



Greening the OR

Introduction

Between 20 and 30% of a hospital's waste stream may be generated in just one department-- Surgical Services. Greening the OR™ is a Practice Greenhealth program focused on providing concentrated sustainability support and assistance to a department that generates a significant portion of the hospital's environmental footprint. The Greening the OR™ program aims to improve worker and patient safety, increase efficiency, and reduce cost while concurrently reducing waste, energy and environmental impact. Practice Greenhealth is looking forward to learning about your programs in this important department.

Several questions have been included to try and better understand the impact of the COVID-19 pandemic on the **operating room** environment.

1.* Does your facility have **operating rooms**/procedure rooms or perform a significant amount of surgery?

- ☐ Yes
☒ Not Applicable

This page intends to gather information on facilities performing surgical procedures. If your facility only performs minor procedures on rare occurrences, then please select "Not Applicable" and provide a brief explanation.

1.a* Please explain why questions about **operating rooms** are not applicable to your facility:

If your facility does not have **operating rooms**/does not perform surgical procedures, please move on to the next page (leaving the rest of this page blank).

2.* Did the facility **cancel or postpone elective surgeries** for any period of time (either by organizational decision or mandate) during the past year due to COVID-19?

- ☒ Yes
☐ No

2.a* Please indicate the **length of time** elective surgeries were not performed:

- ☐ 0-2 weeks
☐ 2-4 weeks
☐ 4-6 weeks
☒ Longer than 6 weeks total

2.a.a* Please indicate how many weeks the OR was **unavailable/shutdown** for elective surgeries:

2.b* Please indicate the number of elective surgeries cancelled or postponed (if known):

3.* Were there any changes made to **operating room protocol** as a result of the COVID-19 pandemic?

- ☒ Yes
☐ No

3.a* Please briefly describe:

4.* Does your facility have a sustainability champion in the OR?

- ☒ Yes
☐ No

This question is asked "new" each year, as champions come and go. Practice Greenhealth wants to understand who was leading or influencing the OR work over the course of the past year.

Contact Information:**4.a***

Name of sustainability champion or leader in the OR:

4.b*

Title of sustainability champion or leader in the OR:

4.c*

Email of sustainability champion or leader in the OR:

Medical Device Reprocessing

Reprocessing of medical devices goes beyond the **operating room** and includes many other patient care areas. To simplify, Practice Greenhealth is asking all questions pertaining to single-use device (**SUD**) reprocessing on the Greening the OR page. Please enter all **SUD** reprocessing data below.

5.* Has the facility implemented a **medical device reprocessing** program with an FDA-approved third party reprocessor?

Practice Greenhealth would like to capture the purchasing power of the health care sector through the dollars spent on reprocessed devices. In the table below, please enter the **total avoided waste** in pounds (Lbs) and the total dollars **spent** on purchasing FDA-approved reprocessed medical devices in 2020.

Table B2. SUD Reprocessing Collection Data

SUD Reprocessing Collection Savings	Total
Weight of devices collected (in pounds, Lbs)	5.a* <input type="text"/>
Weight of devices collected, converted to tonnage	5.b* <input type="text" value="0"/>
Avoided waste disposal costs	5.c* <input type="text"/>
Total \$ spent on purchase of reprocessed devices in 2020	5.d* <input type="text"/>
Total \$ saved through medical device reprocessing program in 2020.	5.e* <input type="text"/>

Table B3. Medical Device Reprocessing Metrics

Pounds of reprocessed devices collected per OR procedure:	5.f* <input type="text" value="0"/>
Pounds of reprocessed devices collected per OR:	5.g* <input type="text" value="0"/>
Dollars saved on reprocessed devices per OR procedure	5.h* <input type="text" value="0"/>
Dollars saved on reprocessed devices per OR	5.i* <input type="text" value="0"/>

Waste Reduction in the OR

Identifying opportunities to eliminate unnecessary waste from the **operating room** waste stream can help facilities reduce upfront purchasing costs as well as avoid waste disposal costs, and reduces the amount of waste requiring disinfection/treatment. Please highlight any strategies or projects the facility has utilized to reduce the amount of waste leaving the OR, including reducing unnecessary supplies, better inventory tracking, using reusable or reprocessable equipment, and more.

6.* Does the facility **reformulate custom procedure packs**--removing supplies not typically used--to reduce purchase and disposal fees for excess supplies, and decrease the environmental impact of manufacture and disposal of those supplies?

☒ Yes

☐ No

Please fill in **Table C**. Please enter the number of **types** of kits the facility uses (e.g., 32 different types of custom kits, of which, 28 types were reviewed).

