



MULTIPLE CONTINUOUS PERIPHERAL NERVE BLOCKS AND KETAMINE INFUSIONS TO AID REHABILITATION AFTER SPLENECTOMY AND SEVERE POLYTRAUMA

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Introduction

- Opioids offer effective analgesia for polytrauma but with numerous side effects
- Site-specific, titratable and prolonged analgesia is ideal for multiple surgeries and long-term rehabilitation required in complex polytrauma cases
- Continuous peripheral nerve blocks (CPNBs) provide durable analgesia, but maximum dose limits use

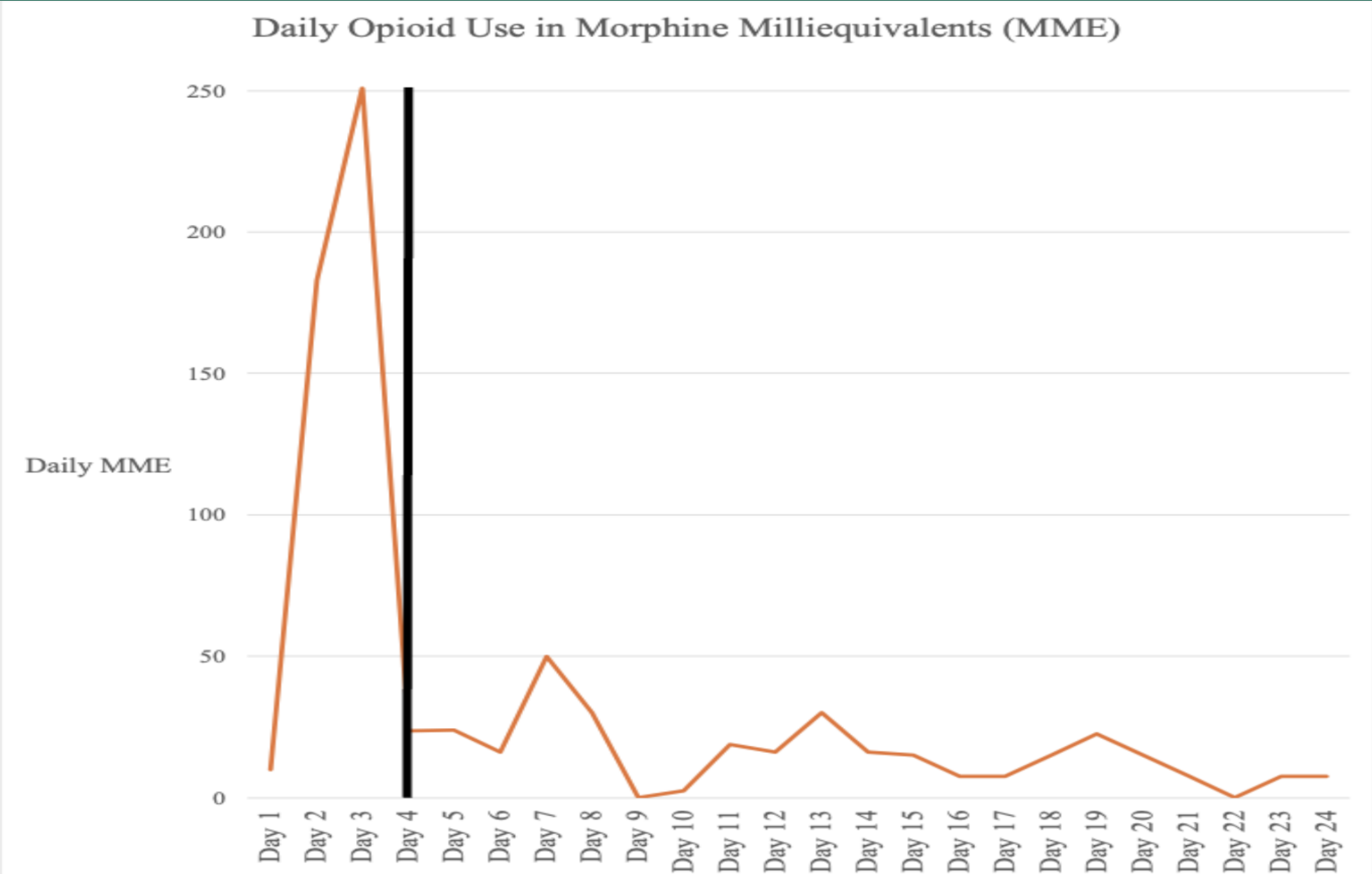
Case

- 27-year-old male pedestrian presented after being struck by a vehicle with devastating injuries
- Imaging revealed tibial and fibular fractures bilaterally, left and right popliteal artery injuries and splenic laceration requiring splenectomy
- Acute pain service (APS) was consulted after left below knee amputation on hospital day 2
- Six CPNBs were performed utilizing pulsed intermittent bolus (PIB) delivery: Bilateral femoral, sciatic, and rectus sheath (RS)
- Pain and opioid requirements greatly decreased facilitating active participation in physical therapy

