

Australian and New Zealand College of Anaesthetists (ANZCA)

Faculty of Pain Medicine

Statement on Environmental Sustainability in Anaesthesia and Pain Medicine Practice

1. PURPOSE

The purpose of this statement is:

- 1.1 to affirm ANZCA's commitment to minimising the health impact of climate change and promoting environmental sustainability
- 1.2 to serve as a resource for clinicians to promote environmentally sustainable practices in their workplace
- 1.3 to assist healthcare facilities in embedding sustainable practices in the delivery of safe patient care
- 1.4 to confirm that environmentally sustainable behaviour represents effective patient care, is financially sustainable, and is the path towards better public health.

2. SCOPE

This document is intended to apply to all clinicians practising anaesthesia, perioperative medicine and pain medicine, and all healthcare facilities in which anaesthesia, perioperative and pain medicine services are provided.

3. BACKGROUND

The healthcare sector is highly interconnected with activities that emit pollution to air, water, and soils, and makes a significant contribution to the ecological footprint and anthropogenic climate change. Climate change has and will continue to impact on health outcomes¹. The impact will be particularly significant for vulnerable population groups, including children and the elderly, those nations living on low-lying small islands, the disadvantaged such as indigenous populations and people with pre-existing medical conditions. Furthermore, future generations are not responsible, yet will be most affected and are least able to affect change.

In Australia, over 7% of national carbon emissions is from the healthcare sector², of which ~5% of acute hospital carbon release is a direct result of anaesthesia³. All healthcare workers, including anaesthetists are in a position to significantly reduce greenhouse gas emission by making clinical and non clinical decisions with regard to the environment.

ANZCA's mission "to serve the community" encompasses a commitment to promoting practices that contribute to environmental sustainability. It is important to recognise that taking sustainability action now brings many co-benefits such as improved health and reduced health costs, subsequent reduced fossil fuel use, less air pollution, mitigation of rising temperatures, less waste, and increased green spaces. Better patient care can be achieved by redesigning



infrastructure and introducing innovative models of care, using new technologies, and judicious use of resources. Sustainable healthcare can reduce costs and waste and improve health.

4. STATEMENT

4.1 Inhalational Anaesthesia Agents

Inhalational agents used in anaesthesia have significant and sustained environmental impact. The effect of each agent is dependent on its absorption of infrared radiation that would otherwise leave the Earth's lower atmosphere, the amount used, and its atmospheric lifetime. As they are used in clinical practice, desflurane and nitrous oxide have a high intrinsic environmental impact, at least ten-fold greater than sevoflurane and isoflurane.

Their impact on the environment can be significantly reduced by clinicians:

- Utilising low-flow anaesthesia.
- Using agents that have a lower impact on the environment.
- Using techniques to minimise the requirement for inhalational agents, such as regional anaesthesia and total intravenous anaesthesia.

Such considerations must always be in the context of achieving optimal patient outcomes, in any individual case.

4.2 Infrastructure

Planning of future infrastructure should involve a "triple bottom line" approach, recognising that economic, social and environmental benefits are interdependent. Architectural elements such as natural light improve health, and good facility design improves workflow. New infrastructure should be built so that it is adaptable to the weather conditions and workplace efficiency reduces waste, energy demand and cost. Incorporating these elements has benefits for patients, staff health and well-being, and the environment.

Existing facilities can be redesigned or retrofitted with measures to reduce usage and wastage of natural resources, including water as well as energy. Use of water aerators, repairing leaking plumbing, motion-sensitive automatic surgical taps, turning off equipment and lights when not in use, occupancy-sensing air conditioning, and designing facilities to reduce requirements for lighting, heating and cooling can reduce wastage of these resources, and energy.

The source of energy for healthcare facilities plays a major part in their carbon footprint. Low carbon energy sources such as combined heat and power plants can considerably reduce the greenhouse gas production from healthcare.

4.3 Equipment and consumables

Operating theatre complexes use large amounts of energy, procure many consumables and produce excessive waste, often contributing to a quarter of all hospital waste⁴. As end users, clinicians should participate in hospital product evaluation committees and consider the environmental footprint of all equipment and consumables, particularly reusable and single use equipment by performing full life cycle assessments ('cradle to grave' analyses).

Clinicians and healthcare facilities can encourage manufacturers and suppliers to supply more environmentally friendly products, made from and packaged in recyclable and recycled materials.

Use of reusable surgical gowns, dedicated operating theatre footwear and freshly laundered lint free hats will reduce the amount of single use gowns, caps and overshoes that are discarded and add to waste. Theatre attire should meet standards set out in PS28 – Guidelines on Infection Control in Anaesthesia.

Using reusable anaesthesia equipment such as drug trays, face masks, breathing circuits and laryngoscope blades may reduce waste and save money. The net environmental effect of reusable versus single use equipment is a complex calculation, and depends upon the local energy source.

Management of stock volumes to allow for less wastage of expired and outdated stock (drugs and consumables) should occur. Unused and outdated stock and equipment should be collected and donated to developing nations after careful consideration of its eventual use, and the needs of the receiving communities. This reduces waste and provides much needed equipment for patient care in other communities.

Practices such as the drawing up of drugs and opening consumables for emergency use can be costly and wasteful. It also increases the risk of error and contamination. Other measures for rapid access to medications, such as pre-filled syringes may provide both financial and environmental benefits, as well as enhance safety. Reformulating pre-fabricated kits so they contain only the required products can also reduce unnecessary disposal of unused items.

