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The Devil Is in the Detail

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In reply

We thank Dr. Gaff for his interest in our prospective, randomized, controlled trial on the use of propofol- vs desflurane-based general anesthesia in functional endoscopic sinus surgery.¹ The objective of our study was to test if one anesthetic strategy was superior to the other with regard to patient outcome; we found no advantage in surgical field visualization or bleeding with propofol- vs volatile anesthesia when controlled hypotension was achieved by remifentanyl titration.¹

The effect of different anesthetics on global warming is a legitimate, important and often under-recognized concern that definitely deserves attention;^{2–4} yet, it may not be as straightforward as Dr. Gaff states. First, not all volatile anesthetics have the same greenhouse effect; for example, sevoflurane and isoflurane are less impactful than desflurane;^{2,4} we had chosen to study desflurane because of its routine use at the study sites at that time, but have no reason to believe that other volatile agents would have led to different primary outcomes. Second, the amount of used fresh gas flow vs recycled gas in the anesthesia circuit plays a significant role in how much volatile anesthetic is released into the environment; this is mostly a matter of provider attention and education³ and the ability of the anesthesia machine to safely deliver minimal fresh gas flows. Third, as opposed to volatile anesthetics, propofol infusion regularly leaves variable left-overs that need to be discarded after a given case.⁵ And last, consumption of electricity set aside, for the calculation of the environmental

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impact of propofol anesthesia, its packaging (glass bottles, rubber/aluminum lids), the additionally necessary plastic iv lines +/- syringe,² the electrodes for anesthetic depth monitoring by Bispectral Index or SedLine® (Masimo Corporation, Irvine, CA, USA), – standard of practice and required now in our hospital for propofol-based general anesthesia in the presence of a neuromuscular blocker –, their respective costs and impact during production and after wastage would need to be taken into account as well when broadly advocating propofol over volatile anesthetics for environmental reasons. When general anesthesia is maintained by propofol, being mindful about reducing associated waste, specifically during shorter cases, remains paramount.⁵

So, while we completely agree with Dr. Gaff's appealing notion that "*From little things big things grow*", one may not forget another popular knowledge: "*The devil is in the detail*".

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