Environmental Impact of Surgery

St Joseph's Healthcare Hamilton

AstraZeneca

Sustainable Healthcare Coalition

August 2026

Title	Average hour of surgery at St. Joseph's Healthcare Hamilton
Organisation and role	AstraZeneca UK Limited initiated and funded this work, but it was not involved in collecting and analysing the hospital data. AstraZeneca UK Limited saw only the final output.
Company website	www.astrazeneca.com/
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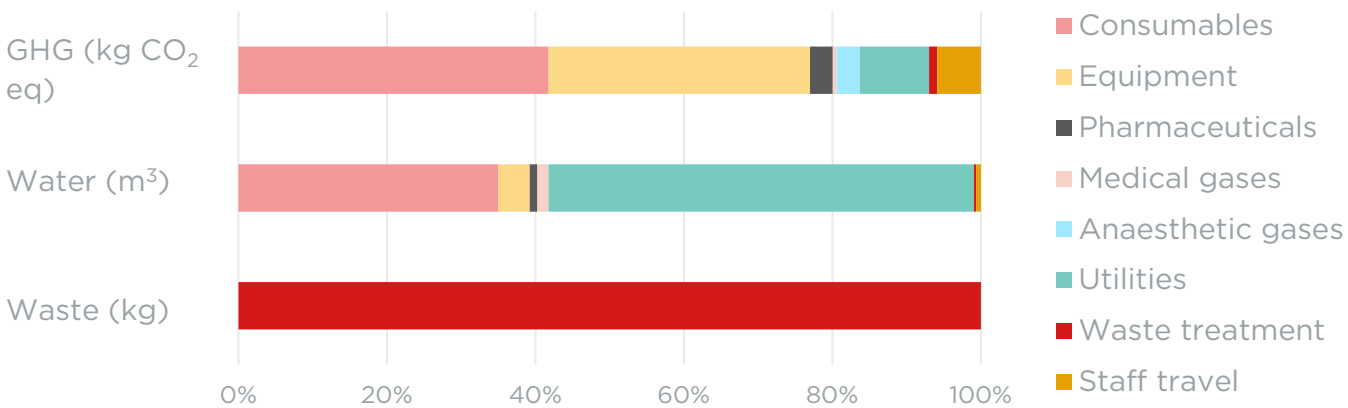
Completion date	June 2026
Assurance	Internal assurance
Supporting information	Operational data from St. Joseph's Healthcare Hamilton, Canada
Data gathering and analysis contact	Michael Collins, Partner, ERM (michael.collins@erm.com)
Hospital contact	Deanna Burnet (dburnet@stjoes.ca)
Conformance with Care Pathways: Appraising Sustainability Method[1]	Adheres to the method
Care pathway description	Average hour of surgery
Environmental issues appraised	Global warming potential (IPCC AR6, CO_2 eq, 100-year), water use, waste

This resource is supplementary material for the study 'Appraisal of Environmental Impact of St. Joseph's Healthcare Hamilton.'[2] Refer to that document for a description of the assessment procedures.

Findings

This study appraised the environmental impact of an average hour of surgery. The study found a greenhouse gas (GHG) emission impact of 164 kg CO_2 eq, freshwater use of 402 m^3 and waste of 2.5 kg per hour of surgery.

The climate change impact per hour surgery is driven by consumables (42%), equipment (35%), utilities (9%) and staff travel (6%). The consumables impact is driven by single-



[1] Sustainable Healthcare Coalition (2026). Sustainable Care Pathways Method. Available at: https://shcoalition.org/sustainable-care-pathways-guidance.

