The POUR Decision: Sugammadex vs. Traditional Reversal Agents

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INTRODUCTION

Background
Post-operative urinary retention (POUR) is a common complication after general anesthesia, with reported incidence ranging from 5% to 70% depending on patient, surgical, and anesthetic factors (Baldini et al., 2009; Pomajzl & Siref, 2023). POUR—defined as inability to void despite a full bladder—can lead to discomfort, bladder overdistention, catheter-associated UTIs, and prolonged hospitalization.

ICU nurses' observations prompted the PACU professional governance team to investigate whether neuromuscular blockade (NMB) reversal choice influences POUR rates in thoracic surgery patients. Traditional reversal with neostigmine and glycopyrrolate can impair detrusor contractility via parasympathetic inhibition, increasing retention risk. Sugammadex, which reverses aminosteroid NMB without anticholinergics, may lower POUR incidence; Cha et al. (2018) found significantly fewer cases compared to neostigmine/glycopyrrolate.

This retrospective chart review was approved by the IRB and Nursing Research/EBP Council.

Purpose
To determine whether sugammadex, compared to neostigmine/glycopyrrolate, reduces the incidence of POUR in thoracic surgery patients under general anesthesia through a retrospective chart review.

Framework:
Guided by the Roy Adaptation Model, focusing on physiological adaptation in the postoperative period, using a quantitative retrospective chart review to evaluate outcomes.

Objectives of Poster:
Identify reversal agents used in general anesthesia, understand postoperative urinary retention, and assess the correlation between sugammadex use and reduced POUR.

METHODS

Setting and Participants:
Patients that underwent thoracic surgery at Virtua Marlton Hospital from 1/1/24-5/31/25.

Inclusion Criteria	Exclusion Criteria
Adults >50 years old	Pre-existing chronic urinary retention
Underwent thoracic surgery under general anesthesia	Pre-existing neurogenic bladder
Received a non-depolarizing neuromuscular blocker (ex: rocuronium, vecuronium)	Pre-existing postoperative urinary retention
Received either sugammadex or neostigmine/glycopyrrolate as reversal agent	End-stage renal disease requiring dialysis
Medical record contains documentation of spontaneous void, urinary catheter use, or urinary retention status within 24 hours postoperatively	Incomplete records for anesthesia or postoperative outcomes

Intervention/Process:
Data collection tool to track de-identified patient data:
- Analyze anesthesia record to determine which reversal agent.
- Determine first postoperative void: spontaneous, intermittent straight catheterization, or indwelling urinary catheter.

Data Collection and Analysis:
Data collection tool of de-identified patient data to log:

Data Collection:
1. Patient #
2. Surgery
3. Reversal agent
4. Age
5. Sex
6. Spontaneous void
7. Bladder scan
8. Bladder scan ml
9. Indwelling catheter or straight catheter
10. Voided ml
11. Time of first postoperative void
12. Urological history
13. Surgeon
14. Block
15. Meets inclusion criteria
16. Meets exclusion criteria

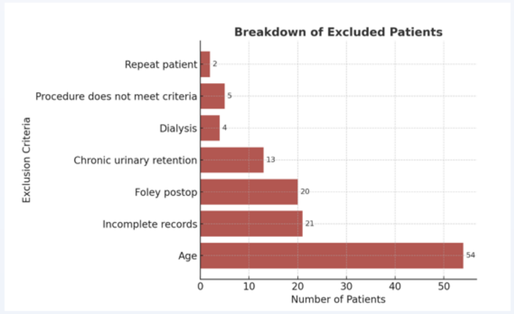
Analysis:
Chi-square test will assess the association between reversal agents and incidence of POUR.

RESULTS

Key Findings:
Patient total: 239:
Included patients: 120

Reversal Agent Group	POUR (+)	POUR (-)	Total
Glycopyrrolate/Neostigmine	6	15	21
Sugammadex	11	82	93
All 3 agents	2	4	6
Total	19	101	120

Excluded patients: 119



Actionable Data:
Based on the data collected from 1/1/2024-5/31/25, the sample size for the patient population that received glycopyrrolate and neostigmine is much smaller than the patient population that received sugammadex. An IRB revision application was submitted to analyze data from 2022 and 2023 to investigate if there is a larger sample size for the patient population that received glycopyrrolate and neostigmine.

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CONCLUSIONS

Interpretation:
$\chi^2(2, N=120) = 5.06$, $p = 0.080$.
- Chi-square statistic: 5.06
- Degrees of freedom: 2
- p-value 0.080

Since **p = 0.080** is greater than 0.05, the result is not statistically significant at the conventional 5% level. Meaning, the null hypothesis cannot be rejected. The data collected does not show a statistically significant association between reversal agent group and POUR.

Relevance:
At this time, there is not enough data to determine if the use of sugammadex prevents postoperative urinary retention. Pending IRB approval, a second retrospective chart review will examine thoracic surgery cases from 2022 and 2023 to collect a larger sample size.

Limitations and Future Directions:
Next steps include submitting IRB Modification form with updated protocol to include patients that underwent thoracic surgery in 2022 and 2023. The same data collection tool will be used as well as the same research framework and analysis.

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