

Transitioning to Chloroprocaine Spinal Anesthesia to Decrease PACU Recovery Delays in Cervical Cerclage Placement; Navigating the Challenge of Cultural Inertia in Quality Improvement

Bartłomiej Bartkowiak, MD, PhD; Kristyn Melsenti, MSN, RN, SCRNP; Anita Jegarl, BS; Ryan Brown, PharmD BCPS; Anthony Tanella, MD; Rima Aouad, MD; and Jaime B. Hyman, MD

Introduction

- Placement of cervical cerclage is often performed under spinal anesthesia
- PACU recovery stays following cerclage placement at our Hospital Outpatient Department (HOPD) averaged ~4 hours due to postoperative urinary retention
- A workgroup of nursing staff, anesthesiologists, and OB/Gyn faculty identified that a transition from bupivacaine to chloroprocaine spinal anesthesia could improve PACU discharge times

Assessment of Institutional Culture

- Email survey of Department of Anesthesiology Ambulatory Division faculty
 - Request for information regarding current practice; medication and adjuvant dosages
 - Elicit concerns regarding the use of chloroprocaine for spinal anesthesia for cerclage placement procedures
- Universal and longstanding bupivacaine use confirmed
- Primary concerns identified: Premature resolution of spinal block and formulation safety given historical issues

Addressing Barriers to Implementation

- Literature review and chart review of cerclage placement procedures from Oct 2020 - Jul 2022
 - Estimated analgesic/anesthetic rescue rate of less than 10%
- Collaboration with perioperative pharmacy; spinal formulation added to hospital formulary and other Chloroprocaine formulations reviewed
- Findings shared through division faculty meeting and one-on-one presentations
- Ob/Gyn faculty informed through outreach to leadership, presentation during operations meetings, and discussion in the ORs

Initial Trials and Results

- Trials performed on patients with reassuring airways
- 11 Chloroprocaine Spinals have been performed by multiple anesthesia clinicians
 - Significantly decreased PACU stays (~2 hours)
 - No rescue analgesia/anesthesia required inside the OR
 - Postoperative analgesic requirements appear unchanged

