

Use of an Automated Cost Calculator to Quantify Anesthetic Cost Interventions

Presenting Author: Jonathan Wanderer, MD, MPhil, Departments of Anesthesiology and Biomedical Informatics

Co-Authors: Ariana Tabing, BS, Vanderbilt University School of Medicine, Jesse Ehrenfeld, MD, MPH, Departments of Anesthesiology, Biomedical Informatics, Health Policy and Surgery

Introduction: Controlling healthcare expenditures has become increasingly important in today's healthcare environment, and anesthetic-related drug costs are now precisely measurable using data collected by anesthesia information management systems (AIMS). AIMS have led to case-specific and provider-specific cost feedback and allowed the implementation and evaluation of various cost containment strategies. Remifentanyl, dexmedetomidine, and desflurane, are costly agents that often have suitable alternatives to their use. We implemented interventions that limited desflurane, remifentanyl, and dexmedetomidine availability. We sought to identify changes in cost and process outcomes following these interventions.

Methods: We calculated volatile and intravenous drug costs for all operating room procedures performed five months before and after the accessibility interventions through AIMS. We analyzed age, gender, American Society of Anesthesiologists (ASA) classification, body mass index, procedure type, anesthesia technique, attending anesthesia provider, case duration, and out of room times. We retrospectively compared drug costs per case and frequency of agent use before and after the interventions. Wilcoxon-Mann-Whitney and Chi Square analysis were used to quantify the cost and use differences between time periods.

Results: 27,233 surgical cases were identified, and 26,953 were analyzed. Mean anesthetic drug costs were significantly lower ($p < 0.0001$) after the interventions at \$21.44 compared to \$32.39 before, a cost savings of \$10.95 (95% CI \$9.86 to \$12.04). The percentage of cases using remifentanyl was significantly lower (3.5% vs 9.2%, $p < 0.0001$). Use of dexmedetomidine did not significantly differ (0.4% vs 0.5%, $p = 0.07$). The percentage of cases using desflurane was significantly lower (0.6% vs 20.2%, $p < 0.0001$). There was no significant relationship between the interventions and the frequency of cases with delayed out of room times (greater than 15 minutes after end of case).

Conclusions: An automated cost calculator permitted quantification of these cost interventions and allowed analysis and feedback of these data. Reducing the accessibility of cost-prohibitive agents resulted in significant cost savings and decreased usage without delaying transfer to the recovery room.