Perioperative Peripheral Nerve Block and Local Anesthetic Exposure in Foot and Ankle Arthrodesis: A Propensity-Matched Cohort Study

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ASRA PAIN MEDICINE
25th Annual Pain Medicine Meeting
November 5-7, 2026 | Tampa, Florida
#ASRAFALL26

Introduction

- F&A arthrodesis is associated with substantial postoperative pain, requiring effective perioperative analgesia.
- Analgesic strategies include GA alone, GA + PNB, and GA + LA.
- There is limited large-scale, real-world evidence that directly compares these strategies and their associations with postop analgesic exposure and pain diagnoses.
- **AIM:** Compare postop analgesic exposure, pain diagnoses, and ED utilization among patients undergoing F&A arthrodesis with GA alone, GA + PNB, or GA + LA, including direct comparisons between PNB and LA exposure.

Methods

TriNetX Global Collaborative Network

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Cohort Identification: Adults (18yo+) who underwent ankle arthrodesis between 2015-2025.
Patients stratified into 3 cohorts based on anesthetic technique: GA alone, GA + PNB, GA + LA based on ICD-10 and CPT codes

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Propensity Matching: 1:1 based on age at surgery, gender, prior opioid use/dependence, nicotine dependence, alcohol abuse, diabetes mellitus, obesity, chronic pain syndrome, heart failure, prior anesthetic injections, depression, anxiety, COPD, and chronic kidney disease

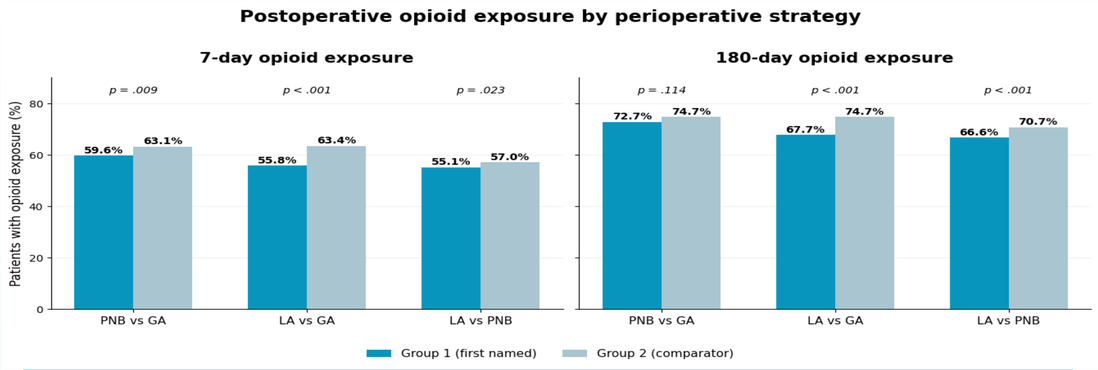
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Analysis: Outcomes analysed at 7 days and 180 days post-operation via chi-square analyses:
Including opioid medications, non-opioid pain medications, ED visits, and postprocedural pain

Arthrodesis patients before propensity-score matching

- GA alone: **n = 2,587**
- GA + PNB: **n = 9,822**
- GA + LA: **n = 6,938**

Results



Primary Outcome: *Both PNB and LA were associated with lower 7-day opioid exposure than GA alone; lower opioid exposure persisted through 180 days with LA but not PNB.*

Secondary Outcomes

- Acute postprocedural pain at 7 days were more frequent with both PNB (12.6% vs 4.4%; RR 2.892, $p < 0.001$) and LA (7.1% vs 4.3%; RR 1.634, $p < 0.001$) compared with GA alone, but were less frequent with LA than PNB (6.9% vs 11.2%; RR 0.613, $p < 0.001$).
- No significant differences in 7-day ED utilization were observed. At 180 days, ED utilization was lower with PNB versus GA (15.3% vs 17.5%; p=.039) and LA versus GA (14.5% vs 17.4%; p=.004), with no difference between LA and PNB.
- Chronic postprocedural pain did not differ between LA and PNB at 180 days (0.2% vs 0.2%; p=1.000).
- LA was associated with greater nonopioid pain-medication exposure than PNB at 7 and 180 days.

Discussion

- Both LA and PNB were associated with lower early opioid exposure vs GA alone, with a larger relative reduction observed with LA at 7 days.
- The opioid-sparing benefit persisted to 180 days only with LA whereas the PNB advantage was no longer significant; LA also outperformed PNB at both 7 and 180 days.
- Coded acute postprocedural pain was more frequent with both LA and PNB than GA alone, but less frequent with LA than PNB. This discordance may reflect differences in documentation or rebound pain following PNB resolution.

Conclusion

Perioperative LA was associated with lower postoperative opioid exposure than GA alone and PNB through 180 days following F&A arthrodesis. These findings support further prospective investigation of LA as a potential longer-term opioid-sparing strategy.