

Rethinking Neuraxial Anesthesia: Motor-Sparing Regional Blocks With MAC For Primary Total Knee Arthroplasty

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INTRODUCTION

Rising demand for primary total knee arthroplasty (TKA) has stimulated the development of protocols that facilitate early recovery and mobilization.

Post-operative motor blockade and occasional placement failure with mepivacaine spinal anesthesia has driven interest in motor-sparing regional anesthetic techniques.

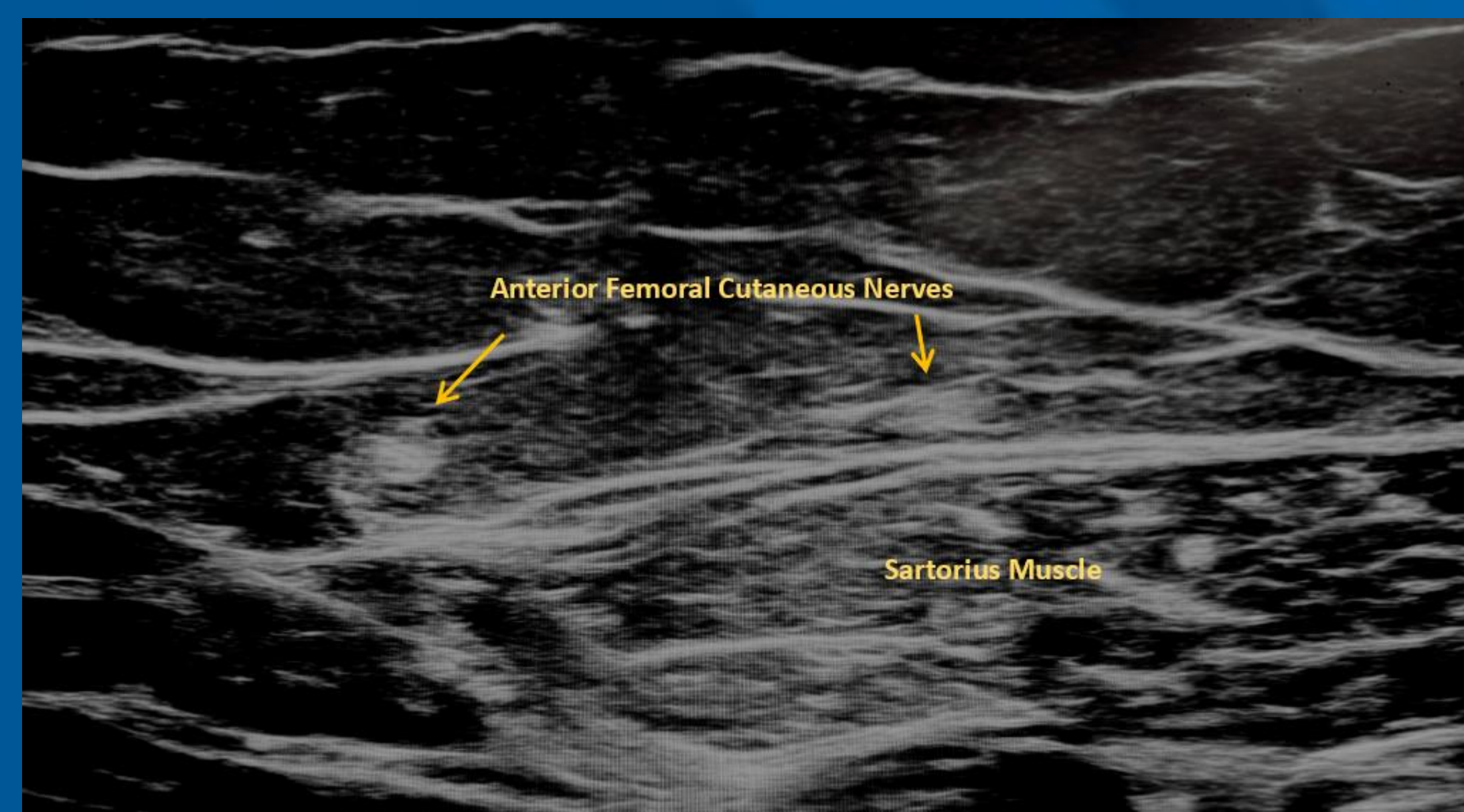
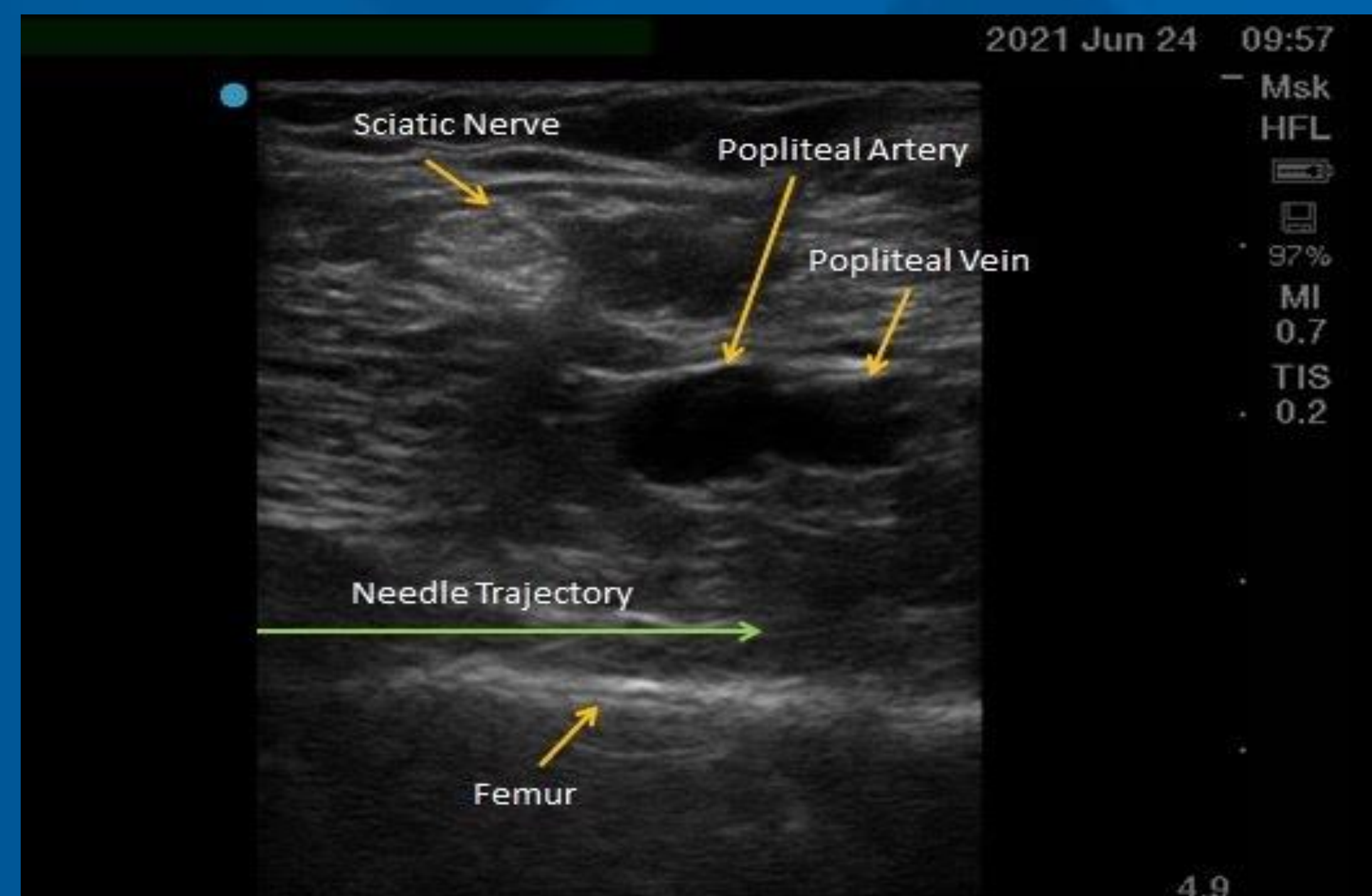
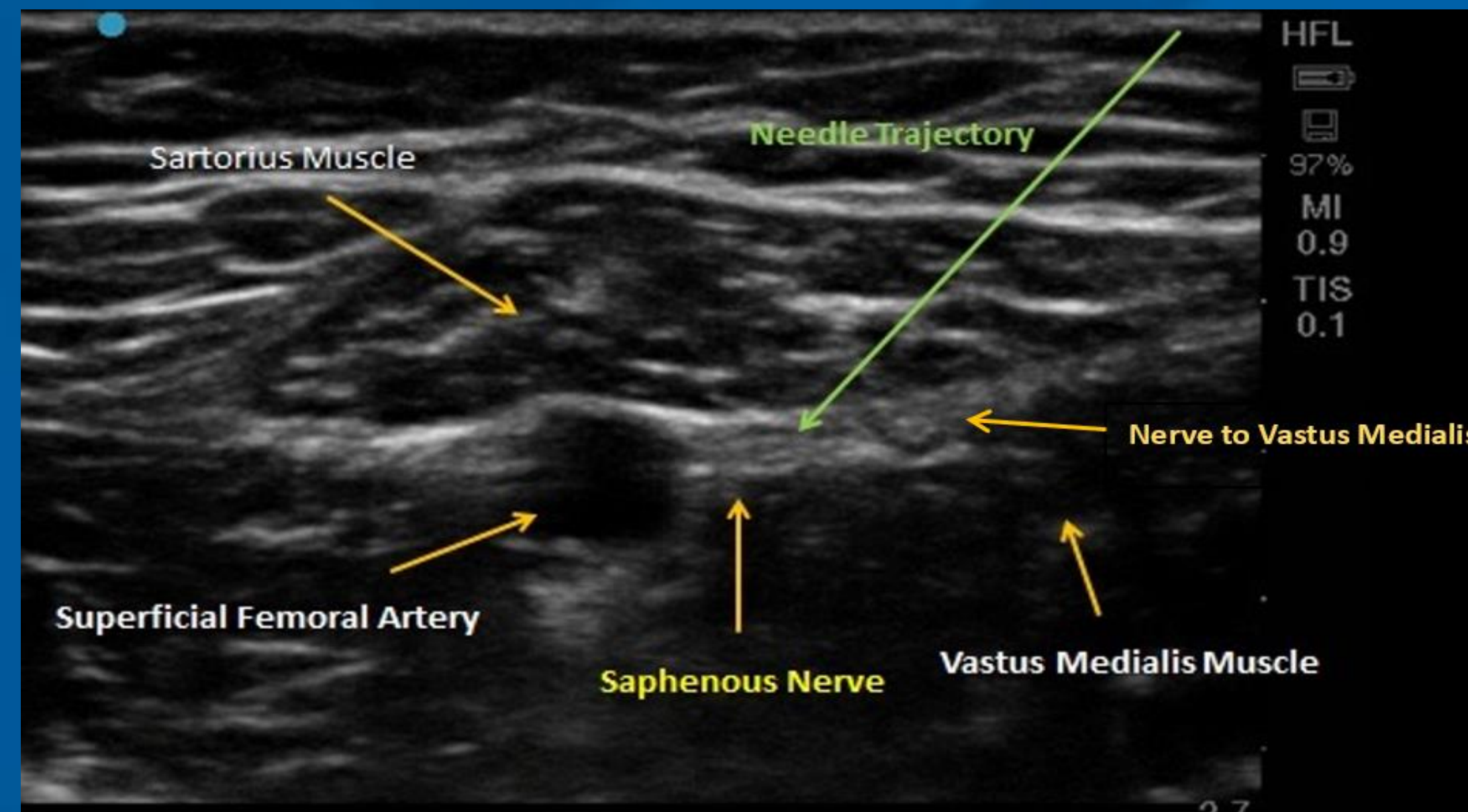
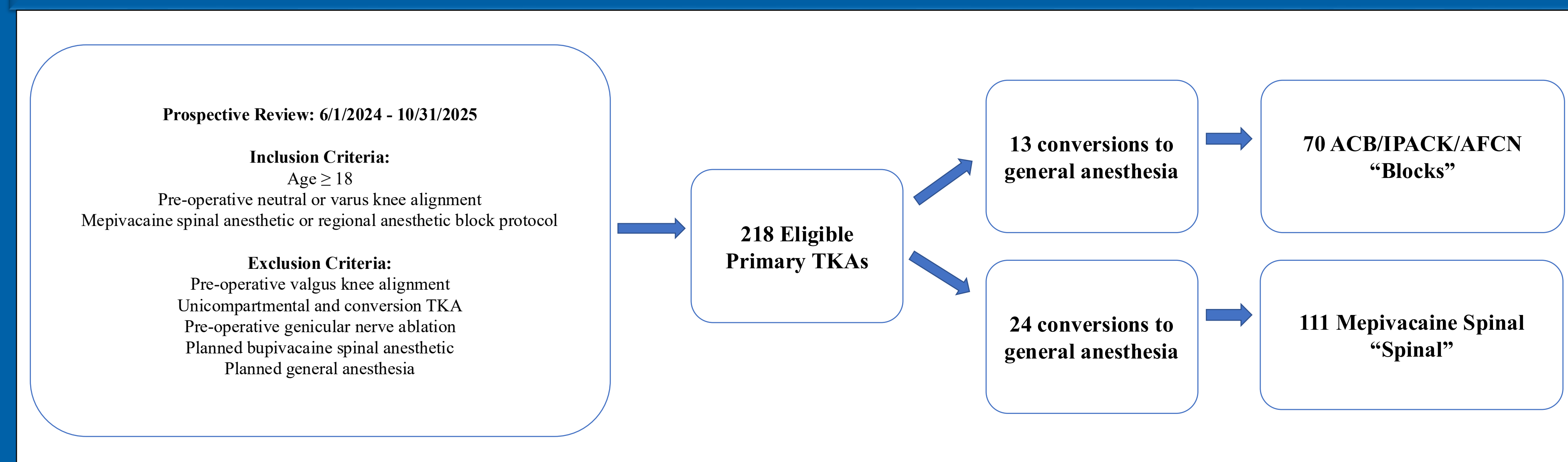
We implemented a novel anesthetic protocol incorporating pre-operative motor-sparing regional anesthesia – adductor canal (ACB) targeting saphenous nerve and nerve to vastus medialis, infiltration between the popliteal artery and the capsule of the knee (IPACK), and anterior femoral cutaneous nerve blocks (AFCNB) – combined with intra-operative monitored anesthesia care (MAC) using propofol.

