



## **Supporting Information**

### **Supplementary material**

**This appendix was part of the submitted manuscript and has been peer reviewed.  
It is posted as supplied by the authors.**

Appendix to: Pillay L, Winkel KD, Kariotis T. Developing the green operating room: exploring barriers and opportunities to reducing operating room waste. *Med J Aust* 2024; doi: 10.5694/mja2.52394.

## Appendix 1: Search streams used in the search strategy

Search Stream 1	Search Stream 2	Search Stream 3
<b>Surgery</b>	<b>Waste</b>	<b>Plastic</b>
“surgery” OR “surgeon” OR “surgical” OR “operating theat*” OR “surgical procedure*” OR “operating room*” OR “surgical hospital*” OR “ambulatory surgical centre” OR “ambulatory surgical center”.	“waste” OR “HCW” OR “healthcare waste” OR “health care waste” OR “medical waste” OR “clinical waste” OR “medical waste management” OR “waste disposal” OR “waste reduction” OR “healthcare waste management” OR “regulated medical waste” OR “waste treatment” OR “waste management” OR “segregat*” OR “waste sorting” OR “incineration” OR “recycl*” OR “hazardous waste” OR “non-hazardous waste” OR “Climate change” OR “emissions” OR “greenhouse gas” OR “greening” OR “environmental” OR “environmental impact*” OR “global warming” OR “sustainability”.	“PVC” OR “polyvinyl chloride” OR “plastic*” OR “single- use” OR “disposable” OR “reusable” OR “reprocess*” OR “unused”.
(TITLE (“surgery”)) AND (TITLE (“waste”)) AND (TITLE-ABS-KEY (“plastic”)) AND NOT (TITLE-ABS-KEY (“plastic surgery OR surgical mask”))		

## Appendix 2: Detailed methodology

The Critical Appraisal Skills Program checklist for systematic reviews (1) was utilised to appraise included studies according to validity and precision of results, quality analysis and generalisability. An overview of the study characteristics is outlined in Appendix 3. Quality analysis of this review was guided by the Critical Appraisal Skills Program (1) for systematic review and found to be of moderate strength. As seen in Appendix 3, the included studies were a mix of study types that addressed the research question. However, although many papers claimed there is an environmental and economic benefit to waste strategies, there are only seven studies which conducted a life cycle assessment, the gold standard method, to assess these impacts. Nine studies were conducted at university hospitals which are typically affiliated with a medical school and sustainability department; hence these hospitals may have undergone previous studies and audits which may bias the results.

## Appendix 3: Overview of study characteristics

Author	Date	Journal	Type of study	N	Setting	Country where research was conducted	Surgery
<b>Bravo (2)</b>	2023	Hand	LCA	85 cases	Single surgeon’s practice	USA	Hand
<b>Velicki (3)</b>	2023	Quality Management in Health Care	Quantitative	46 cases	Outpatient surgery centre	US	Hand
<b>Pradere (4)</b>	2023	European Urology	Review	38 studies	N/A	France	Multiple
<b>Friedericy (5)</b>	2022	Sustainability	LCA	N/A	1 small hospital	Netherlands	Multiple
<b>Perry (6)</b>	2022	Surgeon	Review	34 studies	N/A	UK	Multiple
<b>Engler (7)</b>	2022	Journal of the AAOS	Review	7 studies	N/A	US	Orthopaedic
<b>Papadopoulou (8)</b>	2022	The British Journal of Surgery	Review	16 studies	N/A	UK	Multiple
<b>Qin (9)</b>	2022	The Lancet Regional Health	Review	220 studies	N/A	USA, Sweden, Australia	Multiple

Author	Date	Journal	Type of study	N	Setting	Country where research was conducted	Surgery
<b>Meyer (10)</b>	2022	Surgery	Survey	219 responses	2 major academic centres	US	Multiple
<b>Shoham (11)</b>	2022	Surgery	Review	55 studies	N/A	USA	Multiple
<b>Braschi (12)</b>	2022	The American Journal of Surgery	Quantitative	35 cases	Single hospital	US	General surgery
<b>Harding (13)</b>	2021	Sustainability	Qualitative	8 surgeries observed and 5 interviews performed	Single hospital	Belgium	Urology
<b>van Straten (14)</b>	2021	Journal of Cleaner Production	Quantitative	30 devices	Materials from a tertiary hospital	Netherlands	Multiple
<b>Chiu (15)</b>	2021	Journal of Orthopaedic Surgery (Hong Kong)	Survey	222 responses	Email	Asia Pacific	Neurosurgery
<b>Wu (16)</b>	2021	Joint Commission Journal on Quality and Patient Safety	Review	78 studies	N/A	USA	Multiple
<b>Yates (17)</b>	2021	Annals of Surgery	Review	Unknown	N/A	USA	Multiple
<b>Ewbank (18)</b>	2021	Annals of Surgery	Review	Unknown	N/A	USA	Multiple
<b>Rammelkamp (19)</b>	2021	World Medical & Health Policy	Audit	222 cases	Medical Centre	USA	Multiple
<b>Jabbal (20)</b>	2021	Perioperative Care and Operative Room Management	Quantitative	3297 cases	Tertiary hospital	USA	Colorectal
<b>Walchak (21)</b>	2021	Perioperative Care and Operative Room Management	Quantitative	40 cases	University hospital, private hospital, private practice ASC.	USA	Orthopaedic
<b>Majernik (22)</b>	2021	Polish Journal of Environmental Studies	Review	Unknown	N/A	Slovakia	Multiple
<b>Ryan (23)</b>	2021	Military Medicine	Quantitative	22	Tertiary military hospital	USA	Otolaryngology
<b>Meissner (24)</b>	2021	Risk Management and Healthcare Policy	Quantitative	N/A	N/A	Germany	Multiple
<b>Chang (25)</b>	2020	Journal of Cataract and Refractive Surgery	Survey	1634 responses	Email	USA	Ophthalmology
<b>Vozzola (26)</b>	2020	AORN Journal	LCA	11 reusable and 7 disposable gowns	N/A	USA	Multiple

