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DESCRIPTION

Anesthetic gases contribute 5% of a hospital's total greenhouse gas (GHG) emissions. Desflurane, an inhaled anesthetic, has up to 20 times the environmental impact of alternative gases. As part of Humber River Health's (HRH) sustainability initiatives, desflurane's usage in HRH's operating rooms (OR) was addressed through the following areas:

- Carbon Footprint and Usage
- Economic Implications
- Clinical Differences over agents like Sevoflurane

The GHG emissions with 1 hour of equivalent delivery of desflurane is comparable to driving 370 km (a round trip from Toronto to Buffalo) as opposed to 6.5 km for sevoflurane. These factors and supporting literature shaped HRH's objectives.

OBJECTIVE

To reduce utilization of desflurane with the definitive goal of removal from HRH formulary.

ACTIONS TAKEN

2021:

- Flagged as a sustainability initiative
- Literature comparison and medication utilization review conducted

2022:

- Stakeholder meetings to increase engagement
- Disseminated education via HRH newsletter
- Grand Rounds Presentation by anesthesiologists affiliated with the Ontario Environmental Sustainability Working Group

- Intra-Departmental survey completed to understand individualized practice

2023:

- Formed Pharmacy Green Sustainability Committee
- Feedback loop with anesthesiology on utilization trends
- Explored strategies like formulary restriction or segregating vials

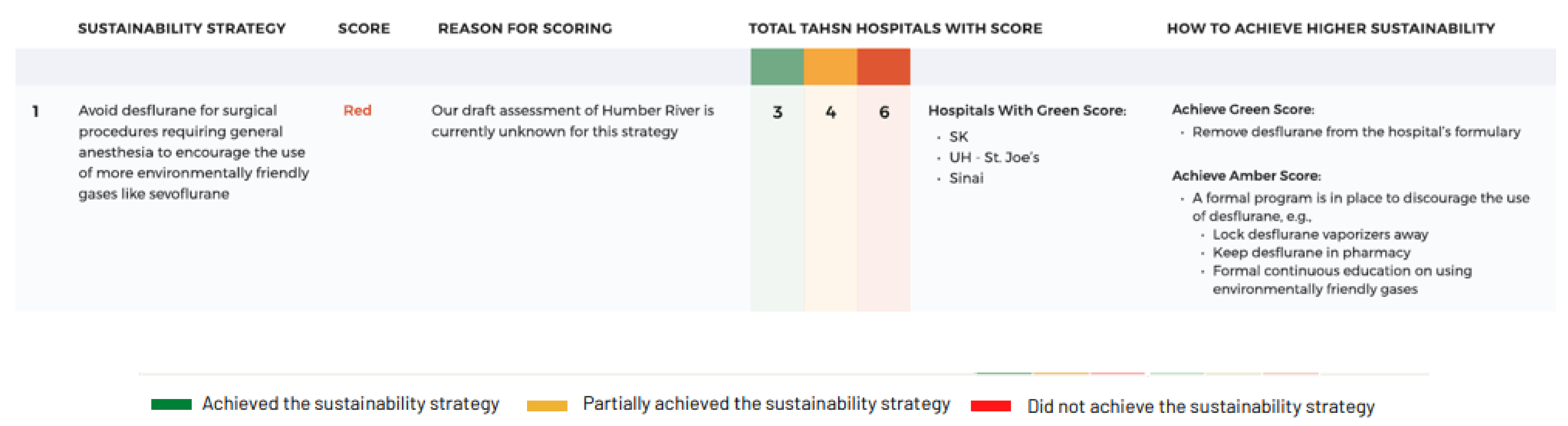
2024:

- Benchmarked to identify organizations with successful formulary removal
- Re-surveyed HRH anesthesiologists to address barriers

Figure 1. Toronto Academic Health Science Network (TAHSN) Sustainable OR scorecard in 2021.

Input across 13 TAHSN ORs was provided through a benchmarking exercise. The results are shown in this scorecard which identified Desflurane removal as a green strategy opportunity at HRH.

Reference: <https://www.sustainablehealthsystems.ca/sustainable-operating-room-scorecard>



| Fiscal Year | 2021-2022 | 2022-2023 | 2023-2024 |
|---|----------------|----------------|----------------|
| Desflurane Vials Used | 270 | 196 | 92 |
| Cost | \$35,000 | \$25,480 | \$11,960 |
| CO2 | 305 tonnes | 221 tonnes | 102 tonnes |
| CO2 footprint measured as a year's worth of trash from... | 305 households | 221 households | 102 households |