Regional anesthesia techniques have demonstrated benefits in post-operative pain and early mobilization after primary TKA; however, direct comparisons with traditional mepivacaine spinal anesthetics remain limited. Additionally, the feasibility of combining regional anesthesia with MAC has not been well described.

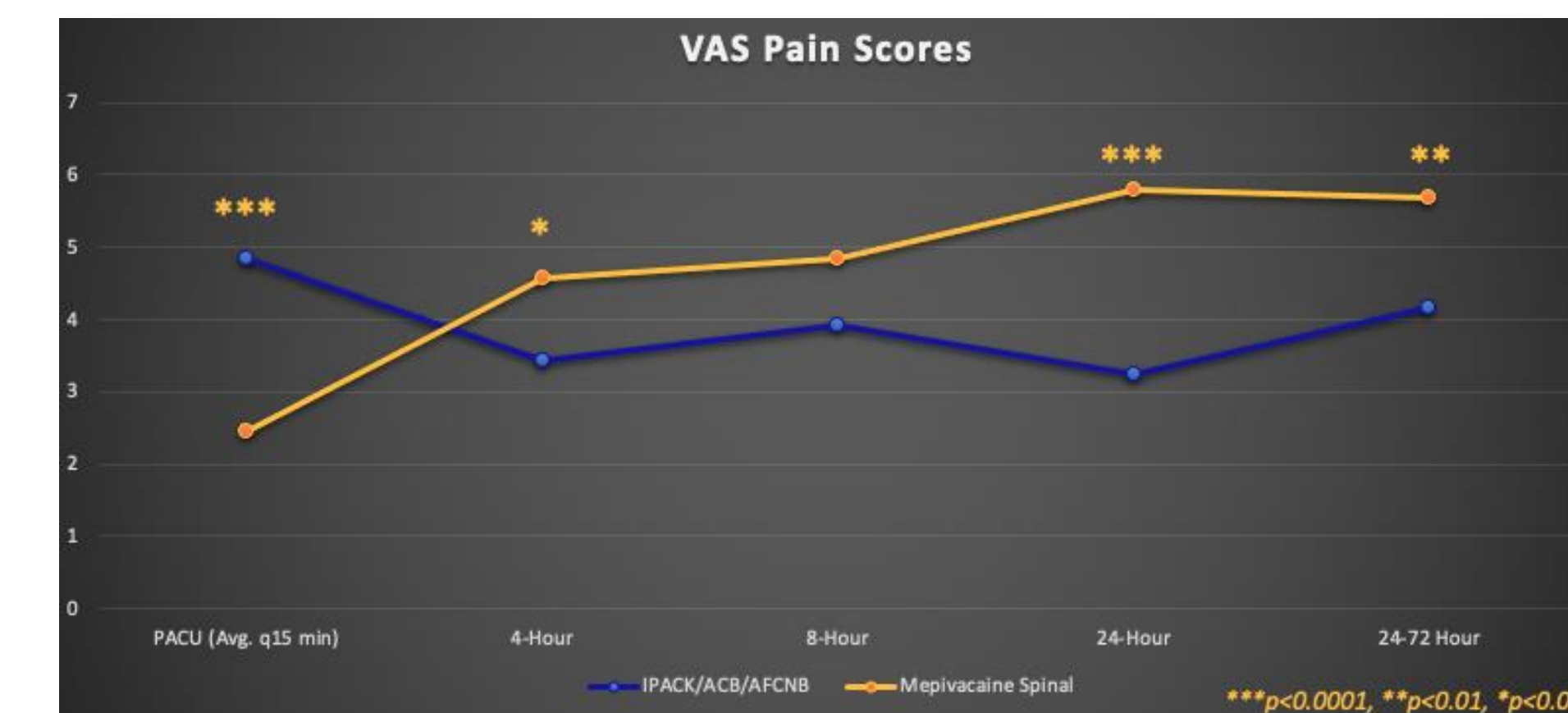
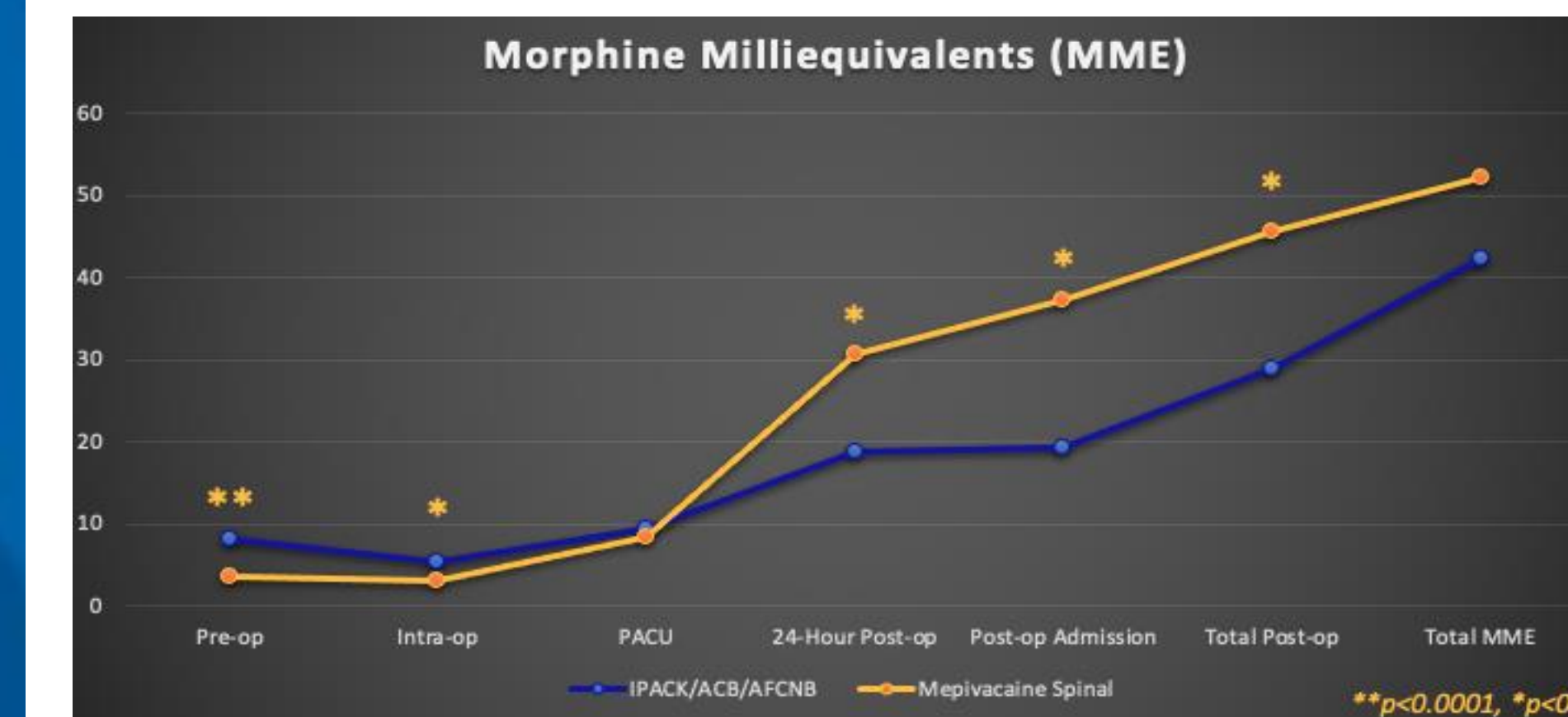
PURPOSE

