



Shifting from volatile to total intravenous anesthesia is associated with environmental risks of its own

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To the Editor,

The current interest in anesthetic waste gas (WAG) pollution is laudable but may lead to inaccurate conclusions. If we focus solely on greenhouse gas (GHG) emissions, then it indeed makes sense to look seriously at reducing or eliminating our use of volatile anesthetics and nitrous oxide,¹ and shift to a total intravenous anesthesia-based practice. Nevertheless, this approach misses another important source of pollution from anesthetic practice—that of pharmaceutical waste water pollution. Many of our commonly used medications and their metabolites end up in the waste water stream, posing other potential risks to the environment.

For example, propofol is a persistent molecule like polychlorinated biphenyls or dichlorodiphenyltrichloroethane and, therefore, represents a significant risk for bioaccumulation in nature.² The only way to truly dispose of propofol is to incinerate it at > 1,000°C, which creates its own air pollution. Given to a patient, propofol is eliminated by hepatic glucuronidation and renal excretion. In nature as well as waste water treatment facilities, bacteria de-glucuronidate propofol back to its original state, which has a long half-life in the

environment. This means that excreted propofol and its metabolites have a high potential for bioaccumulation in nature.

I would suggest that, looking to the future, reducing our environmental impact is an important aim. Total intravenous anesthesia may not be the best way forward, but more study is required to fully understand the net impacts of our anesthetic drugs on the environment. The widespread use of nitrous oxide has largely been abandoned in current clinical anesthetic practice, reducing our GHG emissions greatly.^{3,4} There currently exist low-tech solutions to scrub WAG of volatile anesthetic gas emissions using charcoal filtration.^{1,5} This is a much simpler solution than trying to figure out how to reduce pharmaceutical pollution in waste water. We are currently exploring these issues of anesthetic pollution at our hospital, and I am hopeful that we can reduce or eliminate GHG emissions without just trading them for other forms of pollution.

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