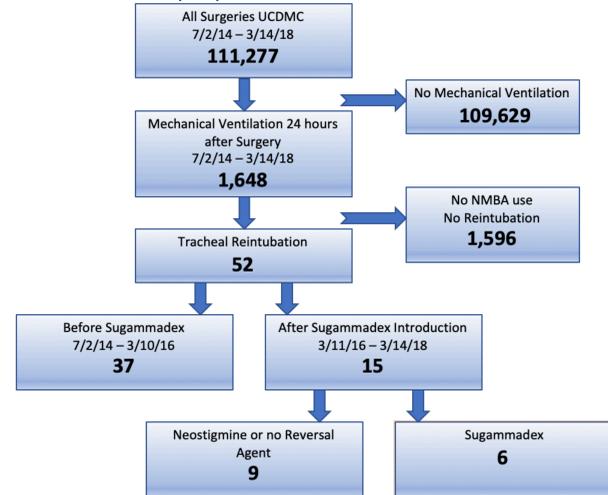


# EVALUATION OF REINTUBATION RATES FOLLOWING INTRODUCTION OF NEW REVERSAL AGENT

Presenter: Colton Soudan

## Background

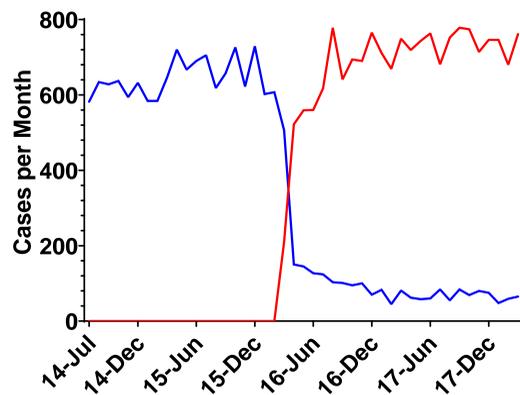
- Postoperative residual neuromuscular blockade is associated with post-op complications
- Current blockade reversal agents are Sugammadex and Neostigmine
- Sugammadex may decrease postoperative residual neuromuscular blockade
- Sugammadex was introduced to UC Davis Academic Center on 3/11/16



## Methods

- Used EMR and chart review to find patients requiring post-operative tracheal reintubation
- Observed previously associated patient characteristics, as well as new factors, as shown in table 1 and 2

### Reversal



## Results

- 52 patients required tracheal reintubation; 37 before and 15 after Sugammadex
- Significant decrease in the frequency of tracheal reintubations comparing the post-Sugammadex introduction to the pre-Sugammadex introduction group
- Significant decrease in frequency of reintubation comparing Sugammadex to Neostigmine *within* Post-Sugammadex introduction group

# Following the introduction of Sugammadex, post-operative tracheal reintubation frequency *decreased* at UC Davis Medical Center



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|  | Pre-Sugammadex<br>7/2/14-3/10/16 | Post Sugammadex<br>3/11/16-3/14/18 |
|--|----------------------------------|------------------------------------|
| Dates  | 7/2/14-3/10/16                   | 3/11/16-3/14/18                    |
| Total Non-depolarizing NMBA Use  | 23,533                           | 30,742                             |
| Total Patients Requiring Tracheal Reintubation                                 | 37                               | 15                                 |
| Frequency of Tracheal Reintubations  | 0.16%*                           | 0.05%*                             |
| Reintubations per Month  | 1.8                              | 0.6                                |
| Patient Characteristics for Reintubations                                      |                                  |                                    |
| Average Age  | 56.9                             | 51.9                               |
| Age Range  | 3 to 83                          | 3 to 83                            |
| Age SD   | 18.84                            | 22.13                              |
| Gender   | 21F; 16M                         | 7F; 8M                             |
| Average BMI  | 27.81                            | 28.51                              |
| Weight (kg)  | 73.94                            | 77.17                              |
| Number of patients with HF   | 6                                | 5                                  |
| Number of Patients with COPD   | 9                                | 6                                  |
| Number of Patients with CKD  | 5                                | 6                                  |
| Number of patients with Intra-abdominal Surgery                                | 18                               | 5                                  |
| ASA Classification 1 / 2 / 3 / 4   | 0 / 1 / 17 / 19                  | 1 / 0 / 12 / 2                     |
| Time of Surgery: 0-2 / 2-4 / 4+ Hours  | 18 / 12 / 7                      | 8 / 4 / 3                          |
| Average Neuromuscular Blockade Agent Rocuronium Equivalent mg/kg               | 1.2                              | 1.2                                |
| Number of Patients reversed with Neostigmine                                   | 34                               | 6                                  |
| Number of Patients reversed with Sugammadex                                    | 0                                | 6                                  |
| Number of Patients not given Reversal Agent                                    | 3                                | 3                                  |
| Average Reversal Agent Neostigmine mg/kg                                       | 0.06                             | 0.05                               |
| Average Reversal Agent Sugammadex mg/kg  |                                  | 2.9                                |
| Average time from Reversal Agent to Reintubation                               | 1:12                             | 1:21                               |
| Average time from last NMBA to RA  | 1:16                             | 1:22                               |
| Number of Patients that desaturated <90% following initial tracheal intubation | 5                                | 5                                  |