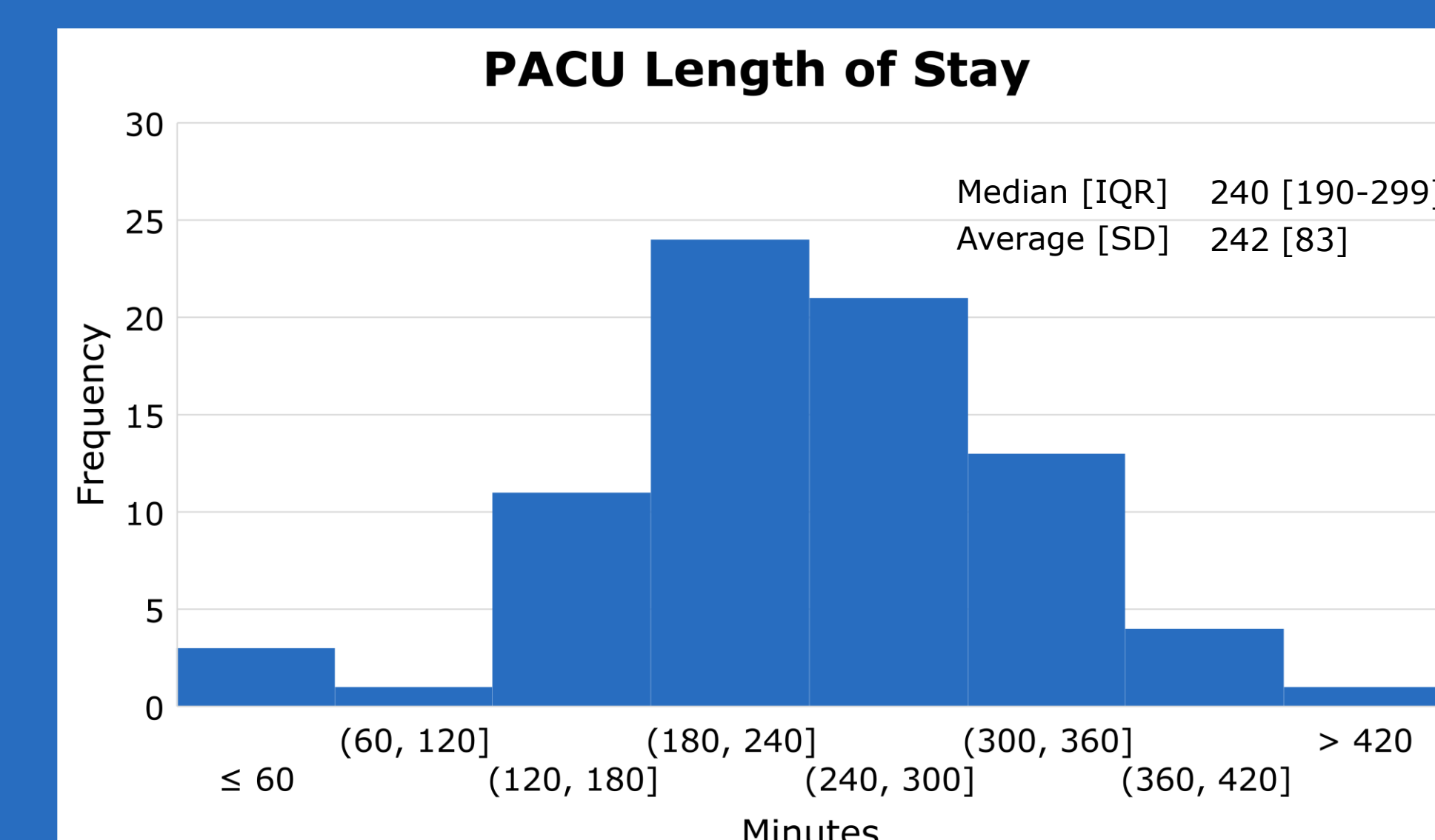
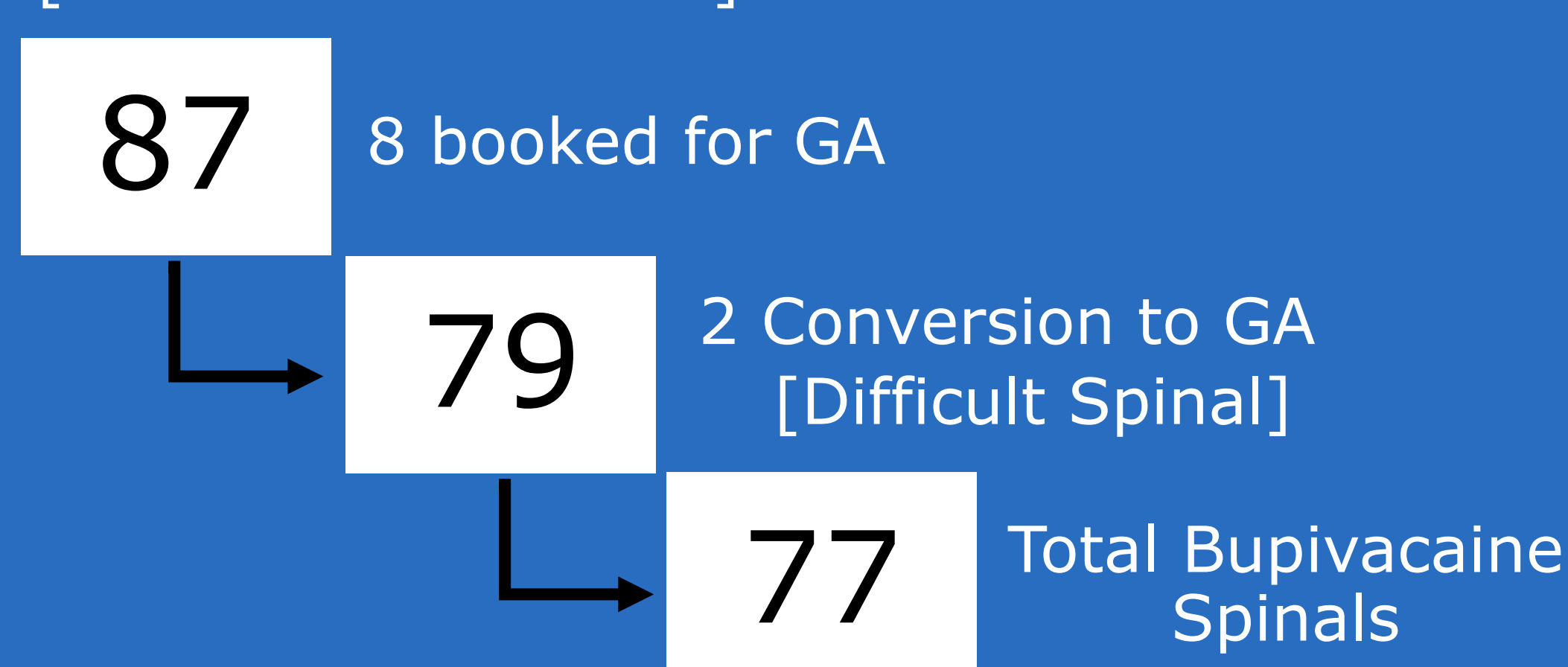
- Collaboration, communication, anticipation of challenges, and literature/internal data review can be used to implement change despite significant cultural inertia

