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Environmental Sustainability Audit Tool

This document has been developed by the ANZCA Environmental Sustainability Working Group to assist departments and practitioners to develop and maintain practices that promote environmental sustainability in line with ANZCA's professional document *PS64 Statement on Environmental Sustainability in Anaesthesia and Pain Medicine Practice* and the *ANZCA Statement on Climate Change*.

While there are many actions that may be undertaken to improve sustainable practice broadly within the health sector, this audit tool is designed to help identify interventions that could reasonably be considered at an individual or departmental level. It is acknowledged that there is considerable variation between departments, in regards to resources available within their health service and local area. It is the purpose of this tool to list all measures and allow users to select interventions that are feasible within their context.

The audit tool groups activities to improve environmental sustainability under the following headings: reduce, reuse, recycle, and leadership. In many instances, compliance with the suggested measure may simply be indicated by its presence or absence (that is, a yes/no response). In other cases it may be useful to consider progress using objective data (for example, stock procurement figures) and in some cases examples of how an area has been quantitatively audited in the past have been provided.

It is noted that while the measures listed below optimise environmental sustainability, there are often additional advantages to their implementation. In many cases, measures that improve environmental sustainability result in concurrent financial savings to health services. These measures often also have direct patient benefits, such as measures that minimise unnecessary patient encounters, investigations and interventions.

For further information about the resources used in the development of this audit tool please refer to the reference list at the end of the document.

Reduce

ACTIVITY	SUGGESTED MEASURES	SUGGESTED FEEDBACK/MEASUREMENT
Reduce volatile anaesthesia atmospheric waste.		
Rational use of volatile agents.	Encourage low fresh gas flow (<1L/minute) anaesthesia End-tidal control function on anaesthetic machine Discourage use of agents with high environmental impact (desflurane, N ₂ O) – for example, through staff education, access to desflurane vaporisers by request.	Review comparative volatile agent use with procurement data from pharmacy, with regular review of number of units ordered. Consider calculating monthly greenhouse gas release from this data for feedback to department. The Anaesthesia Carbon Calculator at jscalc.io/calc/H7gGXIL4tmDJHOxh allows providers to calculate the impact of their anaesthetic practice (also available as the 'Yale Gassing Greener' app).
Consider use of total intravenous anaesthesia.	Ensure adequate equipment availability – for example, TCI pumps, depth of anaesthesia monitors (note: Please refer to below regarding pharmaceutical waste from Propofol).	
Consider use of regional anaesthesia.	Ensure adequate equipment availability – for example, ultrasound machines, block needles. Education and support for regional anaesthesia use – for example, regional anaesthesia fellowship, continued professional development, appropriate post-operative APS review, consider regional “protocols” for various procedures in consultation with surgeons.	
Reduce anaesthesia equipment waste.		
Rational use of single use products.	Application of sequential compression devices according to agreed best practice. Application of warming devices according to agreed best practice. Prepare emergency equipment (for example, arterial line setup) only as required. Weekly change of anaesthesia breathing circuit.	
Consider reusable instead of single use products.	See below under Reuse .	
Review stock ordering practices to minimise discarding of unused and expired equipment.	Review prefabricated packs to remove unnecessary items. Review anaesthesia supply trolleys to remove unnecessary items. Regular review of surplus stock to adjust ordering practices.	
Donation of expired or clean discarded stock.	Reuse of equipment for education. Donation to health services in developing countries or to emergency wildlife organisations.	Liaise with organisations in your local area or services such as Medical Pantry that distribute donated expired medical stock.