Table C. OR Kit/Custom OR Procedure Pack Reformulation Waste and Supply Savings

Total number of custom OR procedure pack types	6.a* <input type="text"/>
Number of pack types reviewed	6.b* <input type="text"/>
Percent of OR custom pack types reviewed	6.c* 0 <input type="text"/>
Optional:	
Avoided purchase cost of unnecessary supplies	6.d* <input type="text"/>
Avoided waste disposal savings (\$)	6.e* <input type="text"/>
Other savings	6.f* <input type="text"/>
Total savings	6.g* 0 <input type="text"/>

7.* Does the facility purchase and use **reusable surgical items** where environmentally and clinically preferable?

Yes

7.a* Please indicate any reusable surgical items utilized in the OR a **majority (or >75%) of the time**.

--*Note: ***Do not** include single-use reprocessed devices for this question - only items specifically labeled by the FDA as 'reusable' medical devices.

- ☐ Anesthesia circuits
- ☐ Back table covers
- ☐ Blood pressure cuffs
- ☐ Cautery handles and cords
- ☐ Corner protectors
- ☐ Cubicle curtains
- ☐ Isolation gowns
- ☐ Endotracheal Tubes (ETT)
- ☐ Grounding pads
- ☐ Laryngeal Mask Airways (LMA)
- ☐ Laryngoscope blades/handles
- ☐ Light handles
- ☐ Mayo stand covers
- ☐ Patient belonging bags
- ☐ Patient linens (gowns, sheets, bath blankets, pillow cases)

- ☐ Patient positioning devices
- ☐ Patient transfer devices
- ☐ Patient warming devices
- ☐ Pneumatic compression tourniquets
- ☐ Pulse oximetry sensors
- ☐ Sterilization wrap
- ☐ Surgical staplers
- ☐ Suction canisters
- ☐ Surgical drapes
- ☐ Surgical gowns
- ☐ Surgical towels
- ☐ Safety belts
- ☐ Surgical basins, pitchers and medicine cups
- ☐ Trocars
- ☐ Velcro straps
- ☐ Visitor jump suits
- ☐ Other

7.b* Out of 32 possible product categories, the facility reuses items in this many categories:

0

Table D. Savings from Reusable Linens in the OR

If tracked, please indicate tonnage of reusable linens used in the OR:	7.c* <input type="text"/>
If tracked, please indicate any cost savings from reusable linens in the OR:	7.d* <input type="text"/>
This is the facility's tons of reusable linens per OR:	7.e* 0 <input type="text"/>

8.* Does the facility utilize **reusable sterilization containers** for surgical instrumentation and reduction of disposable sterile wrap?

- ☒ Yes
☐ No

Please fill in Table E. (E.g., the facility used 6250 total instrument trays in 2020; of those, 4688 instrument trays were sterilized in reusable containers for a total of 75% trays in reusable sterilization containers)

Table E. Savings from Reusable Sterilization Containers in the OR

Total number of instrument trays used	8.a* <input type="text"/>
Number of instrument trays used in reusable sterilization containers	8.b* <input type="text"/>
Percent of instrument trays utilizing reusable sterilization containers	8.c* 0 <input type="text"/>
Total (\$) <u>spent</u> on bluewrap in 2020	8.d* <input type="text"/>
Optional:	
Avoided purchase cost (\$ saved) of bluewrap	8.e* <input type="text"/>
Avoided waste disposal (tonnage)	8.f* <input type="text"/>

Avoided waste disposal fees	8.g* <input type="text"/>
Other comments or savings	8.h* <input type="text"/>
Total savings	8.i* 0 <input type="text"/>

Energy Management

The **operating room** is a significant user of energy, with high demand from life-saving medical equipment, high air change per hour requirements, lighting, and more. As a result, strategies to reduce energy consumption in the **operating room** can derive considerable cost and energy savings. Please highlight any energy efficiency projects or strategies in the **operating room** in the section below.

ASHRAE 170 requires a certain number of air changes per hour to ensure patient safety and reduce the risk of surgical site infections in the OR. Some facilities assume that more air exchanges (exceeding code) equals better patient safety despite little clinical evidence to support it.

For more information on HVAC Setback Programs for the **Operating Room**, please see the American Society for Healthcare Engineering's **OR HVAC Setback Monograph**.

9.* Has the facility **programmed the HVAC system to reduce air changes per hour** (HVAC setback) when the ORs are **unoccupied** to reduce energy consumption?