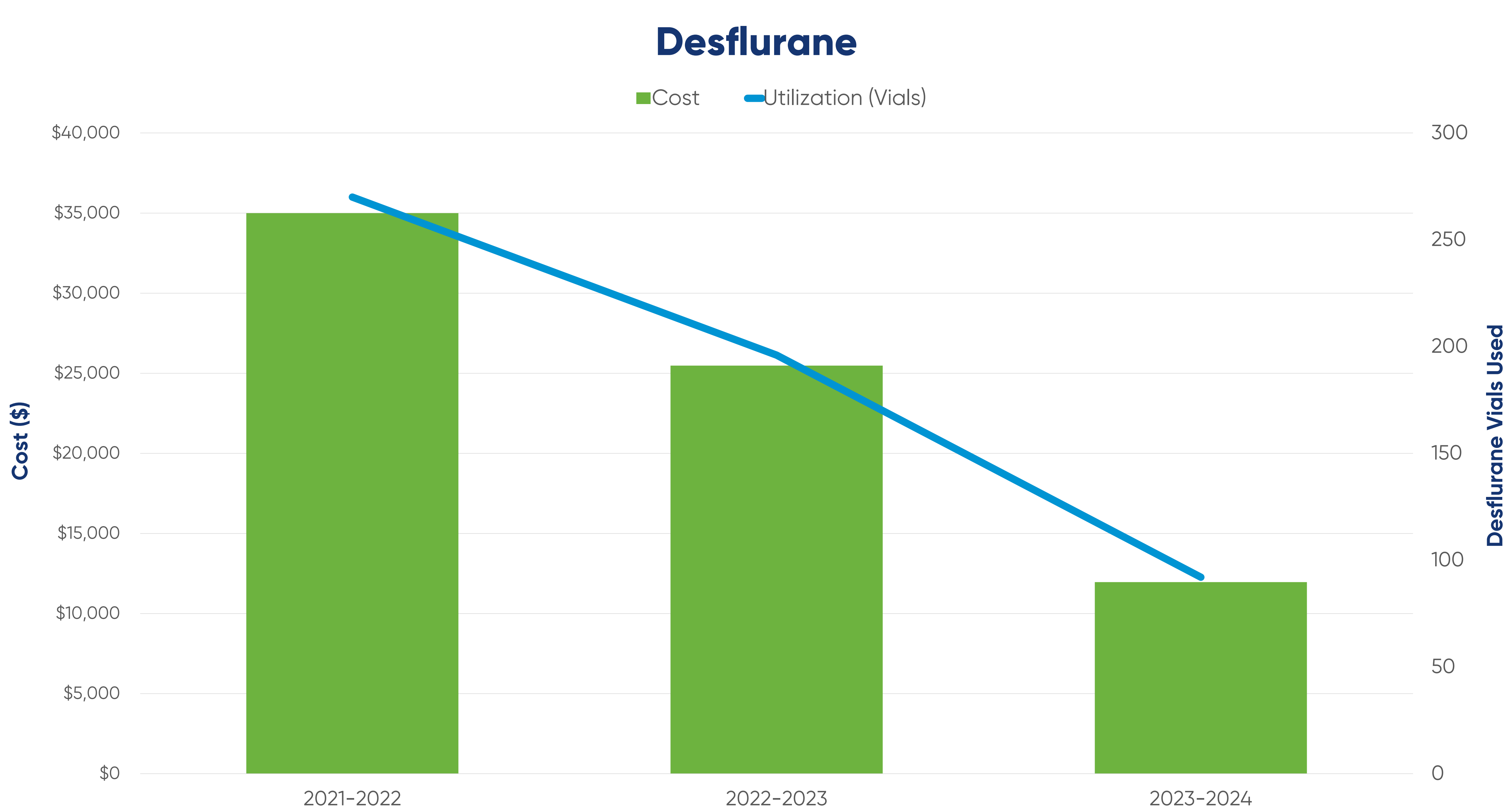


Figure 2. A snapshot of Desflurane data over the last three fiscal years.

HRH cost and carbon footprint declined as a result of decreased Desflurane utilization from 2021 to present day. HRH will continue its efforts to reduce utilization and promote sustainability.

SUMMARY OF RESULTS

- Carbon Footprint and Usage – HRH decreased desflurane utilization by 50% over the last fiscal year.
HRH will strive to align with the 26 Ontario hospitals that successfully removed Desflurane off formulary.
- Economic Implications – Using equipotent concentrations, Desflurane is four times more costly than Sevoflurane.
- Clinical differences over alternatives- There is no significant clinical benefit of desflurane over alternatives. Removal from formulary is endorsed as best practice through guidance and literature from Canadian and American Anesthesia Society, Cascades, and Choosing Wisely Canada.

LESSONS LEARNED

Increased awareness, interdisciplinary collaboration and clinician engagement are necessary to implement change in individual practice with the departmental goal of transitioning towards greener anesthesia use.