References

1. Winnie AP, Nader AM. Santayana's prophecy fulfilled. Reg Anesth Pain Med. 2001;26(6):558-564. doi:10.1053/rapm.2001.27169
2. Mims SC, Zanolli NC, Fuller M, Habib AS. Intrathecal bupivacaine versus chloroprocaine for transvaginal cervical cerclage placement: a retrospective cohort study. Int J Obstet Anesth. 2022;50:103276. doi:10.1016/j.ijoa.2022.103276
3. Lee A, Shatil B, Landau R, Menon P, Smiley R. Intrathecal 2-Chloroprocaine 3% Versus Hyperbaric Bupivacaine 0.75% for Cervical Cerclage: A Double-Blind Randomized Controlled Trial. Anesth Analg. 2022;134(3):624-632. doi:10.1213/ANE.0000000000005653
4. Sharawi N, Tan HS, Taylor C, et al. ED 90 of Intrathecal Chloroprocaine With Fentanyl for Prophylactic Cervical Cerclage: A Sequential Allocation Biased-Coin Design. Anesthesia & Analgesia. 2022;134(4):834-842. doi:10.1213/ANE.0000000000005927
5. Schubert, A.-K., Wiesmann, T., Wulf, H., Dinges, H.-C., 2023. Spinal anesthesia in ambulatory surgery. Best Practice & Research Clinical Anaesthesiology, Spinal technique in surgery and pain management 37, 109–121. https://doi.org/10.1016/j.bpa.2023.04.002

Introduction - Cerclage PACU Stays and Anesthetics

of Cerclage Placements
[Oct 2020 - Jul 2022]