- ☒ Yes
☐ No

Table F1. HVAC Setback in the OR

How many ORs have implemented an HVAC setback program?	9.a* <input type="text"/>
Operating Rooms (ORs):	9.b* <input type="text"/> From your Facility Profile.
Your facility utilizes HVAC setback in this percent of your ORs, based on above information:	9.c* 0 <input type="text"/>
What is the rate of air exchanges per hour (ACH) during normal hours/when the OR is occupied ?	9.d* <input type="text"/>
What is the rate of air exchanges per hour (ACH) during unoccupied/setback mode ?	9.e* <input type="text"/> Note: This number should be less than the ACH during occupied mode (above).
Percent reduction in air exchange rate (occupied to unoccupied)	9.f* 0 <input type="text"/>

Anesthesia Use

Leading hospitals are re-evaluating the anesthesia care regime for environmental stewardship opportunities that align with patient safety and/or cost reduction. As a **Scope 1 greenhouse gas (GHG)**, choice and management of anesthetic gases is important to the facility's overall **GHG** emissions and climate impact. The volatile anesthetic agents used for patient care in an **operating room** or procedural setting are often vented directly into outside air. Even intravenous anesthetic agents, which don't generate greenhouse gases, have an impact on the environment and must be incinerated rather than contaminate land and water supply. And with severe drug shortages, it is even more critical to be sure the facility is carefully managing their use. Tracking and evaluating the use of the different anesthetic agents that are both clinically effective and environmentally preferable is indicative of culture change within the clinical practice.

10.* Has the facility removed desflurane from its formulary?

- ☐ Yes

☐ No

11.* Please enter the **Baseline Year** the facility began tracking **greenhouse gas** emissions from purchased inhaled anesthetic gases.

*Note: Baseline Year should be the first year the facility is able to enter complete anesthetic gas use data (Table I and Table J). Data entered in Table H should correspond accordingly to Table I and Table J.

Please list the **total number of general anesthesia cases and hours** performed in 2020 at the facility (include all adults, pediatrics, OB/GYN, interventional radiology, ambulatory, off-floor, other) in baseline, previous and current year in Table H. below.

Table H. General Anesthesia

	Baseline year	Previous year	Current year
General anesthesia cases	12.* <input type="text"/>	13.* <input type="text"/>	14.* <input type="text"/>
General anesthesia hours	15.* <input type="text"/>	16.* <input type="text"/>	17.* <input type="text"/>

Please indicate the **volume of volatile anesthetic agents purchased** by the facility in Table I below. Please be sure to match the number of bottles with the appropriate size in mL **purchased** for each agent --the "unit" may vary per facility. The information entered into this table will be used to calculate and populate the Scope I **greenhouse gas** emissions for waste anesthetic gases on the Climate page of this application.

Table I. Purchased Volatile Anesthetic Agents

Volatile Anesthetic Agent	Number of Bottles Baseline Year	Number of Bottles Previous Year	Number of Bottles Current Year	MTCO2E Baseline	MTCO2E Previous	MTCO2E Current
Sevoflurane						
100 mL	18.* <input type="text"/>	19.* <input type="text"/>	20.* <input type="text"/>	21.* <input type="text"/>	22.* <input type="text"/>	23.* <input type="text"/>
250 mL	24.* <input type="text"/>	25.* <input type="text"/>	26.* <input type="text"/>	27.* <input type="text"/>	28.* <input type="text"/>	29.* <input type="text"/>
30.* Other size (in mL) <input type="text"/>	31.* <input type="text"/>	32.* <input type="text"/>	33.* <input type="text"/>	34.* <input type="text"/>	35.* <input type="text"/>	36.* <input type="text"/>
Total Sevoflurane:				37.* <input type="text"/>	38.* <input type="text"/>	39.* <input type="text"/>
Isoflurane						
100 mL	40.* <input type="text"/>	41.* <input type="text"/>	42.* <input type="text"/>	43.* <input type="text"/>	44.* <input type="text"/>	45.* <input type="text"/>
250 mL	46.* <input type="text"/>	47.* <input type="text"/>	48.* <input type="text"/>	49.* <input type="text"/>	50.* <input type="text"/>	51.* <input type="text"/>
52.* Other size (in mL) <input type="text"/>	53.* <input type="text"/>	54.* <input type="text"/>	55.* <input type="text"/>	56.* <input type="text"/>	57.* <input type="text"/>	58.* <input type="text"/>
Total Isoflurane:				59.* <input type="text"/>	60.* <input type="text"/>	61.* <input type="text"/>
Desflurane						
240 mL	62.* <input type="text"/>	63.* <input type="text"/>	64.* <input type="text"/>	65.* <input type="text"/>	66.* <input type="text"/>	67.* <input type="text"/>
68.*	69.*	70.*	71.*	72.*	73.*	74.*

