

2025 ANNUAL MEETING
May 15-17, 2025
World Ballroom • Palace AC

Effect of Deep versus Moderate Neuromuscular Blockade in Reducing Postoperative Pain and Insufflation Pressure during Ambulatory Robotic Prostatectomy: A Randomized Controlled Trial

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Disclosures

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Background

- Neuromuscular blockade (NMB) with rocuronium and sugammadex reversal enables deep NMB¹ → optimize surgical conditions in robotic surgery?
- Limited and conflicting research on NMB depth and perioperative outcomes in robotic prostatectomy^{3,4}

Objective:	Hypothesis:
<ul style="list-style-type: none">• Compare deep vs. moderate NMB effects on:<ul style="list-style-type: none">• IAP• Postoperative pain• Perioperative outcomes	<ul style="list-style-type: none">• deep NMB will:<ul style="list-style-type: none">• ↓ IAP• ↓ postoperative pain• improve perioperative outcomes

1. Lee et al. Anesthesiology. 2009 May;110(5):1020-4.
2. Tobias et al. Anesthesiology. 2002 Jan;118(1):13-41.
3. Kim et al. J Clin Med. 2020 Oct;9(10):3071.
4. Wilensky et al. Br J Anaesth. 2020 Feb;124(2):168-172.

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Methods

- Prospective, single-center randomized controlled trial, n=130
- Ambulatory robotic prostatectomy patients, < 80 years, ASA I-III
- Randomized to deep vs moderate NMB

Deep NMB
TOF = 0
PTC = 1-2

Moderate NMB
TOF = 1-2


- Monitoring: quantitative Neuromuscular Transmission (NMT) device (GE Healthcare)

Source: <https://www.intuitive.com/en-us/robotic-surgery/robotic-assisted-prostatectomy>

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Outcomes & Analysis



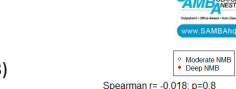
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MEDICINES**
Painless • Pleasant • No Opioids • No
Sedation • No Side Effects • No
Addiction • No Dependence • No
Withdrawal • No Tolerance • No
Respiratory Depression • No
Nausea • No Constipation • No
Urinary Retention • No
Hypotension • No
Bradycardia • No
Hypothermia • No
Hyperkalemia • No
Hypocalcemia • No
Hypomagnesemia • No
Hypophosphatemia • No
Hypokalemia • No
Hypoglycemia • No
Hypothermia • No
Hyperkalemia • No
Hypocalcemia • No
Hypomagnesemia • No
Hypophosphatemia • No
Hypokalemia • No
Hypoglycemia • No

- Primary Outcomes
 - IAP
 - Postoperative pain
- Secondary Outcomes
 - Surgical conditions, intraoperative opioids, operating time, EBL, PONV, shoulder pain
- Linear mixed effects model adjusted for:
 - BMI, surgeon-level random effects
- Quantitative NMT monitor challenges
 - Secondary exploratory analysis

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Results

- Deep NMB (n=67), Moderate NMB (n=63)
- Primary outcomes
 - 1% lower IAP in deep group (p=0.5)
 - 25% lower postop pain in deep group (p=0.2)
→ **neither statistically significant**
- Secondary Outcomes
 - No significant differences except intraoperative IV MME (-0.9 in deep; p=0.048)
- Exploratory Analysis (presented separately)
 - Findings comparable to primary analysis



The scatter plot displays the relationship between Intra-Arthral Pain (IAP) Area Under the Curve (AUC) on the y-axis and Postoperative Pain (Pain) Area Under the Curve (AUC) on the x-axis. The y-axis ranges from 8 to 16, and the x-axis ranges from 0 to 10. Data points are categorized by NMB level: Moderate NMB (open circles) and Deep NMB (red circles). A legend in the top right corner identifies these groups. A Spearman correlation coefficient is noted as $r = -0.018$ and $p = 0.8$. A horizontal dashed line is drawn at IAP AUC = 11.5.

Spearman $r = -0.018$, $p = 0.8$

IAP AUC

Pain AUC

Legend:
○ Moderate NMB
● Deep NMB

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Conclusions & Future Directions

- Quantified deep NMB had no effect on IAP, postoperative pain & all but one secondary outcome
- Low overall need for analgesics/antiemetics
- Explore in other surgical populations
- Technical challenges with quantitative NMB monitoring (presented separately)
- Studies using newer-generation monitors warranted



THANK
YOU

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