Overview of Anesthetic Agents

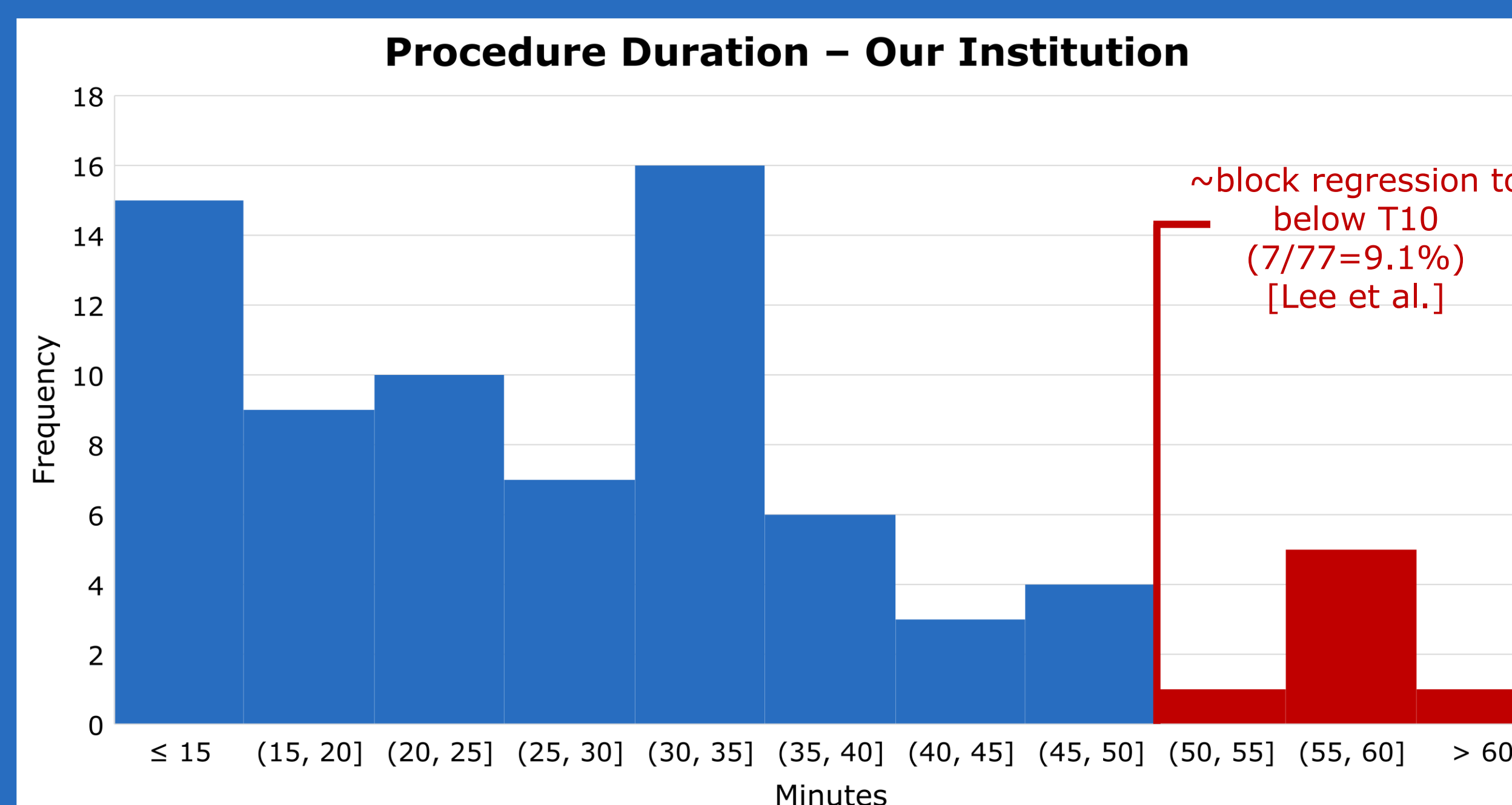
Drug	Chemical Structure	pKa	Protein Binding	Dose Range (mg)	Onset	Duration of Action (min)
2-Chloroprocaine	Ester	9.1	Unknown	30-60	Rapid	30-90
Bupivacaine	Amide	8.1	95%	5-20	Moderate	120-480

Adapted from Schubert et al., 2023

Barriers – Procedure Time and Drug Formulation

Cerclage Placement Procedure Duration

Study	Duration (Median [IQR])		Number of Patients
	Chloroprocaine	Bupivacaine	
Lee et al.	32 [25-41] min	39 [26-46] min	39
Mims et al.	15 [11-23] min	14 [11-20] min	360
Sharawi et al.	15 [10-24] min	-	45
Our Institution	-	29 [19-39]	77

