

Mitigating the Impact of Inhaled Anesthetics on Carbon Emissions

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Purpose

- To reduce the utilization of environmentally harmful inhaled anesthetic agents

Objectives:

- Increase CRNA utilization of environmentally safer inhaled anesthetics
- Increase CRNA utilization of low fresh gas flow (FGF) & alternative anesthetic agents
- Improve CRNA knowledge of anesthetic choices & carbon footprint

Background & Research

- Volatile anesthetics act as greenhouse gases in Earth's atmosphere ^{2,3,9,10}
- 10%** of national greenhouse gas emissions come from healthcare ^{4,7}
- CRNAs administer **50 million** anesthetics per year in the U.S. alone ¹
- Low FGF & (TIVA) decrease inhaled anesthetic use, shorten PACU times, & prevent PONV ^{5,6,8}



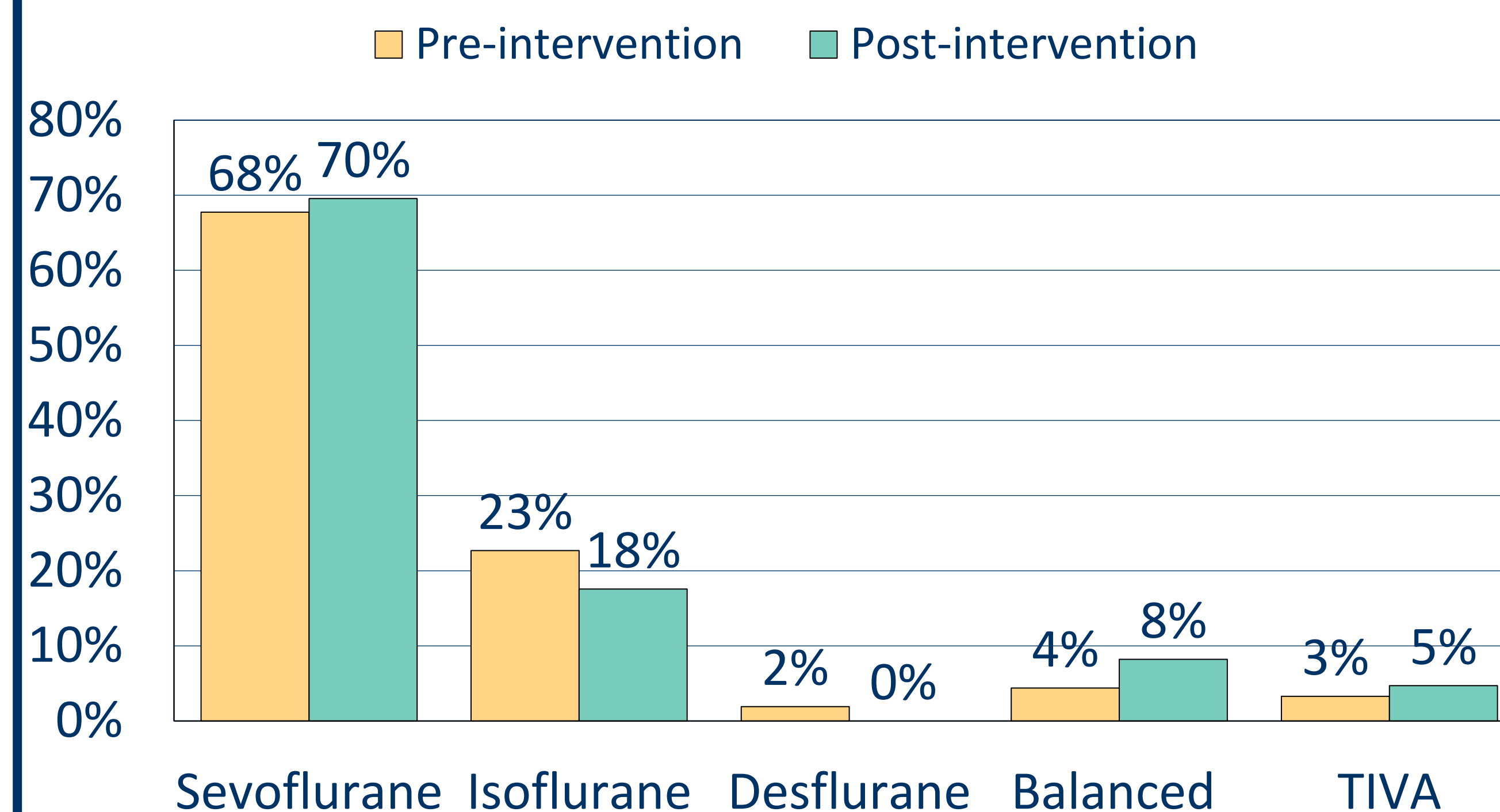
Methods

- Anesthesia data collected from 20 ORs over 2-weeks at North Carolina Level II trauma center
- CRNA pre-intervention survey on knowledge of carbon emissions & willingness to adopt alternative anesthesia techniques
- Evidence-based educational intervention for CRNAs on anesthetic choices & implications
- Post-intervention data collection & surveys repeated to assess for interval change

Results

- Increased knowledge of carbon emissions associated with anesthetic agents
- 65%** decrease in total carbon footprint
- 4%** increase in balanced anesthesia selection
- 2%** increase in TIVA selection
- 0%** decrease in N2O selection, but **13%** decrease in total utilization in minutes

Anesthetic Agent Selection



Discussion

- Post-intervention CRNA anesthetic agent selection, & lower FGF rates correlated with increased knowledge

Average Fresh Gas Flow Rate (L/min)

	Pre-intervention	Post-intervention
Sevoflurane	2.2	2.1
Isoflurane	1.9	1.7
Desflurane	1.7	0
Balanced	2.9	2.4

Conclusions

- An educational intervention can lead to environmentally safer anesthetic choices & decrease carbon emissions
- Over 1 year, this change could decrease carbon emissions by **148,446 kgCO₂eq** which is equal to **380,549 miles** driven by passenger vehicles

Suggestions for Future Research:

- Improve Anesthetic Agent Selection:** Emphasize safety & benefits of alternate anesthetic techniques
- Increase Knowledge & Overcome Barriers to Change:** extend to all anesthesia providers

References

