

**Abstract Title:** The Effects of Education Initiatives and Anesthetic Gas Monitoring on Operating Room Greenhouse Gas Emissions

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**Background/Introduction:**

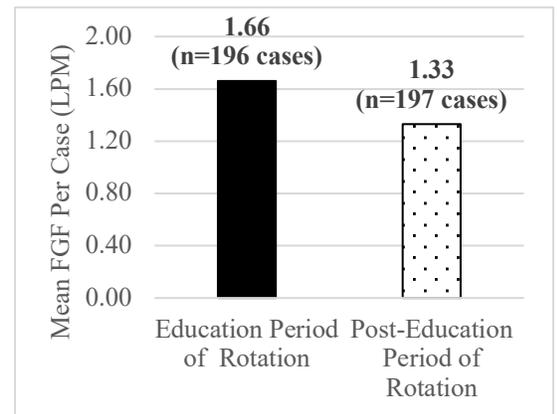
Volatile anesthetics have a markedly higher global warming potential than CO<sub>2</sub> (desflurane>isoflurane>sevoflurane). Providing anesthesia with a lower fresh gas flow (FGF) will lower the amount of waste anesthetic gas (WAG) emitted into the atmosphere. This project evaluated the success of providing anesthesia residents at the Zablocki VA Medical Center with weekly education and electronic feedback on the environmental impact of their own practice.

**Methods:**

Resident FGF, case duration and volatile anesthetic choice were extracted from the electronic record for thirteen 4-week rotations of the 2020-2021 academic year. Each rotation was divided into two consecutive 2-week periods: education period and post-education period. For the education period, residents were sent an email each week with general strategies to reduce their WAGs (e.g., use environmentally-friendly FGF  $\leq 1$  LPM), along with their own FGF data (compared to that of their peers) and environmental impact data. In the post-education period, they were again sent their own FGF data (compared to that of their peers) and environmental impact data to evaluate the effectiveness of the educational intervention.

**Results:**

- 1) 39 residents were present for the entire 4-week rotation and 33 (85%) reduced their mean FGF per case between the education period and post-education period (20% reduction), contributing to a 25% reduction in mean metric tons of CO<sub>2</sub> equivalents generated from WAGs per case.
- 2) 8 residents returned to the VA for another rotation at a later date and 4 (50%) started this second rotation using a lower mean FGF per case than at the start of their first rotation (14% lower), suggesting a longer-term adoption of an environmentally-friendly practice.



**Conclusion:**

Resident education and electronic feedback can successfully change both short- and long-term anesthesia practices to the benefit of the environment, as evidenced by a reduction in FGF and WAGs. It should be noted that the residents evaluated were not able to achieve the environmental standard of  $\leq 1$  LPM for mean FGF per case, suggesting that further education and feedback may be necessary.

**Figure 1.** Mean FGF per case of the 33 anesthesia residents who reduced their FGF between the education period and the post-education period of their first rotation at the VA.