- Purpose:**
 - We aimed to evaluate the feasibility of our novel anesthetic technique for primary total knee arthroplasty and compared post-operative pain and opioid consumption to mepivacaine spinal anesthetic.
- This information is helpful in identifying modalities that facilitate patient recovery after primary total knee arthroplasty

METHODS



RESULTS



Outcomes:

- Feasibility
 - 70 of 83 (84.3%) Blocks and 111 of 135 (82.3%) Spinal patients completed their intended anesthetic pathway
- Propofol Dosage (mg)
 - Bolus: 69.71 Blocks vs 48.87 Spinal, $p = 0.0246$
 - Infusion: 1186.68 Blocks vs 968.81 Spinal, $p = 0.0005$
 - Total dosage: 1256.39 Blocks vs 1017.68 Spinal, $p = 0.0002$
- Incidence of Straight Catheterization
 - 1/67 (1.5%) Blocks vs 24/111 (21.6%) Spinal, $p = 0.0001$
- Survey Responses
 - Satisfied with anesthesia: 54/55 (98.2%) Blocks vs 66/68 (97.1%) Spinal
 - Would choose the same anesthetic again: 52/55 (94.5%) Blocks vs 66/67 (98.5%) Spinal
 - Would recommend their anesthetic to a family or friend: 52/55 (94.5%) Blocks vs 65/68 (95.6%) Spinal
 - Pain controlled: 53/55 (96.4%) Blocks vs 65/68 (95.6%) Spinal
 - Numbness: 18/55 (32.7%) Blocks vs 9/68 (13.2%) Spinal, $p = 0.0094$
 - Leg weakness: 13/55 (23.6%) Blocks vs 14/68 (20.6%) Spinal
 - Participated with PT: 53/55 (96.4%) Blocks vs 68/68 (100%) Spinal

CONCLUSION

Our novel regional anesthetic protocol combined with propofol-based monitored anesthesia care (MAC) is feasible for performing primary TKA in select patients and may offer advantages when neuraxial anesthesia is undesirable.

Incidence of straight catheterization was significantly reduced in our novel regional anesthetic protocol, a complication that could result in overnight admission.

Our novel regional anesthetic protocol demonstrated greater peri-operative opioid and propofol requirements; however, this approach was associated with reduced post-operative opioid consumption and improved pain control beyond the PACU period.

This study is limited by the lack of patient randomization to anesthetic treatment groups; however, it offers practical insight into our novel regional anesthetic protocol. Prospective, randomized studies are needed to validate these findings.