

SUSTAINABLE PERIOPERATIVE CARE

Project Charter Summary

REDUCE & MANAGE WASTE

Device Remanufacturing

The healthcare sector has become **reliant on single-use materials**, which represent a linear supply chain in which **products are manufactured, used once, and then discarded**.



PROJECT CHARTER: See the full version of the project charter for more change ideas, details, and a complete list of references.

This type of arrangement is unsustainable on many fronts: single-use devices are vulnerable to supply chain disruptions, and contribute to environmental degradation by **depleting natural resources and generating waste and emissions**.



This linear model can be disrupted by increasing the number of times a disposable device can be used, keeping products in circulation for as long as possible. **Health Canada approves commercially remanufactured devices** according to the same standards by which it assesses virgin (never used) devices.

The **Stryker 2022 Comprehensive Report** (p. 52) offers a life cycle analysis of five of their most popular remanufactured devices, with a reduced carbon footprint attributable to their not requiring production and manufacturing of new materials.

GOAL: Where possible, submit single-use devices for reprocessing and purchase reprocessed devices

PROJECT SCOPE: All eligible disposable devices used for surgery, and the departments that purchase and use them

EMISSIONS SCOPE: Scope 3 (emissions arise from activities or products related to health sector activities, but not owned or controlled by your organization)

ESTIMATING IMPACT

ACTIVITY/OUTCOME METRIC

- A. Number of remanufactured devices purchased
- B. Number of virgin devices purchased

- Source from vendor data, procurement data, or a self-audit.
- Weight of plastic devices diverted from landfill/treatment can be converted into waste disposal costs, and added to cost savings



RELATED ENVIRONMENTAL METRIC

- C. Available metrics (see below)
- $$(A \times C) + (B \times C)$$

- For EP catheters: **remanufactured devices cost 0.61 to 0.87 kg CO₂e**, compared to **1.53 to 1.75 kg CO₂e for OEM devices**.
- Per Stryker, packaging for remanufactured devices tends to be 13% - 41% less than for OEM devices.
- Energy for remanufacturing is **15% of what would be required for OEM production**.
- Consideration: only a portion of what is collected in bins is eligible for reprocessing; other components are recycled (with associated emissions).

ENVIRONMENTAL IMPACT

Estimation of total impact

- This estimates total emissions associated with your devices. It should reduce with an increasing proportion of remanufactured devices.
- Alternatively, you can count single-use device bins reprocessed per month, and multiple by 1.5 kg (average weight per bin) to calculate the weight of waste diverted.
- Use the **Natural Resources Canada Greenhouse Gas Equivalencies Calculator** to translate results to stakeholders.

Root Causes and Change Ideas for Remanufactured Devices



PLAYBOOK: View the playbook for other perioperative sustainability opportunities and resources.



VIDEO: Device Remanufacturing with Dr. Laura Donahoe
VIDEO: Device Remanufacturing with Laurie Thomas

There is a lack of knowledge surrounding the incentives of participating in device remanufacturing programs, and misconceptions that it is costly or unsafe (with respect to infection prevention or liability) to do. Uninformed vendors may not be reliable sources of information on remanufacturing.

EDUCATION & AWARENESS

- Develop educational materials (e.g., posters, rounds, letters, or memos) on:
 - The environmental impacts of single-use devices.
 - The cost savings and environmental benefits of remanufactured devices (be sure to address concerns and misconceptions about remanufacturing).
 - The [array of devices eligible for remanufacturing](#).
- Share educational materials with department managers with decision-making power over device procurement.
- Ensure staff know how to correctly dispose of devices to be remanufactured (e.g., placing in the correct bin, not cutting the cord on energy devices, etc.)

There are concerns about the safety and efficacy of remanufactured devices, or that there may not be enough devices on site to carry out necessary procedures if some are sent away for reprocessing.

CLINICAL WORKFLOW

- Ensure that your supply model accounts for devices in-house and out for reprocessing, such that there are enough devices in circulation that there will always be ample supply ready for use.

Some hospitals provide both disposable and reprocessed materials to staff, which does not maximize cost savings or environmental impact. Many do not have a contract with a vendor that remanufactures devices (for pick-up or purchasing).

FINANCES & PROCUREMENT

- Create a business case that indicates long term cost-savings or neutrality.
- Transition to 100% purchasing of remanufactured items to optimize costs, incentives, and environmental impact.
- Connect with a vendor representative that has a request for proposal with your hospital's existing surgical device provider to support the transition to procuring remanufactured devices.
 - If your hospital's medical device supplier does not have a request for proposal, the hospital will need to renegotiate the contract or change to a supplier that offers one with the vendor.

There are concerns that a new waste stream would require extra staffing or physical space that is unavailable.

INFRASTRUCTURE

- Explore opportunities for on-site reprocessing, as well as pick-up and off-site reprocessing.