CAI
THE COLLEGE OF ANAESTHESIOLOGISTS OF IRELAND

Guidelines For Responsible Anaesthesia

Delivering High-Value Care with Lower Environmental Impact

1. Anaesthetic Gases

Reducing the use of anaesthetic gases with high global-warming potential, particularly desflurane and nitrous oxide, offers substantial environmental benefit.

- Minimise all anaesthetic gases and do not use desflurane unless specifically clinically indicated (see the CAI Desflurane Guidance for more information). Use end-tidal controls when using vapours, titrate oxygen flows during sedation, and ensure flowmeters are turned off at the end of the day.

Nitrous Oxide:

- Avoid where possible, prefer oxygen/air as carrier gases.
- Decommission nitrous oxide manifolds and consider using portable cylinders instead (see the CAI National Nitrous Oxide Mitigation Project for more information). If this is not performed, perform regular leak tests on manifolds and pipeline networks.
- Waste capture and destruction technologies exist. However, due to their current cost and limited evaluation, we do not recommend their routine implementation at this time.

Alternatives:

- Encourage total intravenous anaesthesia (TIVA) using appropriate gas flows (4-6L/min) to minimise soda lime consumption.
- Use central neuraxial or regional anaesthesia where appropriate.

Image reproduced courtesy of BirdWatch Ireland

Entonox:

- Collaborate with midwifery teams to promote safe and sustainable use.
- Remove demand valves when Entonox is not used.
- Perform regular leak tests on manifolds and pipeline networks.
- Optimise stock management to avoid waste.
- Waste capture and destruction technologies exist. However, due to their current cost and limited evaluation, we do not recommend their routine implementation at this time.

2. Pharmaceutical Waste

- Dispose of drawn-up and unused medications in the appropriate container(s).
- Use prefilled syringes where appropriate.
- Use oral medications when appropriate e.g. administer oral paracetamol prior to procedures in elective cases or when neuraxial or regional anaesthesia is planned.

3. Equipment and Procedure Waste

- Open only equipment intended for immediate use.
- Avoid unnecessary gloves or equipment use e.g. gloves when drawing up drugs or gowns when not required for asepsis.
- Favour reusable or reprocessed equipment over disposable items. Work with theatre managers and procurement teams to source reusable alternatives to disposable items.
- Reprocess or recycle suitable single-use items where facilities allow.
- Adjust stock levels to minimise expiry-related waste.
- Rationalise anaesthesia supply carts and remove unnecessary items.
- Remove unnecessary items from pre-made procedure packs (e.g. neuraxial or central access kits) and from standard anaesthetic equipment setups.
- Donate unused or unopened equipment to appropriate organisations.

4. Solid Waste Segregation and Recycling

- Segregate waste according to type (pharmaceutical, solid, biohazard).
- Do not dispose of general waste in biohazard or sharps bins.
- Recycle or repurpose batteries safely.
- Implement a recycling policy for theatre waste, including clean plastics, paper, and cardboard.

5. Energy and Resource Conservation

- Conserve electricity by switching off ventilation, AGSS, anaesthetic machines, monitors, and other systems when theatres are not in use.
- Use reusable scrubs, gowns, warming jackets, patient gowns, and theatre caps.

6. Monitoring, Auditing, and Research

- Conduct regular waste audits to identify opportunities for waste reduction.
- Audit sustainability metrics and support related research initiatives.

7. Leadership and Advocacy

- Educate staff on the health, safety, and cost benefits of pollution mitigation projects.
- Develop or participate in sustainability committees and advocate for dedicated sustainability roles.
- Collaborate with hospital leadership to embed sustainability into core operational strategies.
- Contribute to environmentally preferable purchasing and contracting standards.
- Evaluate new equipment, facilities, and workflows for sustainability benefits.
- Lead sustainability-focused quality improvement and research projects.

These guidelines have been developed by the College of Anaesthesiologists of Ireland's Sustainability Committee in collaboration with the HSE Climate and Sustainability Programme.

Published: November 2025

CAI
THE COLLEGE OF ANAESTHESIOLOGISTS OF IRELAND

22 Merrion Square North, Dublin D02 X236, Ireland
+353 1 265 0600
info@coa.ie