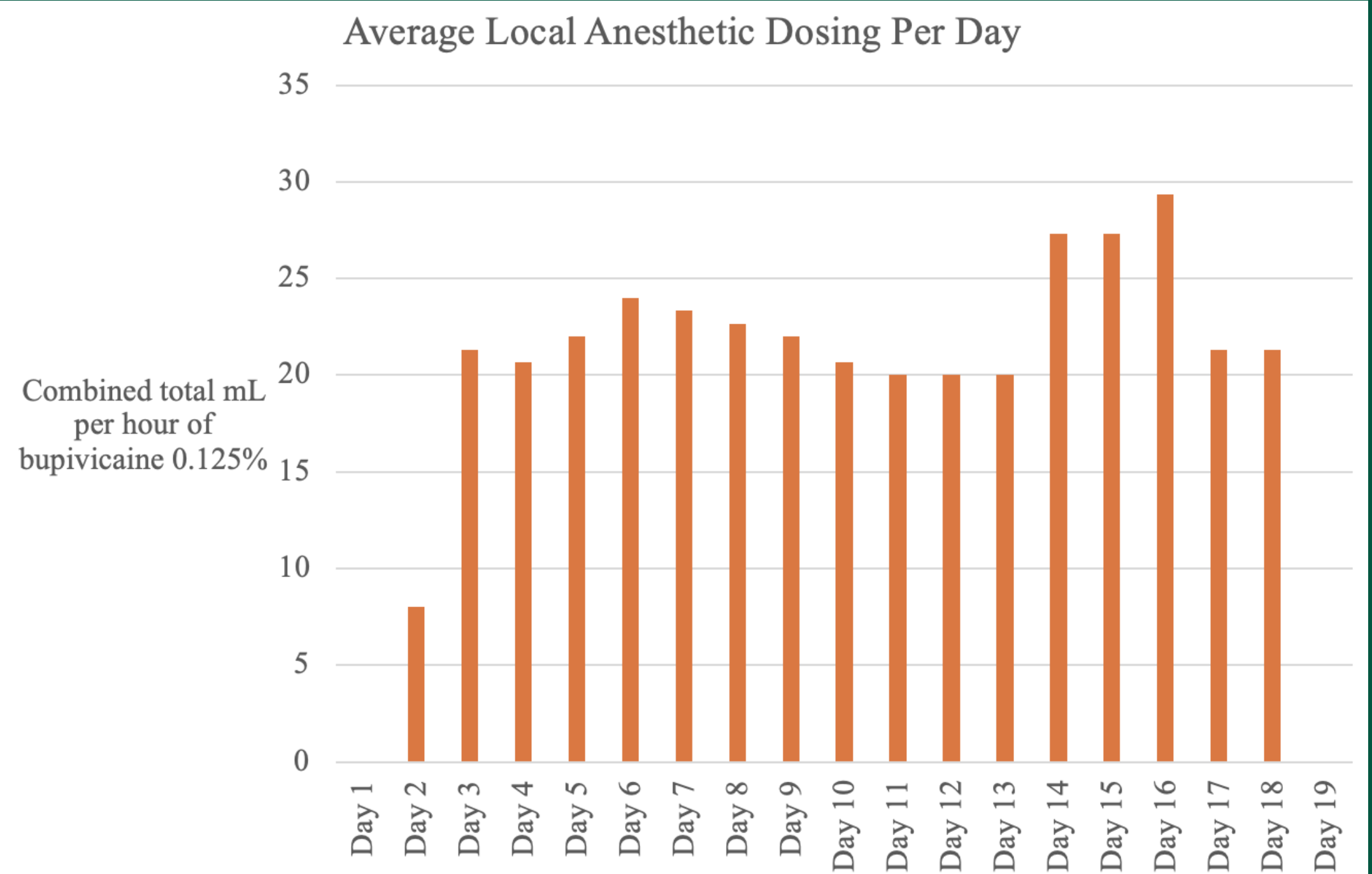
Discussion

- Using several CPNBs increases the risk of local anesthetic systemic toxicity (LAST)
- Trauma-associated Alpha-1-Acid glycoprotein elevation reduces local anesthetic free plasma concentration
- Local anesthetic dose is reduced by 1/3 using Q3 hour PIB dosing, and sequential hourly bolus timing mitigates plasma local anesthetic spikes
- Scheduled multimodal analgesia (MMA) used to reduce excessive reliance on local anesthetics
- Besides catheter dislodgements, long term (17 days) CPNB use was not associated with infection, LAST, or other complications
- Infrastructure and patient education are imperative for safe and successful use of multiple CPNBs

SIX CPNBs used for polytrauma patient over **17 days** without LAST, infection, or major complication. Significant reduction of opioids and pain. **PIB dosing** and scheduled MMA reduced local anesthetic requirements.



Daily opioid requirements measured in morphine milliequivalents (MME). The black vertical line indicates placement of the final CPNB performed on hospital day 4 along with a substantial change in opioid consumption.



Combined hourly total local anesthetic volume (mL) dosing each hospital day utilizing sequential PIB regimen. Increased dosing observed on hospital days 14–18 reflects a change to continuous infusion for the left subgluteal sciatic CPNB.



Bilateral lower extremity wounds on initial presentation.

Hospital Day	Acute Pain Service Interventions
Day 2	Left and Right Femoral CPNB each bolused with 20mL; PIB of 12mL q180 min each
Day 3	Left Subgluteal Sciatic CPNB bolused with 20mL; PIB of 20mL q180 min Bilateral Rectus Sheath CPNB bolused with 20mL total; PIB of 20mL q180 min total
Day 4	Right Femoral CPNB decreased to PIB 6mL q180 min Left Subgluteal Sciatic CPNB decreased to PIB 12mL q180 min Right Subgluteal Sciatic CPNB bolused with 20mL; PIB of 12mL q180 min
Day 5	Right Femoral CPNB increased to PIB 10mL q180 min Ketamine infusion administered at 0.5 mg/kg
