

**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 ~~reducing-minimising~~ the health impact of climate change and ~~promoting-demanding~~ 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 ~~considering-embedding~~ sustainable practices in the provision of safe patient care ~~and in the design and build of healthcare infrastructure~~
- 1.4 to confirm that environmentally sustainable behaviour is ~~not only often also~~ financially sustainable, and represents effective patient care, ~~but is also the path towards better public health~~
- 1.5 ~~to emphasise a triple bottom line approach – patient, community, environment – which enables the most value to be extracted from each dollar of healthcare spending~~
- 4.4.1.6 ~~to recognize that climate change remains the biggest threat to public health, but is also the greatest opportunity for public health. -~~

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**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 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 outcomes<sup>1</sup>. The impact will be particularly significant for certain 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 will be most affected and are least able to affect change.

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 action on sustainability now, also brings with it many co-benefits such as improved health and reduced health costs through lower healthcare requirements and subsequently reduced fossil fuel burning, 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 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. Such measures reduce waste, energy demand and cost. Quality infrastructure has benefits for patients, staff health and well-being, and the environment.

Facilities can be redesigned or retrofitted with measures to reduce use and waste of natural resources, including water and energy. Using water aerators, fixing leaking plumbing, the use of motion-sensitive automatic surgical taps, turning off equipment and lights when not in use and designing facilities to reduce lighting requirements as well as heating and cooling can reduce waste of these resources.

##### 4.2 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 waste<sup>2</sup>. Clinicians should encourage hospital product evaluation committees to consider the environmental footprint of reusable and single use equipment by performing full life cycle assessments ('cradle to grave' analyses).

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, however the environmental effects of reusable versus single use equipment is complex 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. 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.

##### 4.3 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.<sup>3</sup>

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.

#### 4.4 Inhalational Anaesthesia Agents

Inhalational agents used in anaesthesia have an impact on the environment. 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.

Clinicians can reduce their impact on the environment by considering:

- 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 the optimal patient outcome in any individual case.

#### 4.5 Waste Management

Operating rooms generate 20-30% of total hospital waste and 20-25% of this comes from anaesthesia services specifically<sup>4,5,6</sup>. 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.

Healthcare facilities should have recycling programs as part of standard practice. Recycling programs can reduce operating theatre waste that ends up in 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 incineration temperatures are sufficient to render drugs inert), batteries, fluorescent light bulbs and electronics (under e-recycling programs).

Ensuring only needles and easily broken glass medication vials are discarded in the sharps bin reduces the frequency with which these receptacles are filled and processed. This provides both financial and environmental savings.

The method of disposal of medications can reduce environmental contamination and diversion. Discarding unused but drawn up drugs into the sharps waste receptacle ensures it is destroyed without contaminating landfill and water.

Encouraging Funding audit and research in the area of waste management will and the environmental impact of clinical anaesthesia and pain medicine will continue to assist in improving and rethinking methods of waste reduction and 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 2015 [https://doi.org/10.1016/s0140-6736\(15\)60854-6](https://doi.org/10.1016/s0140-6736(15)60854-6)
2. 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):1134-9.
3. Maughan D, Ansell J. Protecting resources, promoting value: a doctor's guide to cutting waste in clinical care [Internet]. Academy of Medical Royal Colleges, Nov 2014 Available from: [http://www.aomrc.org.uk/wp-content/uploads/2016/05/Protecting\\_Resources\\_Promoting\\_Value\\_1114.pdf](http://www.aomrc.org.uk/wp-content/uploads/2016/05/Protecting_Resources_Promoting_Value_1114.pdf)
4. Pungsornruk K, Forbes MP, Hillier M. A renewed call for environmentally responsible anaesthesia. Anaesth Intens Care. 2015;20:800–1.
5. Axelrod D, Bell C, Feldman J, Hopf H, Huncke TK, Paulsen W, et al. Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice. 2017.
6. Ard JL, Tobin K, Huncke T, Kline R, Ryan SM, Bell C. A Survey of the American Society of Anesthesiologists Regarding Environmental Attitudes, Knowledge, and Organization. A A Case Reports. 2016;6(7):208–16.

#### FURTHER READING

American Society of Anesthesiologists', Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice. <https://www.asahq.org/resources/resources-from-asa-committees/environmental-sustainability/greening-the-operating-room>

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 MONTH YEAR.  
(If applicable. Note: not to be included in background paper.)*

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