

SUSTAINABLE PERIOPERATIVE CARE

Project Charter Summary

SUBSTITUTE REUSABLE ALTERNATIVES

Reusable Laryngeal Mask Airways (LMAs)



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

Laryngeal mask airways (LMAs) are essential devices used to facilitate airway management during general anesthesia, but single-use devices are a common source of waste.



A [life cycle assessment](#) found that a reusable LMA (recommended for 40+ uses) produces 7.4 kg CO₂e, while the equivalent 40 single-use LMAs produce 11.3 kg CO₂e. Reusable devices must be washed and sterilized, but the environmental impacts of this are outweighed by [the known impacts of single-use LMAs](#) on human health, ecosystems, and resources.

In addition to environmental savings, reusable LMAs can also make hospitals less vulnerable to supply chain shortages, and result in cost-savings over relatively short time horizons. More more information, see the [Ontario's Anesthesiologists primer on reusable LMAs](#).

GOAL: Transition from single-use to reusable laryngeal mask airways

PROJECT SCOPE: Institution-wide (prioritizing operating rooms, where the vast majority of LMAs are used)

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

- 1A. Number of single use LMAs disposed of per month and
- 2A. Number of reusable LMAs disposed of per month

- Source from procurement data, the medical device reprocessing department, or a self-audit.

RELATED ENVIRONMENTAL METRIC

- 1B. 0.28 kg CO₂e/kg per disposable LMA and
- 2B. 7.4 kg CO₂e/kg per reusable LMA

- Source: [Eckleman et al., 2012](#) (data from a US center which may be imprecise in Canadian contexts).
- Considerations:
 - While individual single-use LMAs have a smaller footprint than reusables, each reusable LMA can generally be used a minimum of 40 times (with a lower carbon footprint than 40 single-use LMAs).

ENVIRONMENTAL IMPACT

Estimation of total impact in kg CO₂e

- Estimate the kg CO₂e expended for each type of LMA (#1A x #1B + #2A x #2B). There should be a reduction in this total, over time, with an increasing proportion of reusable LMAs if recirculated correctly.
- Use the [Natural Resources Canada Greenhouse Gas Equivalencies Calculator](#) to translate your results to stakeholders.

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Root Causes and Change Ideas for Reusable Laryngeal Mask Airways (LMAs)



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



VIDEO: Reusable LMAs with Dr. Melissa Ho

Misinformation exists that disposable LMAs provide superior infection prevention and control

EDUCATION & AWARENESS

- Create an educational campaign and materials with data supporting the safe use of reusable LMAs, ensuring that the avoidance of inadvertent disposal is prioritized.
 - Resources: see the [Ontario's Anesthesiologists primer on reusable LMAs](#) and Dr. Melissa Ho's recorded [CASCADES presentation](#).
- Identify site champions who can promote the change to reusable LMAs, and seek buy-in from the anesthesia department and staff.

Staff may mistakenly dispose of reusable LMAs they believe to be single-use, especially where there is a mix of both, in part because single-use devices are more prevalent.

CLINICAL WORKFLOW

- Create processes to prevent incorrect disposal of reusable LMAs:
 - Inform new staff and trainees that the LMAs on hand are reusable, in case this is unfamiliar to them.
 - Add reusable LMAs to your site's Surgical Safety Checklist or Sustainability Moment, until a habit is formed to not dispose of them.
 - Implement a self-monitoring system to ensure that LMAs are not incorrectly disposed of (e.g., using regular counts or waste audits).
 - Consider eliminating all LMA disposal in the OR, such that MDRD determines the post-use pathway for reusable and single-use devices.
- If needed, transition using a hybrid model during a short training period (i.e., 3 months) during which both varieties of LMA are available.

Hospitals may be contracted to vendors who do not have reusable LMAs, and vendor representatives often promote single-use devices. The upfront cost of reusable LMAs is higher than for single-use devices.

FINANCES & PROCUREMENT

- Purchase reusable LMAs instead of disposable LMAs, ensuring adequate inventory to meet clinical needs. New contracts may not be needed: check with existing vendors to see if they also might sell reusable devices.
- Create a business case to show the cost savings of purchasing reusable LMAs compared to disposable alternatives.
 - [One US Study](#) calculated the cost per use of a reusable LMA as \$8 (including cleaning and labour), compared to \$9.60 for a disposable LMA. Increasing reuse cycles further enhance savings.
 - In Toronto-area hospitals, [the unit cost of a disposable LMA is estimated at \\$7.83 compared to \\$350 for a reusable LMA](#) (estimated cost of \$6 - \$11.25 per use depending on facilities and number of use cycles).
- Consider switching to other reusable OR devices, to reduce per-unit processing expenses by sterilizing them simultaneously.

The Medical Devices Reprocessing Department (MDRD) has limited capacity, and a robust process is needed to put reusable LMAs back into clinical circulation in a timely fashion.

INFRASTRUCTURE

- Establish a standardized pathway, in collaboration with MDRD, to ensure successful transportation, reprocessing, and instrument tracking.
- Audit inventory and operating room procedures on a regular basis to [ensure that reusable devices are reused](#) to the greatest and safest possible extent.
- Have a dedicated receptacle in the operating room (e.g., on the case cart with other reusable items for sterilization) for reusable LMAs post-use.