Reduce

ACTIVITY	SUGGESTED MEASURES	SUGGESTED FEEDBACK/MEASUREMENT
Waste management practices that minimise environmental impacts		
Reduce anaesthesia pharmaceutical waste.	Use of pre-filled syringes for emergency drugs Encourage practices to minimise pharmaceutical waste – for example, drawing up drugs as required and use of appropriately sized ampoules for indication. This is particularly important for drugs with a high environmental impact (“persistence, bioaccumulation, toxicity”) when discarded (for example, Propofol).	
Appropriate disposal of non-recyclable waste.	Appropriate segregation of contaminated and non-contaminated waste. Appropriate use of sharps disposal bins (that is, needles and non-tempered, broken glass vials). Consider interventions to improve compliance, for example, reference posters outlining items suitable for disposal in sharps bin. Disposal of pharmaceutical waste into waste collected for incineration (for example, sharps bin) to avoid environmental contamination. Consider use of dedicated pharmaceutical waste bin.	Previous audits have reviewed compliance with appropriate sharps bin usage by photographing the surface of sharps bins, to review for inappropriate objects.
Theatre recycling programs	See below under Recycle .	
Reduce impact of other clinical and clinical support activities		
Rationalise clinical investigations and prescriptions	Develop guidelines for rationalised ordering of pre-operative investigations and prescriptions. Establish processes to obtain recent results to avoid duplicate ordering of tests. Encourage use of email to receive specialist correspondence and recent investigations, rather than fax or post.	Benchmarking with Choosing Wisely recommendations - http://www.choosingwisely.org.au/recommendations/anzca
Reduce electricity usage	Program computers to standby when not in use. Power down unused clinical and non-clinical areas out of hours. Change air-conditioning to low activity in unused operating theatres out of hours. Install motion-sensing lighting controls.	
Reduce water usage	Turn taps off during surgical hand scrubbing. Use water-free surgical hand scrubs where appropriate. Install water saving tapheads.	
Reduce waste in shared spaces.	Program computers to default to double sided printing. Remove disposable items from theatre/department tea rooms (e.g. disposable cups, cutlery) and replace sachets with bulk containers. Encourage use of journals in electronic form and cancel hard copy journal subscriptions.	
Reduce travel associated greenhouse gas emissions	Encourage use of teleconferencing for meetings across multiple sites. Utilise telehealth conferencing for pre-anaesthetic consultations in regional/remote areas. Consider guidelines for pre-admission clinic staff to allow identification of patients suitable for day of surgery review.	

Reuse

ACTIVITY	SUGGESTED MEASURES	SUGGESTED FEEDBACK/MEASUREMENT
Consider reusable instead of single use products.		
<p>Identify products where reusable options are available.</p> <p><i>Note: environmental benefit will vary depending on energy generation sources in your country/state: from excellent for N.Z. and Tasmania (renewables) to equivocal for Victoria (brown coal). Consider life cycle analysis and local protocols.</i></p>	<p>Reusable products that may be considered:</p> <ul style="list-style-type: none"> ▪ Face masks. ▪ Laryngoscope blades. ▪ Anaesthesia breathing circuits. ▪ Anaesthesia drug trays. ▪ Sterile gowns. ▪ Linen. ▪ Theatre attire – laundered, reusable scrub caps, dedicated theatre shoes. 	
<p>Participate in procurement / purchasing decisions to advocate for sustainable options</p>	<p>Work with local Infection Prevention and Control team to assess acceptable options. Consider life-cycle analysis of products and sustainable practices of suppliers.</p>	