Author	Date	Journal	Type of study	N	Setting	Country where research was conducted	Surgery
<b>Bravo (27)</b>	2020	The Journal of Hand Surgery	Review	Unknown	N/A	USA	Orthopaedic
<b>Weller (28)</b>	2020	International Anaesthesiology Clinics	Article	Unknown	N/A	USA	Multiple
<b>Wyssusek (29)</b>	2020	American Journal of Surgery	Audit	22 ORs for 31 days	Tertiary hospital	Australia	Multiple
<b>Khor (30)</b>	2020	Journal of Cataract and Refractive Surgery	Quantitative	203 cases	Tertiary hospital	Malaysia	Ophthalmology
<b>Denny (31)</b>	2019	AANL Journal	Quantitative	37 ORs	University hospital, Tertiary hospital	USA	Multiple
<b>Rose (32)</b>	2019	The American Surgeon	Quantitative	30 cases	Tertiary hospital	USA	General Surgery
<b>Ubaldi (33)</b>	2019	AORN Journal	Review	1 Case	Ambulatory Surgery Center	USA	Multiple
<b>Candan Dönmez (34)</b>	2019	The Journal of Nursing Research	Qualitative	18 ORs	11 Tertiary hospitals	Turkey	Multiple
<b>Wyssusek (35)</b>	2019	Waste Management & Research: The Journal of ISWA	Review	84 studies	N/A	Australia	Multiple
<b>Thiel (36)</b>	2018	American Journal of Public Health	LCA	N/A	N/A	USA	Gynaecological
<b>Hubbard (37)</b>	2017	Anaesthesia and Analgesia	Quantitative	51 cases	University hospital	USA	Multiple
<b>Rigante (38)</b>	2017	Acta Neurochir	Quantitative	53 cases	University hospital	Netherlands	Neurosurgery
<b>Shinn (39)</b>	2017	Korean Journal of Anaesthesiology	Mixed qualitative and quantitative	8 cases	University hospital	Korea	Multiple
<b>Unger (40)</b>	2017	Journal of Health Services Research & Policy	LCA	N/A	N/A	USA	Gynaecological
<b>Zygourakis (41)</b>	2017	Journal of Neurosurgery	Quantitative	58 cases	University hospital	USA	Neurosurgery
<b>Thiel (42)</b>	2017	Journal of Cataract Refractory Surgery	Mixed qualitative and quantitative, LCA		2 Tertiary care centres	India	Ophthalmology
<b>Weiss (43)</b>	2016	Current Problems in Surgery	Article	N/A	N/A	USA	Multiple
<b>de Sa (44)</b>	2016	Journal of Hip Preservation Surgery	Audit	5 cases	University hospital	Canada	Orthopaedic
<b>McGain (45)</b>	2015	A & A Case Reports	Audit	237 cases	Tertiary hospital	Australia	Multiple
<b>Albert (46)</b>	2015	Plastic Surgery	Quantitative	Unknown	University hospital	USA	Multiple

Author	Date	Journal	Type of study	N	Setting	Country where research was conducted	Surgery
Pfefferle (47)	2015	Clinics in Orthopaedic Surgery	Quantitative	N/A	Orthopaedic hospital	USA	Orthopaedic
Thiel (48)	2015	Environmental Science & Technology	LCA	62 cases	N/A	USA	Gynaecological
Stall (49)	2013	Canadian Journal of Surgery	Audit	5 cases	N/A	UK	Orthopaedic
McGain (50)	2012	Anaesthesia and Analgesia	Survey	780	Email	Australia	Multiple
Lee (51)	2012	Orthopaedics	Article	N/A	N/A	USA	Orthopaedic
Kagoma (52)	2012	CMAJ	Review	65	N/A	UK	Multiple
Power (53)	2012	Journal of Endourology	Quantitative	2,520,223 cases	University Hospital	UK	Multiple
Schulz (54)	2011	Globalized Solutions for Sustainability in Manufacturing	LCA	N/A	N/A	Germany	Multiple
Levendis (55)	2001	Chemosphere	Quantitative	N/A	N/A	USA	Multiple
Pennino (56)	1994	Plastic and Reconstructive Surgery	Qualitative	12 hospitals	Tertiary hospitals	USA	Multiple
Tieszzen (57)	1992	JAMA	Quantitative	27 cases	Tertiary hospital	USA	Multiple

## Appendices reference list

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