Day 6	Left and Right Subgluteal Sciatic CPNBs increased to PIB 14mL q180 min each Right Femoral CPNB increased to PIB 12mL q180 min
Day 7	Bilateral Rectus Sheath CPNB decreased to PIB 18 mL q180 min total Right and Left Femoral CPNB each replaced and bolused with 10mL; PIB of 12mL q180 min
Day 8	Left Femoral CPNB replaced and bolused with 10mL; PIB of 14mL q180 min Right Femoral CPNB replaced and bolused with 10mL; PIB of 12mL q180 min Left Subgluteal Sciatic CPNBs replaced and bolused with 5mL; PIB of 14mL q180 min Right Subgluteal Sciatic CPNBs replaced and bolused with 3mL; PIB of 10mL q180 min Ketamine infusion administered at 0.7 mg/kg
Day 9	Bilateral Rectus Sheath CPNB decreased to PIB 16 mL q180 min total
Day 10	Bilateral Rectus Sheath CPNB decreased to PIB 12 mL q180 min total
Day 11	Right Femoral and Sciatic CPNB increased to PIB 16mL q180 min each Bilateral Rectus Sheath CPNB removed
Day 12	Right Femoral CPNB replaced with Right Fascia Iliaca CPNB bolused with 15mL; PIB of 16mL q180 min Ketamine infusion administered at 1 mg/kg
Day 14	Left Subgluteal Sciatic CPNB bolused with 30mL; continuous infusion of 12mL per hour
Day 15	Ketamine infusion administered at 0.75 mg/kg
Day 16	Left Subgluteal Sciatic CPNB increased to continuous infusion of 14mL per hour
Day 17	Left Subgluteal Sciatic CPNB increased to continuous infusion of 16mL per hour Left Femoral and Right Femoral Fascia Iliaca CPNBs removed
Day 18	Ketamine infusion administered at 0.75 mg/kg
Day 19	Left and Right Subgluteal Sciatic CPNBs removed prior to discharge

Acute Pain Service Interventions over the course of care. All initial boluses were with 0.5% bupivacaine and pulsed intermittent boluses with 0.125% bupivacaine. **Dark grey** rows indicate when a CPNB was started or replaced. **Light grey** rows indicate when CPNB maintenance functions were performed. **White** rows indicate ketamine infusion administration.

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