Recycle

ACTIVITY	SUGGESTED MEASURES	SUGGESTED FEEDBACK/MEASUREMENT
Establishment of operating theatre recycling programs		
<p>Identify items that can be recycled</p> <p><i>Note: Whether particular products are recyclable vary based on region and availability of programs.</i></p>	<p>Consider segregation and recycling of:</p> <ul style="list-style-type: none"> ▪ Paper/cardboard. ▪ Plastics, PVC. ▪ Glass. ▪ Polypropylene (blue theatre wrap). ▪ Co-mingled. ▪ Batteries. ▪ Electronic waste. ▪ Syringes. ▪ Huck towels. ▪ Aluminium – for example, volatile anaesthetic containers. ▪ Surgical instruments. 	<p>Data from waste management services – e.g. weight of different waste streams collected.</p>
<p>Develop interventions to improve compliance and reduce contamination of recycling streams</p>	<p>Identify local “champions”.</p> <p>Reference posters outlining items suitable for recycling.</p> <p>Regular staff education.</p>	
Use of environmentally friendly single-use items		
<p>Identify options of single-use items made from recyclable, biodegradable or compostable materials</p>	<p>For example, biodegradable sugarcane-based injection trays.</p> <p>Liaise with local Infection Prevention and Control team to assess acceptable practice.</p>	
Encourage recycling and sustainable waste management outside of operating theatres		
<p>Manage e-waste</p>	<p>Request exchange of equipment for recycling or refurbishment when upgrading electronics.</p> <p>Consider repurposing electronic items instead of recycling.</p>	
<p>Establish waste stream for food and compostable waste</p>	<p>Segregate food and biological/compostable waste from general (landfill) waste.</p> <p>Encourage people to take home food and compostable waste for their own gardens.</p>	

Leadership

ACTIVITY	SUGGESTED MEASURES	SUGGESTED FEEDBACK/MEASUREMENT
Advocate for local initiatives that promote sustainability		
Engage the health service	Initiate discussion with key health service executive personnel regarding organisational responsibility for environmental sustainability.	
Develop local governance processes	Establish and participate in hospital sustainability committee. Establish and participate in sustainability working group for operating theatres. Consider involvement of representatives from anaesthesia, surgery, perioperative nursing leadership, hospital administration, building services, waste management, housekeeping and purchasing departments.	
Appoint key roles	Advocate for appointment of roles that promote sustainable practice – e.g. hospital sustainability officer, anaesthetic department lead in environmental sustainability.	
Promote environmental sustainability to colleagues and the community		
Build networks within your region	Regular meetings to collaborate and share local knowledge and experience. Join/work with other organisations, such as Doctors for the Environment, Australia.	
Develop education tools that promote sustainable practices in anaesthesia	Share resources from ANZCA's Resource Hub. Create orientation material for new staff. Develop a provisional fellowship in environmental sustainability. Advocate for sustainable meetings and events.	
Strengthen evidence with research and quality improvement activities		
Participate in research in environmentally sustainable anaesthesia	Life cycle analyses for products used in anaesthesia, where one does not already exist. Safety of using eco-friendly product.	
Conduct audits and quality improvement projects, providing positive outcomes to staff to motivate further change.	Performance of theatre recycling program. Quality use of investigations/prescriptions.	Audit financial outcomes (cost savings) Review weight of waste diverted from landfill



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References

ANZCA DOCUMENTS ON ENVIRONMENTAL SUSTAINABILITY AND CLIMATE CHANGE:

- [PS64 \(Statement on Environmental Sustainability in Anaesthesia and Pain Medicine Practice\)](#)
- [PS64BP \(Statement on Environmental Sustainability in Anaesthesia and Pain Medicine Practice Background Paper\)](#)
- [ANZCA Statement on Climate Change](#)

THE FOLLOWING ARTICLE PROVIDES AN OVERVIEW OF EVIDENCE FOR MANY OF THE INTERVENTIONS SUGGESTED IN THIS AUDIT:

- [Why be sustainable? The Australian and New Zealand College of Anaesthetists Professional Document PS64: Statement on Environmental Sustainability in Anaesthesia and Pain Medicine Practice and its accompanying background paper](#)
McGain F, Ma SC, Burrell RH, Percival VG, Roessler P, Weatherall AD, Weber IA, Kayak EA.
Anaesth Intensive Care. 2019 Sep;47(5):413-422.

RESOURCES FROM OTHER ORGANISATIONS:

- [American Society of Anaesthesiologists, 'Greening the Operating Room'](#)
- [Doctors for the Environment Australia, 'Improving a Hospital's Environmental Impact: What can a doctor do?'](#)