\*= P-value <.01 when compared

## Discussion

- Further research can explore how different patient and surgical characteristics can impact the frequency of tracheal reintubations
- Further research can examine patient population not receiving neuromuscular blockade reversal agent
- Further research could look at 30 day outcomes following tracheal reintubation

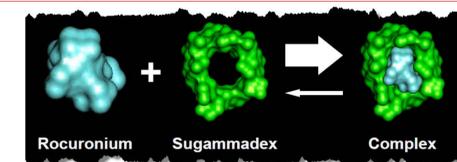
|  | Neostigmine<br>3/11/16-3/14/18 | Sugammadex<br>3/11/16-3/14/18 |
|--|--------------------------------|-------------------------------|
| Dates  | 3/11/16-3/14/18                | 3/11/16-3/14/18               |
| Total Patients Receiving RA Post-Sugammadex Introduction                       | 4,455                          | 19,379                        |
| Total Patients Requiring Tracheal Reintubation                                 | 6                              | 6                             |
| Reintubations per use of RA Post-Sugammadex Introduction                       | 0.13%*                         | 0.03%*                        |
| Patient Characteristics for Reintubations                                      |                                |                               |
| Average Age  | 62.7                           | 41.3                          |
| Age Range  | 44 to 74                       | 3 to 83                       |
| Age SD   | 14.14                          | 29.76                         |
| Gender   | 4F; 2M                         | 2F; 4M                        |
| Average BMI  | 31.08                          | 27.13                         |
| Weight (kg)  | 85.82                          | 61.97                         |
| Number of Patients with HF   | 1                              | 1                             |
| Number of Patients with COPD   | 2                              | 2                             |
| Number of Patients with CKD  | 5                              | 1                             |
| Number of patients with Intra-abdominal Surgery                                | 4                              | 1                             |
| ASA Classification 1 / 2 / 3 / 4   | 0 / 0 / 6 / 0                  | 1 / 0 / 3 / 2                 |
| Time of Surgery: 0-2 / 2-4 / 4+ Hours  | 3 / 1 / 2                      | 4 / 2 / 0                     |
| Average Neuromuscular Blockade Agent Rocuronium Equivalent mg/kg               | 1.4                            | 1.2                           |
| Number of Patients reversed with Neostigmine                                   | 6                              | 0                             |
| Number of Patients reversed with Sugammadex                                    | 0                              | 6                             |
| Average Reversal Agent mg/kg   | 0.05                           | 2.9                           |
| Average time from Reversal Agent to Reintubation                               | 0:55                           | 1:48                          |
| Average time from last NMBA to RA  | 1:26                           | 1:18                          |
| Number of Patients that desaturated <90% following initial tracheal intubation | 2                              | 2                             |

\*=P-value <.00001 when compared

## References

1. Hristovska AM, Duch P, Allingstrup M, Afshari A. Efficacy and safety of sugammadex versus neostigmine in reversing neuromuscular blockade in adults. *Cochrane Database Syst Rev.* 2017;8
2. Brueckmann, Britta, et al. "Development and Validation of a Score for Prediction of Postoperative Respiratory Complications." *Anesthesiology*, vol. 118, no. 6, 2013, pp. 1276-1285.
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