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Environmentally Responsible Mask Induction

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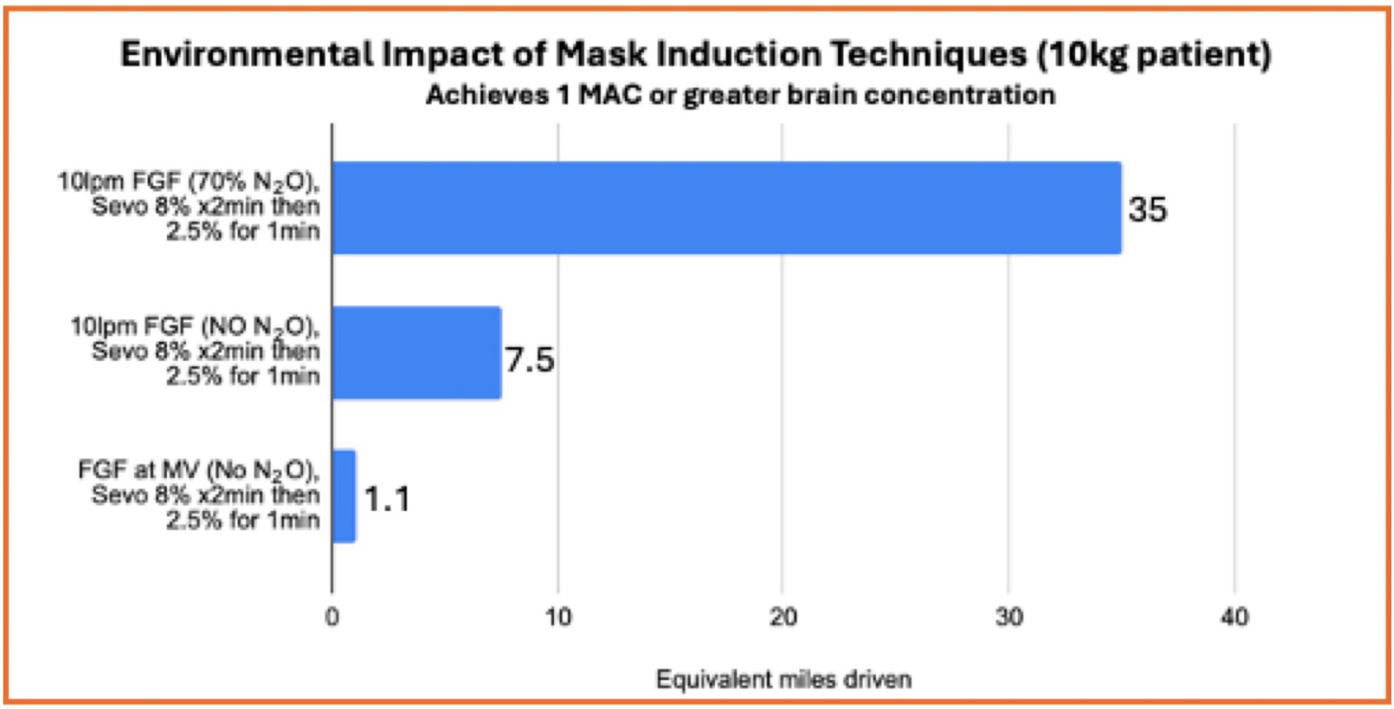
- High fresh gas flows (FGF) blending nitrous oxide (N_2O) and oxygen (O_2) were commonly used for halothane mask induction but are not required when using sevoflurane. Alternative strategies with sevoflurane can achieve effective mask induction while minimizing the negative environmental impact associated with high FGFs.

Effective mask induction techniques that minimize pollution[1]

- Set the maximum FGF to approximate the patient's minute ventilation (MV) (~150 ml/kg).[2] For small patients, mask ventilation skills are challenging at low flows.
- Set FGF to use O_2 or O_2/Air only and avoid N_2O.
- Reduce FGF when the exhaled anesthetic concentration approaches the inspired concentration. Monitor end-tidal anesthetic concentration to ensure adequate depth of anesthesia.
- Priming the circuit can help speed the induction, but it must be done correctly to minimize pollution.



Priming Technique	Clinical circumstance	Details
Partial priming to expedite mask induction	All mask inductions- expedites induction while providing gradual increase in inhaled agent	Just prior to induction, cover the mask with your hand. Empty the reservoir bag. Set FGF to MV and sevoflurane to 8% Once the reservoir bag is full, apply the mask.
Complete priming* of circuit to 8% sevoflurane	Uncooperative or combative patients, also single-breath inductions	Occlude the circuit, empty the reservoir bag, set FGF to MV and sevoflurane to 8%; allow the reservoir bag to fill. Then unplug the circuit, allowing FGF with sevoflurane to flow down the inspiratory limb. When the gas sample analyzer returns a reading with high concentration sevoflurane, stop FGF until ready to place the mask on the patient. Start mask induction with FGF set to MV.

*Requires ventilating into the operating room or a second reservoir bag.

References

1. Gordon D, Feldman J. Environmentally responsible mask induction, Best Practice & Research Clinical Anaesthesiology. 2025.
2. Glenski T, Narayanasamy S. Low flow anesthesia in pediatric patients. Society for Pediatric Anesthesia 2021. Link Accessed 30 May 2025.