

# The Influence of Ongoing Opioid Use in Patients with Ultrasound Guided Blocks for Shoulder and Knee Surgeries, a 6-Month Review

C. Gibbs, M. Fredericks S. Ahmadzadeh, K. Skidmore, D. Duplechin, C. Rodriguez, S. Shekoohi, A. Kaye

Department of Anesthesiology, Louisiana State University Health Shreveport



## INTRODUCTION

Opioid prescriptions postoperatively have increased over the last several decades. While effective at treating acute pain following surgery, prolonged use is associated with risks of tolerance, addiction, and overdose. The opioid crisis has pushed legislature and medical groups to investigate alternative methods to control acute postoperative pain. The literature shows that regional anesthesia is strongly associated with reduced opioid use in the immediate 72 hours postoperatively, but little research tracks how opioid consumption varies long term (1, 2).

This study tests the hypothesis that regional anesthesia utilization is associated with a sustained reduction in opioid consumption at 1, 3, and 6 months postoperatively.

## GOALS AND OBJECTIVES

We hypothesize that controlling acute pain after orthopedic surgeries reduces the incidence of chronic opioid use. To examine whether there is a dose-response effect, we built upon the fact that the peripheral nerve block (PNB) we utilize before upper body orthopedic surgery (interscalene nerve block) may be more effective than our most performed PNB before lower body surgery (adductor canal). This stems from the FDA indication allowing long-acting local anesthetic injection in the interscalene PNB, while not in the adductor canal block. Additionally, the adductor canal block often misses additional pain fibers. To control for confounding variables, we examined if patients were preoperatively prescribed opioids, along with other baseline characteristics.

## MATERIALS & METHODS

We obtained IRB approval from Louisiana State University Health Sciences Shreveport for our retrospective study of electronic medical records. All patients undergoing orthopedic surgery in the ambulatory center at St Mary Medical Center between July 2021 and July 2024 were included for screening. The inclusion criteria included total shoulder arthroplasty (TSA), reverse total shoulder arthroplasty (TRSA), or knee arthroscopy. The primary outcome was an opioid refill prescription at 1 month, 3 months, and 6 months postoperatively. The confounding variables examined were preoperative prescription of opioids, age, sex, race, obesity, diabetes, hypertension, chronic pulmonary disease, arthritis, and the identity of the prescribing surgeon. The primary research variable was placement of a PNB. A secondary research variable was upper or lower body surgery. Chi square analysis was used for one-month opioid refill incidence of the primary and secondary variables, as well as the preop confounding variables using SAS software.

