Consensus Statement on the Ethical Disposal of Nitrous Oxide

Background

Nitrous oxide (N_2O) is widely used in the healthcare industry. Unfortunately, it is a very potent greenhouse gas, contributing about 265 times more to climate change than the same mass of carbon dioxide. After carbon dioxide and methane, N_2O is the third-largest driver of human-induced climate change. Reducing N_2O emissions can therefore play a meaningful role in slowing climate breakdown.

The College of Anaesthesiologists of Ireland, the Royal College of Surgeons in Ireland, and the Institute of Obstetricians and Gynaecologists are actively engaged in initiatives aimed at reducing emissions and minimising associated risks to human health. For example, mitigation efforts within Irish anaesthesia and maternity services are already demonstrating positive results.

However, current practices still present significant challenges. After distribution, cylinders containing N_2O or an N_2O–oxygen mixture are returned to medical gas suppliers and vented into the atmosphere. In practice, even 'empty' cylinders still contain approximately 15% residual contents when returned. In addition, full or partially full cylinders are sometimes returned to the supplier because they have reached their three-year expiration date, or due to stock management issues. These are also vented into the atmosphere. Furthermore, all N_2O inhaled by a patient is exhaled in its original form. Therefore, all medical N_2O supplied for clinical practice ultimately ends up in the atmosphere where it contributes to human-induced climate change.

Technological innovations in the waste management industry mean that it is now possible to decompose N_2O into the harmless by-products oxygen and nitrogen in an environmentally sustainable manner. Recently developed N_2O decomposition facilities in Ireland have adequate capacity to process all the waste N_2O generated by the Irish healthcare industry.

Consensus Position

Environmentally responsible disposal of N_2O is a responsibility of all relevant stakeholders. If the clinical use of N_2O continues, it must, where feasible, be disposed of in an ethical and environmentally responsible manner. Venting directly into the atmosphere should occur only where no viable alternative exists.

Suppliers of medical gases who currently vent returned N_2O into the atmosphere have an ethical responsibility to implement effective systems that enable the decomposition of N_2O or to utilise an alternative means of preventing its release into the atmosphere. These systems could be implemented directly by suppliers or through partnerships with other organisations.

Healthcare organisations have an ethical, social, and environmental responsibility to work collaboratively with suppliers of N_2O to ensure that ethical disposal processes are integrated into procurement, decommissioning, and waste-management practices.

As clinical experts and principal users of medical nitrous oxide, the College of Anaesthesiologists of Ireland, the Royal College of Surgeons in Ireland, and the Institute of Obstetricians and

Gynaecologists strongly recommend the timely adoption of currently available technologies that enable the ethical disposal of returned nitrous oxide cylinders. We call on the HSE to ensure that such solutions are explicitly required and supported within national tendering, procurement, and decommissioning processes, in partnership with medical gas suppliers. By embedding these requirements into standard practice, Ireland has a clear opportunity to lead internationally in the ethically and environmentally responsible management of medical gases, while aligning clinical practice with national sustainability objectives.