

Reducing desflurane usage at the Sunshine Coast University Hospital

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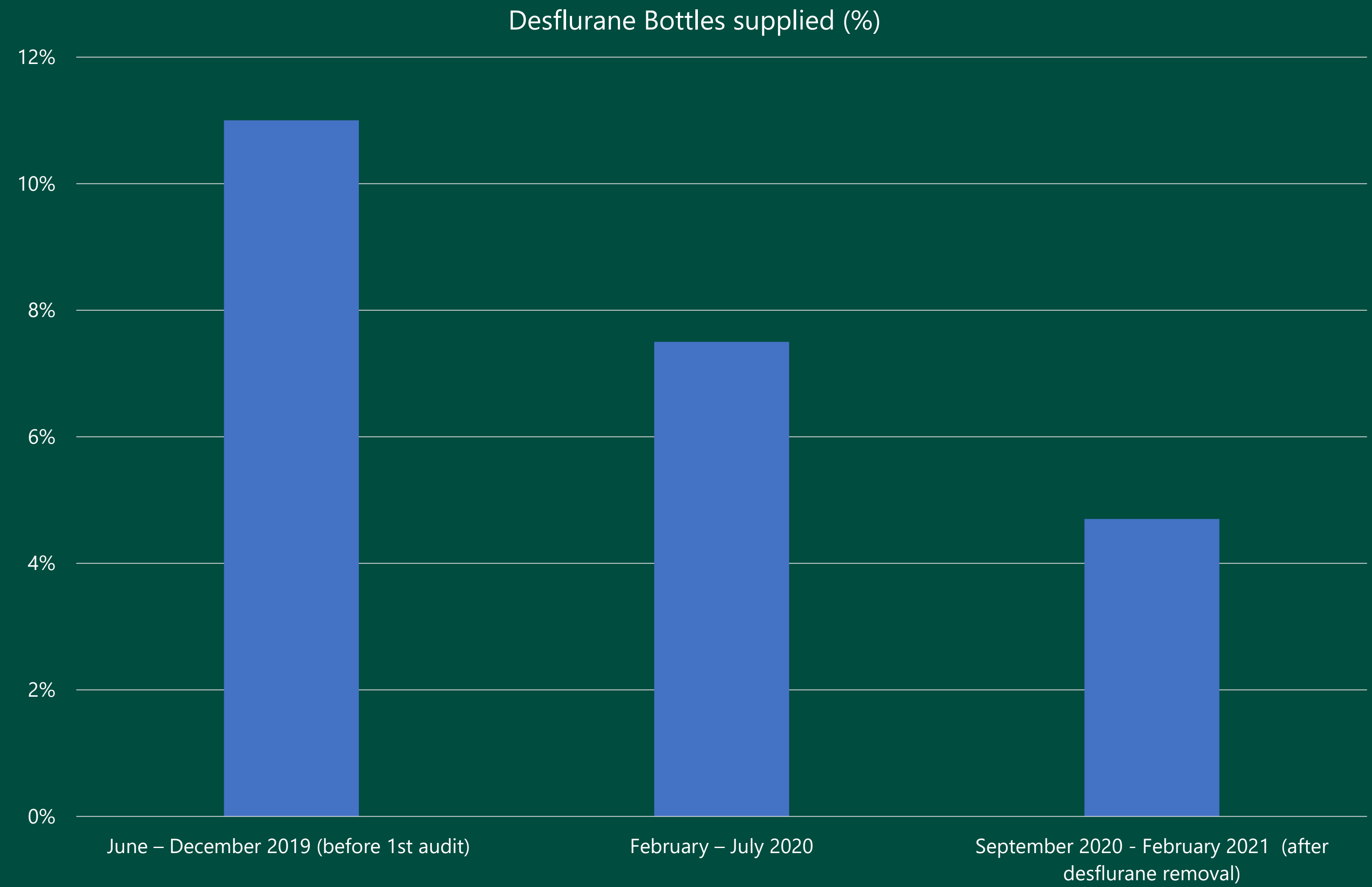
Background

- 7% of Australia’s total carbon footprint can be attributed to the healthcare industry of which 44% of emissions originate from hospitals
- A significant proportion of this comes from volatile anaesthetic gas use.
- Desflurane is an inhaled halogenated anaesthetic agent that has purported benefits for quicker emergence and recovery from anaesthesia which has led to its growing usage
- However, when compared to other anaesthetic agents, desflurane has a significantly larger global warming potential. A standard bottle (240mL) of desflurane has a CO₂ equivalent of 886kg.
- Comparatively, a standard bottle of sevoflurane (250mL) has a CO₂ equivalent of 49kg.
- Desflurane on average costs \$437 per bottle compared to \$99 for a bottle of sevoflurane

Methods

- The first education outlining the environmental impact of desflurane was presented to the anaesthetic department in December 2019.
- After this session the department agreed to remove desflurane from the anaesthetic workstations and make it ‘request’ only. This change was implemented August 2020.
- Purchasing data of desflurane and sevoflurane (the two anaesthetics gases used in our department) were collected from 3 periods –
 - June 2019 to December 2019 (prior to the education session)
 - February 2020 to July 2020 (prior to desflurane removal)
 - September 2020 to February 2021 (after desflurane removal).
- Savings were measured from comparing the proportion of desflurane bottles used when compared to the June-December 2019 period in both CO₂ equivalent and dollar cost savings.

Through education and the removal of desflurane from anaesthetic workstations, 29 tons of CO₂ equivalent was saved from being released into the environment



Results

- In the June 2019 – December 2019 period desflurane represented 11% of the total bottles of volatile anaesthetics used.
- This reduced to 7.5% in the second period of February 2020 to July 2020 and there was a further reduction to 4.7% in September 2020 to February 2021 after removal of desflurane from anaesthetic workstations.
- This resulted in a CO₂ equivalent saving of 29 tons and a dollar cost saving of \$9510 when compared to usage rates in 2019.

Discussion

- We have demonstrated both the environmental savings and dollar cost savings of reducing desflurane usage in anaesthetic departments through education and changing accessibility to the agent.
- Our analysis assumed desflurane was substituted for sevoflurane and does not consider regional or total intravenous anaesthesia as an alternative which have far less global warming potential and would represent a far greater reduction in environmental footprint.

Future

- To continue the reduction of the use of desflurane by removing it from the hospital formulary, following the lead of other hospitals around Australia.

1 hour of surgery using desflurane is equivalent to... driving 200–400km

1 hour of surgery using sevoflurane is equivalent to... driving 5–10km

<https://rcoa.ac.uk/patient-information/about-anaesthesia-perioperative-care/your-anaesthetic-environment>