

Making anesthesia more eco-friendly

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Used anesthetic gases can be simply and safely captured and recycled into new anesthetics, suggests new research being presented at Euroanaesthesia, the annual meeting of the European Society of Anaesthesiology and Intensive Care (ESAIC), held online this year.

Recent data shows that, globally, the [healthcare system](#) is responsible for 4.5 to 10 percent of all [greenhouse gas emissions](#) and that anesthetic gases make up approximately 5 percent of these emissions.

"Most of the anesthetic gas a patient breathes in isn't metabolized but exhaled, resulting in potent greenhouse gas emissions into the atmosphere," explains researcher Dr. Ana Castro.

To reduce these emissions, Dr. Castro and colleagues at Pedro Hispano Hospital, Matosinhos, Portugal, installed an innovative gas capture system in partnership with the system's supplier Baxter-ZeoSys.

Based on the principle of a circular economy, in which materials are reused for as long as possible, this system allows the waste gases to be caught before they are released into the atmosphere. They can then potentially be reused in future anesthetics.

Gas canisters containing highly porous adsorbent granules were used to catch the waste gas from four of the anesthesia machines at the Pedro Hispano Hospital.

The canisters, which collected 99 percent of the waste anesthetic gases,

were sent to an industrial unit when full and the captured gases extracted and purified. The use of the purified sevoflurane, one of the gases captured, in new anesthetics has recently been approved in Germany and Austria.

The installation and operation of the system was straightforward. The system was also found to be safe. Tests showed air quality in the operating theater to be normal, meaning that the system did not interfere with the quality of the air.

There were, however, some minor issues, such as alarms that were designed to go off when the canisters were full being triggered by disinfectants.

The canisters can be used with desflurane, sevoflurane and isoflurane, three of the most widely used gases in anesthesia. They are not compatible nor indicated for use with [nitrous oxide](#), a gas occasionally used anesthesia.

The researchers say: "We showed that this system, which had minimal interference on the usual workflow, can significantly reduce greenhouse gas emissions from anesthesia."

Dr. Castro adds: "Climate change is the biggest health challenge of the 21st century. Every industry is trying to reduce their carbon footprint and healthcare should be no different.

"There are a lot of uncertainties in this world but the need for healthcare to do its bit in combating pollution is not one of them.

"Applying the concept of the circular economy to anesthetic gases could create a paradigm shift in how we view and manage the environmental impact of anesthesia."

Provided by The European Society of Anaesthesiology and Intensive Care (ESAIC)

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