## RESULTS

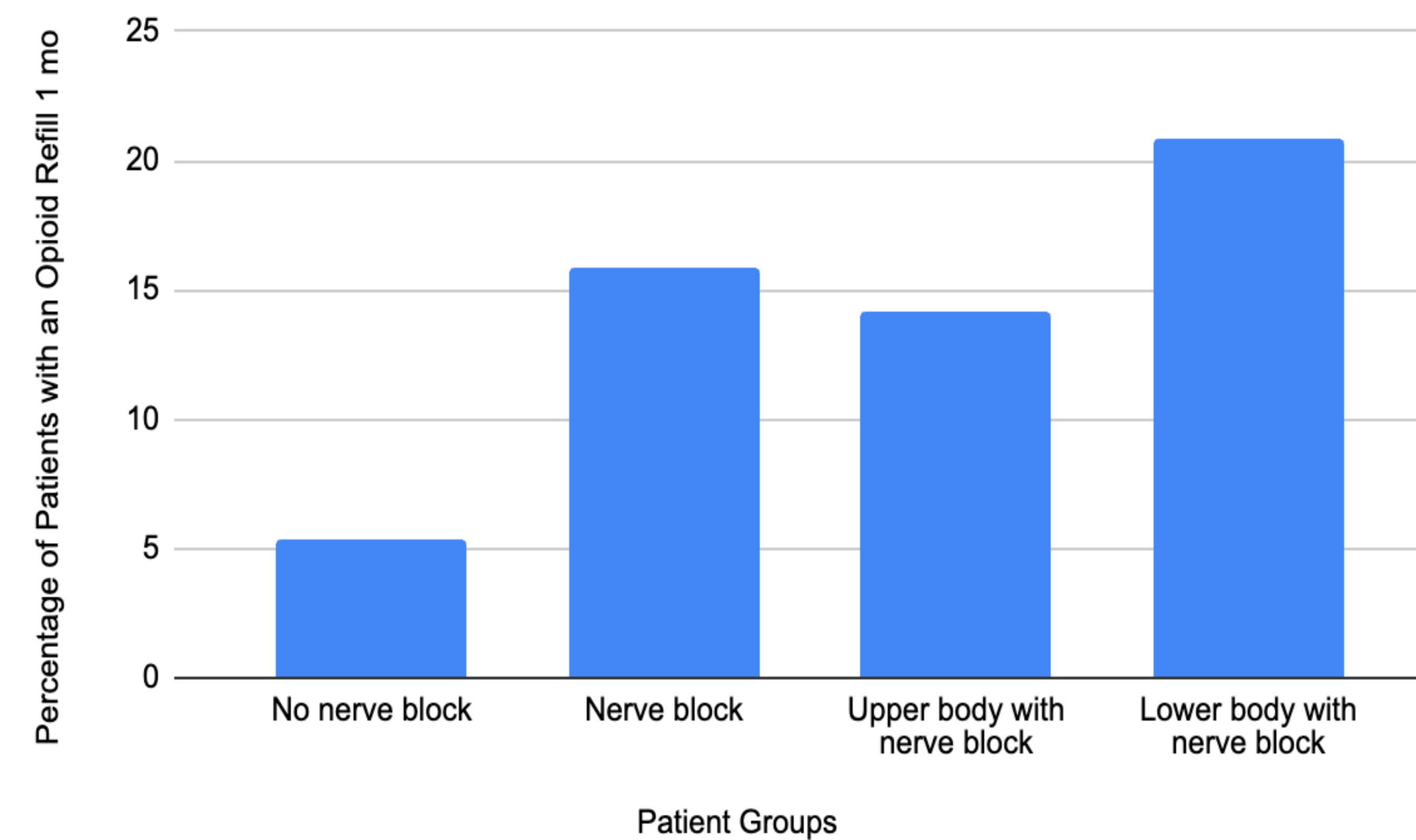
Of 522 patients who underwent a TSA, TRSA, or knee arthroscopy, 56 (10.73%) did not receive a preoperative PNB. Among this "placebo" group, 5.36% required opioid refills at 1 month, 3.57% at 3 months, and 0% at 6 months. Of those who received a PNB, postoperatively, 15.07% required opioid refills at one month, 2.95% at 3 months, and 0.91% at 6 months. Statistical analysis by SAS software and t-test showed opioid use declined after 1 month. No significant difference in opioid consumption among patients with comorbidities

## RESULTS (CONTINUED)

was detected, although one surgeon prescribed significantly more opioids. PNB was associated with an increased use of opioids at 1 month, although not significantly ( $p=0.057$  with Yates' correction).

14.12% of patients having upper body surgery with a PNB required opioid refills at 1 month compared to 20.8% of patients having lower body surgery with a PNB ( $p=0.0807$ ).

### Opioid Prescription Refills: 1 Month



## DISCUSSION

While not all the data at the 3- and 6-month points could be collected yet, these pilot data indicate 18% of patients required at least one opioid refill within 6 months of TSA, RTSA, or knee arthroscopy, despite receiving a PNB. Chronic opioid use postoperatively at one month was not significantly related to age, sex, race, or comorbidities. Data is currently pending in 5.6% and 15.9% of patients for the 3- and 6-month points, respectively. When comparing the upper and lower body surgery

## DISCUSSION (CONTINUED)

groups at 1 month, the lower body group demonstrated an absolute 6.68 percentage points higher incidence in opioid prescription. This could be because Exparel(R)'s long-acting bupivacaine FDA indications limit use to upper body one-shot PNB. Additionally, knee surgery is notoriously nearly the most painful surgical site and is fed by sciatic nerve branches missed by our most common PNB, adductor canal.

One limitation of this study is sample size. To prove a drop in incidence in opioid refills at one month, an increase to  $n_1=892$  and  $n_2=298$  is needed for upper and lower body surgery, respectively.

## CONCLUSIONS

Our results suggest PNB prior to orthopedic surgery does not significantly reduce opioid use at one month postoperatively. However, the location and duration of the medications in the PNB may influence the need for opioid refills.

Our future research in this study group will include searches for why the patients without a PNB requested fewer opioid refills, such as different preoperative opioid regimen or nonopioid techniques. One possibility is the severe rebound pain after a short-acting-one shot PNB wears off can stimulate a high incidence of opioid refills at 1 month.

## REFERENCES

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