Use of Provider Education, Intra-Operative Decision Support, and an Email-Feedback System in Reducing the Overuse of Sugammadex: A Quality Improvement Effort

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Background: Although sugammadex has many clinical benefits compared to neostigmine in reversing deep muscular blockade, it is expensive. Our academic medical center sought to reduce its sugammadex expenditures by decreasing the number of cases requiring high-dose sugammadex (>200 mg). We implemented dosing guidelines calculated with adjusted body weight and developed informatics-based tools to encourage provider adoption of these guidelines.

Methods: In November 2018, we educated our anesthesia providers on our new adjusted body weight-based dosing guidelines. In addition, we provided them with intra-operative decision support which displayed a patient's actual and adjusted body weights as well as a dashboard which monitored their own rates of high-dose sugammadex administration. In April 2019, we implemented an email-feedback system which reminded providers of the new guidelines. We assessed rates of high-dose sugammadex administration in three phases: Pre-intervention (May 2018 to November 2018); First Intervention (November 2018 to April 2019); and Second Intervention (April 2019 to July 2019).

Results: The mean rate of high-dose sugammadex during the pre-intervention phase was 12.88% compared to 4.54% in the first-intervention phase and 3.18% in the second-intervention phase. Segmented regression analysis (see **Figure 1**) demonstrated a significant level change — β_2 — of -3.51% (95% CI: -5.64%, -1.38%; P = .002) after provider education and the implementation of our digital improvement initiatives. Segmented regression analysis did not reveal an additional significant trend reduction — β_3 — after the First Intervention, but it revealed no rebound effect either. Furthermore, our analysis did not reveal significant level or trend changes — β_4 and β_5, respectively — after our implementation of an email-feedback system, but we hypothesize this system contributed to maintaining sustained low rates of high-dose sugammadex administration. Overall, our interventions yielded an absolute savings of $23,631 per month and a relative savings of 68.7% per month.

Conclusion: Provider education and digital quality improvement efforts were effective in reducing the rate of high-dose sugammadex administration, maintaining this reduced rate over time, and generating real cost savings at a large academic medical institution.

(Figure 1 is on next page)
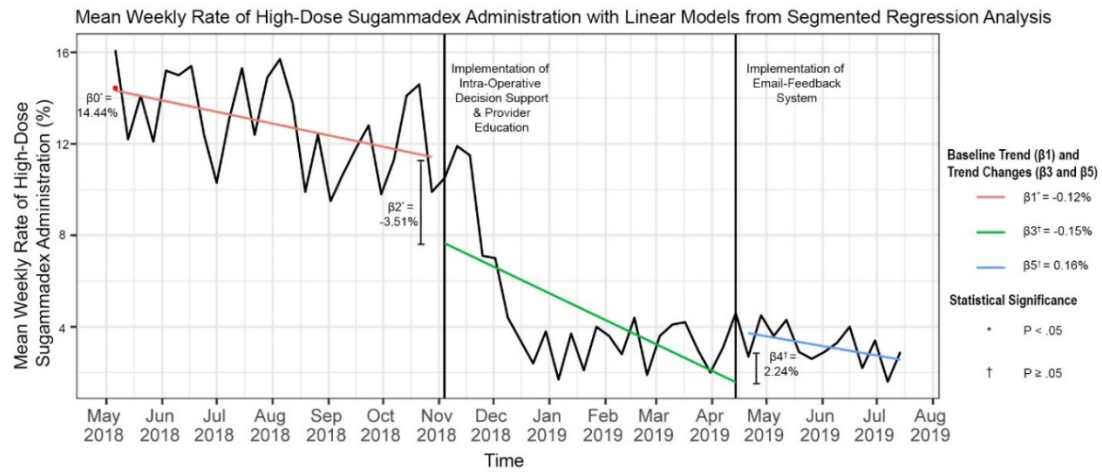
Figure 1: Results from segmented regression analysis