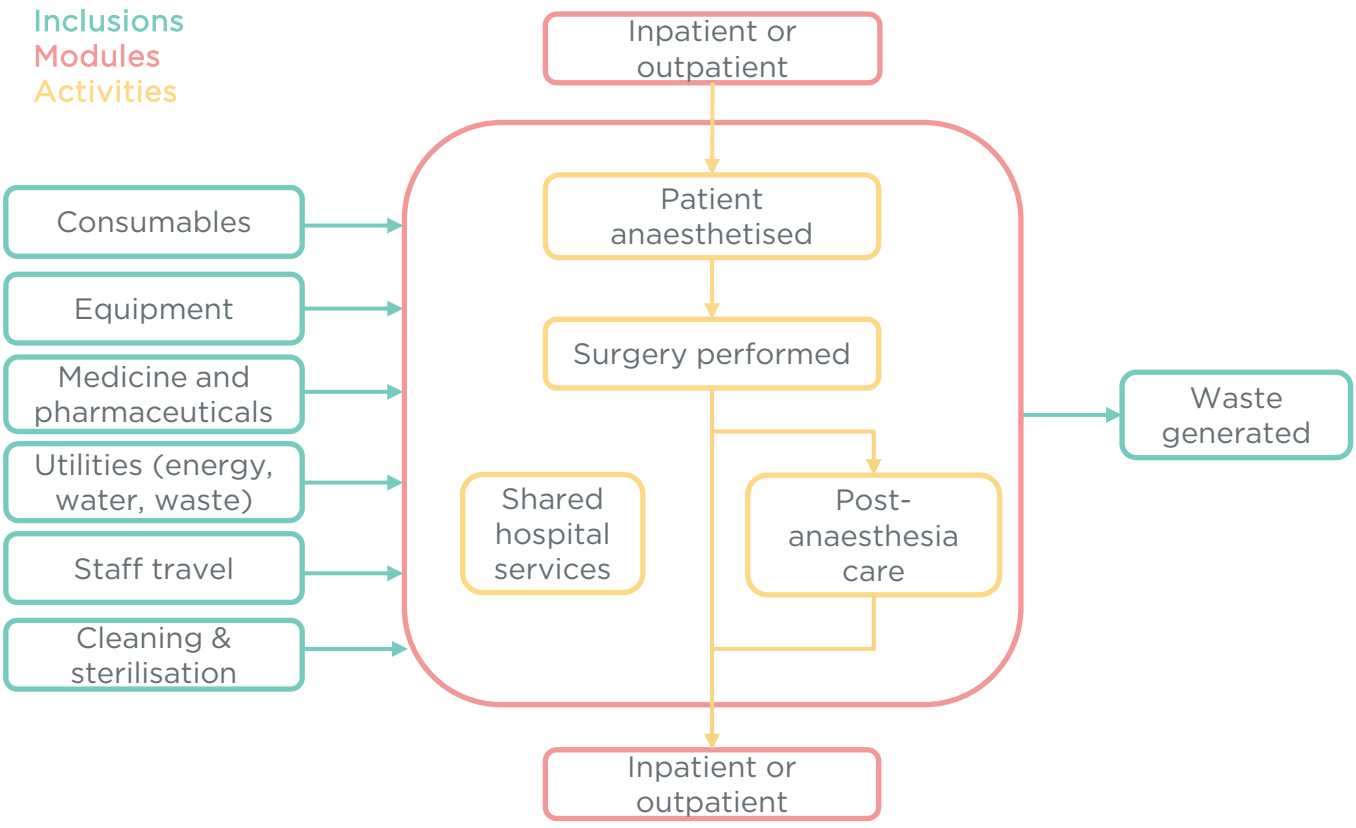
[2] ERM (2026) Appraisal of Environmental Impact of St. Joseph's Healthcare Hamilton. Available at: https://shcoalition.org/wp-content/uploads/2026/09/Hospital_StJosephs.pdf

use clinical and procedural devices, with suction canister liners as the main contributor.

Further impacts arose from specialist surgical consumables (e.g. dissection devices, arterial catheter sets, guidewires), many modelled using EEIO emission factors. Additional contributions were associated with PPE, advanced wound-care and biological materials and routine consumables. Equipment impacts are dominated by specialised diagnostic and surgical equipment, particularly paediatric bronchoscopes. Utilities' impacts are driven largely by the hospital's use of natural gas and staff travel impacts are primarily associated with internal combustion engine-powered vehicle travel.

Scope

- This assessment appraises the environmental impact of an hour of surgery at the Charlton Campus Hospital.
- The functional unit of the system studied is an hour of surgery in FY25.
- The scope includes patient anaesthesia, surgery and post anaesthesia care treatment. The scope does not include referral to inpatient or outpatient departments.



Data

Primary data for the surgery department were collected for FY25 for consumables, equipment, pharmaceutical products, staffing and patient throughput. Primary data for the hospital were collected for FY25 and allocated to the surgery activities on a floor space basis for utilities, waste management, patient nutrition, medical gases and nitrous oxide (an anaesthetic gas). Of the anaesthetic gases, sevoflurane was assumed to be used only in surgery, whereas nitrous oxide was assumed to be used across all listed departments. The impacts of shared non-clinical hospital services were allocated to the surgery activities on a floor space basis. The environmental impact of the surgery department for FY25 was modelled and then divided by the total number of FY25 surgery hours.

Results

Results are presented as the environmental impact per hour of surgery in the surgery department at the Charlton Campus Hospital.

Module	GHG kg CO_2 eq	Water m^3		Waste kg
		Direct	Indirect	
Consumables	68.3	-	140	-
Equipment	57.6	-	17.1	-
Pharmaceuticals	5.04	-	4.22	-
Medical gases	0.848	-	6.08	-
Anaesthetic gases	5.16	-	0.007	-
Utilities	15.2	0.324	230	-
Waste treatment	1.78	-	1.19	2.51
Staff travel	9.62	-	2.57	-
Total	**164**	**0.324**	**402**	**2.51**

Acknowledgements

This document has been developed collaboratively with St. Joseph's Healthcare Hamilton and the Sustainable Healthcare Coalition. The Coalition comprises a range of organisations within the healthcare sector, including pharmaceutical and medical device companies, trade bodies, procurement, government organisations and other stakeholders. The Sustainable Healthcare Coalition operates with the aim of facilitating the journey towards good health and wellbeing on a finite planet, through open-minded collaboration across public and private healthcare.