Exparel TAP blocks in abdominal surgeries
  - 5 studies compared Exparel to Bupivacaine
    - 1 study compared TAP block with Exparel to PCA pumps
  - 5 studies supported Exparel (improved pain control, ↓ PONV, LOS, opioid requirements, quicker return of bowel function, & ↓ time to ambulation without significant cost increase)
- Exparel → ↓ opioid-free patients 72 hours postop.
- Barron et al. (2017) did not support Exparel use for post-site analgesia in laparoscopic or robotic surgeries
- Exparel → ↓ pain on POD 3 but ↓ opioid consumption or quality of life

**Conclusion**
- Challenging to determine efficacy due to subjectivity of pain and lack of consistency throughout the existing literature
- Recommendations for future studies
  - Larger sample sizes
  - Standardized injection techniques
  - Standard protocols for managing breakthrough pain
  - PRN versus scheduled postop analgesics
  - Control & study groups should receive the same supplemental analgesics/ doses
  - Longer follow-up periods
  - Standard # of port sites for laparoscopic surgeries

**References**