
# 2020 CAS Annual Meeting

## Economics

## (Abstracts)

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## Reducing Acute Hospitalization Length of Stay after Total Knee Arthroplasty: A Quality Improvement Study

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**Introduction:** Total knee arthroplasty (TKA) is an effective surgery to manage end-stage arthritis of the knee. For TKA, acute hospitalization length-of-stay (LOS) is the largest independent driver of costs and is frequently used as a measure of quality of care[1,2]. Studies investigating enhanced recovery after surgery (ERAS) programs for TKA have demonstrated excellent cost savings[3] and reduced LOS[4]. Such programs focus on improving pain management, minimising post-operative nausea and vomiting (PONV), early mobilization and enhancing patient education[5]. ERAS programs are designed to minimise variability in care and are developed in accordance with evidenced-based best practice.

**Objectives:** At our institution, LOS was identified as a key target for improving patient outcomes and minimising costs.

Methods: A root-cause-analysis was performed over a 12-month period by a multidisciplinary team of care providers to elucidate factors impacting patient recovery and discharge for elective TKA patients. Postoperative pain, PONV, delays to early mobilization due to bladder catheters, and lack of patient education for discharge home were identified as areas for improvement.

Four interventions were chosen as part of the ERAS bundle based on literature review and feasibility analysis.

- Placement of peri-operative adductor canal blocks in addition to the standard multimodal analgesia regime
- Administration of 0.1 mg/kg Dexamethasone perioperatively
- Avoidance of routine pre-operative Foley catheterization
- Pre-operative patient education to prepare for discharge on POD1

The primary outcome was acute hospital LOS. Secondary outcomes were percentage of patients discharged to inpatient rehabilitation, 24-hour opioid consumption, maximum Verbal Rating Scale score and presence of PONV in the first 24 hours. Implementation of the ERAS bundle was successfully achieved using educational rounds, training workshops, and continuous project team engagement with care providers.

Baseline data for our pre-intervention period was collected from January 2017 to December 2017. Data for the implementation period was collected from January 2018 to August 2019.

Institutional research ethics board approval was granted for a retrospective chart review.

**Results:** The pre- and post-intervention groups included 232 and 383 patients respectively. Mean acute hospitalization LOS decreased from 2.82 days to 2.13 days for a net difference of 0.69 days per patient ($p<0.001$). The percentage of patients discharged to inpatient rehabilitation decreased from 20.2% to 10.7% ($p<0.001$). For secondary outcome measures, mean 24-hour oral morphine consumption decreased from 60 mg to 38 mg for a net difference of 22 mg ($p<0.001$). 24-hour PONV rates decreased from 51.7% to 36.6%. Bladder catheterization rates decreased from 97.0% to 37.3% ($p<0.001$). 30-day ED visits following discharge decreased from 12.9% to 7.3% ($p=0.030$).

**Conclusion:** Our findings provide a framework for individualized root cause analysis and a multifaceted, patient-centered intervention bundle with the potential to enhance patient recovery and decrease acute hospitalization LOS.

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## Sugammadex Usage in St. John's, NL (2016-2019)

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**Introduction:** Sugammadex is a newer neuromuscular blocking agent that has been available in Canada since April 2016. It is a fast acting reversal agent for the specific reversal of the neuromuscular blocking agent Rocuronium. Sugammadex has been on the drug formulary in St. John's, with unrestricted access to its use, since April 2016. We examined the usage of sugammadex over a three-year period from April 1, 2016 to March 31, 2019 at the two adult hospitals in St. John's Newfoundland.

**Objectives:** We wanted to ascertain the usage and cost of sugammadex being utilized in two adult hospitals. The cost per dose of sugammadex is approximately $100, which is 10 X the cost of the more traditional reversal agent Neostigmine/Glycopyrolate. We assessed what types and length of cases were most likely to have sugammadex used in. We also assessed different anesthesia providers for the use of sugammadex.

**Methods:** Ethics approval was obtained from the local REB. All general anesthesia cases that required muscle relaxation with the neuromuscular blocking agent rocuronium between April 1, 2019 and March 31, 2019 were analyzed. These cases were collated and filtered for those that used sugammadex for reversal versus those that utilized Neostigmine. We also collected data showing which providers utilized sugammadex. Surgical cases were divided into specialty as well as length of time of the procedure (<1hour,1-2 hours and >2 hours).

**Results:** During the study period there were 19295 cases performed that used rocuronium and a reversal agent. Of this number 1834 cases were reversed with sugammadex (9.5%). Yearly numbers showed a significant increase in sugammadex usage (Year 1 3.56%, year 2 9.23% and Year 3 15.07% of total cases). The specialties that used the most sugammadex were General Surgery 586 (31%), ENT/oral surgery 478 (25%), Orthopedics 227 (12%) and Thoracics 199 (11%). There was no significant difference in usage when looking at the length of cases. It was found that one hospital used significantly more sugammadex than the other and that of the top 10 users, 8 were from this site. One provider was responsible for 13% of the Sugammadex usage.

**Conclusion:** Sugammadex is a relatively new drug used for the rapid reversal of neuromuscular blockade due to rocuronium. We found that there has been a steady increase in the use of sugammadex in St. John's resulting in its use in 9.5% of all cases requiring reversal during the study period. Its use is more prevalent at one adult site compared to the other. Some anesthetists use sugammadex significantly more than their peers. The total cost of Sugammadex used in St. John's during this study period was $197,777 based on milligrams used.