

Cost Savings from the Implementation of Low-Flow Anesthesia

Todd Glenski, MD MSHA & Laura Levine, MD

Department of Anesthesiology, Children's Mercy Hospital, Kansas City

Introduction & Methods

- Our pediatric hospital provides over 25,000 anesthetics a year. A QI project is underway to transition the current practice of delivering at least 2L fresh gas flow (FGF) during a sevoflurane anesthetic to low-flow anesthesia in order to reduce hospital costs and greenhouse gas emissions.
- Dräger Perseus® A500 machines have “Low-Flow Wizard” to accurately provide low FGF.
- We use Litholyme CO2 absorbents designed for low-flow anesthesia that produce no compound A.
- Over six weeks, data was collected from 20 IV induction laparoscopic appendectomies.
- For the current practice technique, the anesthesia provider used their “normal” FGF with sevoflurane.
- For the low-flow technique, the anesthesia provider used the “Low-Flow Wizard” to safely deliver less than 2L FGF with sevoflurane.
- After each procedure, we recorded the volume of sevoflurane used from the Dräger Perseus® A500 Consumption Tab and the duration of use (minutes).

Low-Flow Cost Analysis

Flows	Average Amount of Sevo Used (cc)	Average Duration of Use of Sevo (min)	Cost/min (\$)
Normal Flow (2L or more), n=10	21.2	34.7	\$0.38
Low Flow (<1L), n=10	9.18	36	\$0.16
t-test for average: Two Sample Assuming Equal Variances	P(T<=t) one-tail = .002	P(T<=t) one-tail =0.42	P(T<=t) one-tail =0.0003

Table 1: Average volume and duration of sevoflurane during 20 IV induction laparoscopic appendectomies to compare cost/min of current practice versus low-flow anesthesia.

Cost-Savings		
Average Cost per Year of Sevoflurane for 2017 & 2018	Potential Percentage Decrease in Sevoflurane Use	Savings Per Year
\$313,068	57%	\$178,448

Table 2: Potential cost savings from low-flow anesthesia

Results & Conclusion

- The volume of sevoflurane used was significantly lower in the low-flow anesthesia group ($p<.005$) (Table 1), with a mean decrease of 57%.
- The mean duration of sevoflurane use was not significantly lower in the low-flow group ($p=.42$).
- The cost per minute of sevoflurane was significantly lower in the low-flow group ($p<.0005$).
- Based on our average total cost of sevoflurane during the prior two years, the potential cost savings could be over \$170,000 a year (Table 2).
- Our QI initiative aimed at changing the current practice of >2L FGF to low-flow anesthesia has the potential for significant cost savings for the hospital.
- The environmental impact of low-flow anesthesia has the potential to be significant, albeit difficult to measure.
- With new anesthesia machines and CO2 absorbers, low-flow anesthesia has the potential for substantial financial and environmental benefits compared to the current practice.