Other size (in mL)				0	0	0
Total Desflurane:				75.*	76.*	77.*
				0	0	0

Please indicate the facility's **nitrous oxide usage** during this award cycle year in the Table I below. Nitrous oxide comes in gaseous form, compressed in a cylinder or tank. Institutions typically have two types of nitrous oxide cylinders: 1. Portable tank - in the US, this is a standard size E-cylinder that is attached to the back of every anesthesia machine. 2. Stationary tank - this is a very large cylinder from which the gas gets piped through the walls of the hospital and into the anesthesia machine. Enlist the help of the clinical engineering department, pharmacy, or the medical gas supplier. Typically, the medical gas supplier/ vendor can report the total pounds of nitrous oxide supplied to the facility annually. Although nitrous oxide can be used in many departments outside the **operating room**, for the purposes of this application, please enter the facility's total usage here. This will be used in addition to the data supplied in Table I. to calculate the facility's Scope I **greenhouse gas** emissions from waste anesthetic gases on the Climate page.

Table J. Nitrous Oxide Purchase

	Total pounds of Nitrous Oxide Baseline Year	Total pounds of Nitrous Oxide Previous Year	Total pounds of Nitrous Oxide Current Year	MTCO ₂ e Nitrous Oxide Baseline Year	MTCO ₂ e Nitrous Oxide Previous Year	MTCO ₂ e Nitrous Oxide Current Year
Nitrous Oxide Footprint	78.*	79.*	80.*	81.*	82.*	83.*
				0	0	0

84.* Is the total annual purchasing volume for **ALL** anesthetic gases purchased and used by the organization (desflurane, sevoflurane, isoflurane and nitrous oxide) entered in Table I and Table J above? Note: in order to capture and report an accurate **Scope 1 GHG** footprint from anesthetic gases, all gases used by the organization must be entered.)

No

Understanding if a facility's anesthetic gas profile is complete helps ensure accuracy for benchmarking.

84.a* Please explain why entire total annual purchasing volume for all anesthetic gases cannot be entered.

Scope I Greenhouse Gas Emissions from Purchased Anesthetic Gases

Scope 1 GHG Emissions from Purchased Anesthetic Gases	Baseline Year Total MTCO ₂ e	Previous Year Total MTCO ₂ e	Current Year Total MTCO ₂ e	Percent Reduction MTCO ₂ e Baseline Year	Percent Reduction MTCO ₂ e from Previous Year
Purchased volatile anesthetic agents	85.*	86.*	87.*	88.*	89.*
	0	0	0	0	0
Purchased nitrous oxide	90.*	91.*	92.*	93.*	94.*
	0	0	0	0	0
Total from all purchased inhaled anesthetics	95.*	96.*	97.*	98.*	99.*
	0	0	0	0	0

Please Note: Totals and percent change in this table will only appear if you have indicated above that the total annual purchasing volume for ALL anesthetic gases purchased and used by the organization (desflurane, sevoflurane, isoflurane and nitrous oxide) are entered in Table I and Table J above. If you only have partial data for a particular year (baseline, previous, or current), the percent change metrics may not calculate.

MTCO ₂ e per OR	MTCO ₂ e per General Anesthesia Cases	MTCO ₂ e per General Anesthesia Hours	MTCO ₂ e per Total Surgical Procedures
100.*	101.*	102.*	103.*
0	0	0	0

Use Practice Greenhealth's **Anesthetic Gas Toolkit** for additional information on calculating the **greenhouse gas** emissions from purchased anesthetics.

The American Society of Anesthesiologists provides guidance on Greening the OR for anesthesiologists in **Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice**.

Other Greening the OR Program Successes

Please describe any other innovative Greening the OR programs or successes at the facility this past year (not mentioned above) that you would like to share in the spaces below. Please feel free to provide commentary and/or attach a file.

104.* GOR Success 1: Please describe

105.* Please attach any additional documentation (optional) for **GOR** Success 1:

106.* GOR Success 2: Please describe

107.* Please attach any additional documentation (optional) for **GOR** Success 2:

The content of all material available on awards.practicegreenhealth.org is copyrighted by Practice Greenhealth.
Reproduction in whole or in part without written permission is prohibited.

©2013-2021 Practice Greenhealth Environmental Excellence Awards