4.4 Rational use of diagnostic tests and prescriptions

Rational use of diagnostic tests and prescriptions can reduce our environmental footprint through increasing workplace efficiency. Efficiency in healthcare means reducing waste while maintaining safety. This increases the overall value of the service we provide our patients. This may ultimately be reflected in improved health outcomes for patients, both directly and indirectly, through a cleaner environment, and should also contribute to reduced health costs ⁵.

Careful history, examination, review of notes and communication with general practitioners and other healthcare providers may avoid duplications of investigations. This saves both time and resources, for practitioners and patients alike, and it reduces the need to travel for unnecessary appointments and investigations.

For patients in rural and remote areas, evaluation, optimisation and ongoing management by a local general practitioner or healthcare provider may be more suitable than travelling to a major city. This would serve to minimise the need for transportation and its associated emissions. Consultation with a specialist anaesthetist or pain physician using information and communication technology, such as teleconferencing should also be considered.

Prescribing practices have a safety and environmental impact. Medications are not free of side effects and complications. Considered prescribing of medications, and monitoring of prescriptions can contribute towards reducing the demand for production, and the risk of diversion, particularly of opioid analgesic agents.

4.5 Waste Management

Operating rooms generate 20-30% of total hospital waste and 20-25% of this comes from anaesthesia services specifically ⁶⁻⁸. This includes general waste, recyclable waste and contaminated waste. Reducing waste is an important and key component in improving environmental sustainability. Clinicians should discard waste in such a way as to reduce environmental and financial costs. This includes the judicious segregation of contaminated waste and sharps from general and recyclable waste and appropriate disposal.

Recycling programs in healthcare facilities should be standard practice. Recycling programs can reduce operating theatre waste to landfill by up to 60%. Manufacturing goods using recycled products uses less fossil fuels. Most waste can be recycled if not contaminated by body fluids. Items which can be recycled include paper/cardboard, blue surgical/equipment wrapping, plastics, glass (including drug vials as drugs remain present in only small amounts and glass-making temperatures are sufficient to render drugs inert), batteries, fluorescent light bulbs and electronics (under e-recycling programs).

Compostable/biological waste streams allow for reduced landfill (or incineration), reduced carbon release, and better resource utilisation. Paper, compostable plastics and hospital food waste are all amenable to compost and vermiculture disposal.

Ensuring only needles and easily broken (tempered) glass medication vials are discarded in sharps bins reduces the frequency with which these receptacles are processed, providing both financial and environmental savings.

The method of disposal of medications can reduce environmental contamination and diversion. Discarding unused but drawn up drugs into sharps waste reduces landfill and water contamination.

4.6 Travel

Considerable direct and indirect health benefits arise from less travel. Fewer 'carbon miles' due to reduced air and road travel will reduce the global burden of climate change. Greater active and public transport will have health co-benefits through greater exercise, less obesity and diabetes; of benefit to ANZCA fellows and patients. ANZCA and its Fellows can be mindful of the benefits of teleconferencing on the environment and health.

4.7 Advocacy

Anaesthetists and Pain Medicine practitioners are well positioned to encourage system-wide solutions. As problem-solvers and leaders, they may encourage their organisations to make better decisions with respect to the environment, the climate, and public health.

4.8 Research

Supporting and funding audit and research in the environmental impact of clinical anaesthesia, perioperative medicine and pain medicine will continue to assist in improving and rethinking methods of environmental sustainability.

This document is accompanied by a background paper (PS64BP) which provides more detailed information regarding the rationale and interpretation of the Guidelines.

RELATED ANZCA DOCUMENTS

The following Professional Documents should be interpreted in light of this document:

PS07 Guidelines on Pre-Anaesthesia Consultation and Patient Preparation

PS28 Guidelines on Infection Control in Anaesthesia

PS51 Guidelines for the Safe Management and Use of Medications in Anaesthesia

REFERENCES

1. Watts N, Adger WN, Agnolucci P, et al. Health and climate change: policy responses to protect public health. *Lancet (London, England)*. 2015;386(10006):1861-1914.
2. Malik A, Lenzen M, McAlister S, McGain F. The carbon footprint of Australian health care. *The Lancet Planetary Health*.2(1):e27-e35.
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4. McGain F, Story D, Kayak E, Kashima Y, McAlister S. Workplace sustainability: the "cradle to grave" view of what we do. *Anesthesia and analgesia*. 2012;114(5):1134-1139.
5. Maughan D, Ansell J. *Protecting resources, promoting value – A doctor's guide to cutting waste in clinical care*. 2014.

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7. Axelrod D, Bell C, Feldman J, et al. Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice. In: *Anesthesiologists ASo*, ed2017.
8. Pungsornruk K, Forbes MP, Hellier C, Bryant M. A renewed call for environmentally responsible anaesthesia. *Anaesthesia and intensive care*. 2015;43(6):800-801.

FURTHER READING

American Society of Anesthesiologists', Environmental Sustainability

<https://www.asahq.org/resources/resources-from-asa-committees/environmental-sustainability>

Choosing Wisely Australia <http://www.choosingwisely.org.au/home>

Choosing Wisely New Zealand <http://choosingwisely.org.nz/>

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**This professional document is being piloted and will be reviewed in February 2019.*

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