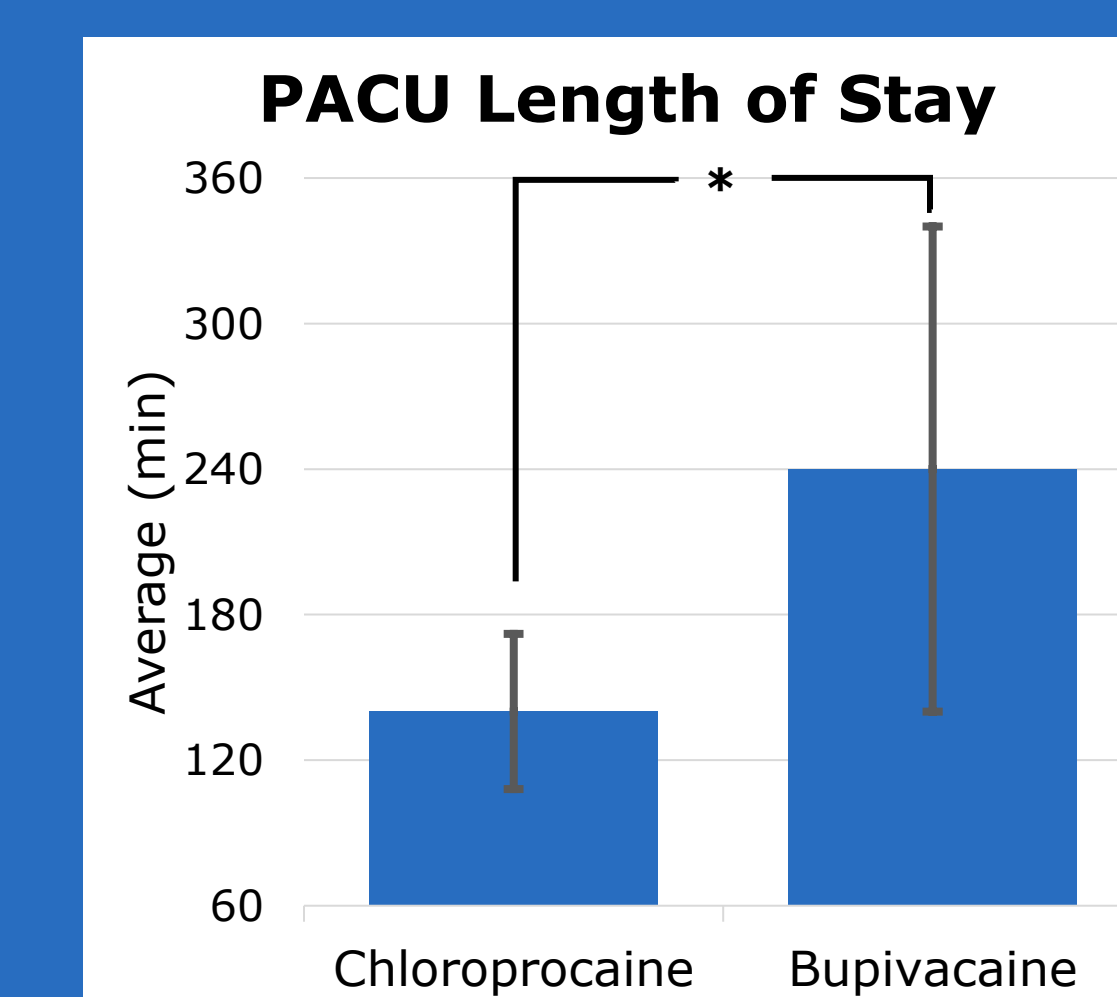


Adapted from Winnie et al., 2021

Results and Future Directions

Initial Trial Results (Jul 2022 - Feb 2024)

	Chloroprocaine n=11	Bupivacaine n=75
PACU Length of Stay		
Median [IQR]	128 [109 -159]	244 [165-307]
Average [SD]	140 [32]	240 [100]



* Welch's T-Test P=3x10⁻⁸

