

Withdrawal of national desflurane contract in Wales

This document has been prepared by the Welsh Anaesthetic Green Network (WAGN), with support from the All Wales Prescribing Advisory Group (AWPAG) and the All Wales Therapeutics and Toxicology Centre (AWTTC), and has subsequently been endorsed by the All Wales Medicines Strategy Group (AWMSG).

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All Wales Medicines Strategy Group, Welsh Anaesthetic Green Network (WAGN). Withdrawal of national desflurane contract in Wales. December 2023.

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This strategy is endorsed by the Welsh Anaesthesia Board and supports statements by the Royal College of Anaesthetists and Association of Anaesthetists. It will bring the policy for the NHS in Wales in line with both NHS Scotland and NHS England who have already agreed to remove desflurane from their formularies^{1,2}. It is also in line with the NHS Wales Decarbonisation Strategic Delivery Plan.

Background

Anaesthetic gases are potent greenhouse gases and make up 2% of the overall carbon footprint of the NHS³. Sevoflurane and desflurane were introduced in the early 1990s. Due to its pharmacokinetic properties desflurane was encouraged for patients with a high body mass index (BMI), having long surgery or requiring a quick wake-up for neurological reasons. Sevoflurane is the most commonly used vaporized anaesthetic due to its superior inhalational qualities.

Sevoflurane has 130 times the global warming potential (GWP) of carbon dioxide and an atmospheric lifespan of 1.1 years, whilst desflurane has a GWP 2540 times that of carbon dioxide and an atmospheric lifespan of 14 years⁴. The gases have a different potency: to achieve the same depth and duration of anaesthesia three times the volume of desflurane is required compared with sevoflurane. In addition, each bottle of desflurane costs 50% more than a bottle of sevoflurane⁵.

Desflurane was favoured for its quick wake up, in particular in patients having long surgery or with a high BMI. However, the reported benefits are small and this is now achievable using total intravenous anaesthesia (TIVA). It is widely recognised that the environmental harm of using desflurane outweighs the clinical benefit^{5,6}.

Desflurane in Wales

Use of desflurane in Wales has declined since 2019, when the Welsh Anaesthetic Green Network launched 'Project Drawdown' to educate anaesthetists about environmental harm. A re-launch of the project in 2021 has seen four health boards and an additional two hospitals completely remove desflurane from use. Just three sites regularly use desflurane in Wales.

Despite desflurane making up just 1.5% of volatile anaesthetic agents used by volume in Wales it makes up 21% of the carbon footprint from volatile anaesthetic agents. This highlights the ongoing importance of the need for complete cessation of its use. Annually, 128,584 kgCO₂e can be attributed to desflurane use in Wales. This is equivalent to driving 316,000 miles in a car⁷, again highlighting the need for the complete cessation of desflurane use.

Figure 1: Volatile anaesthetic carbon footprint in Wales broken down by vapour, showing the decline in desflurane use and pattern of total volatile carbon footprint's close linkage to desflurane

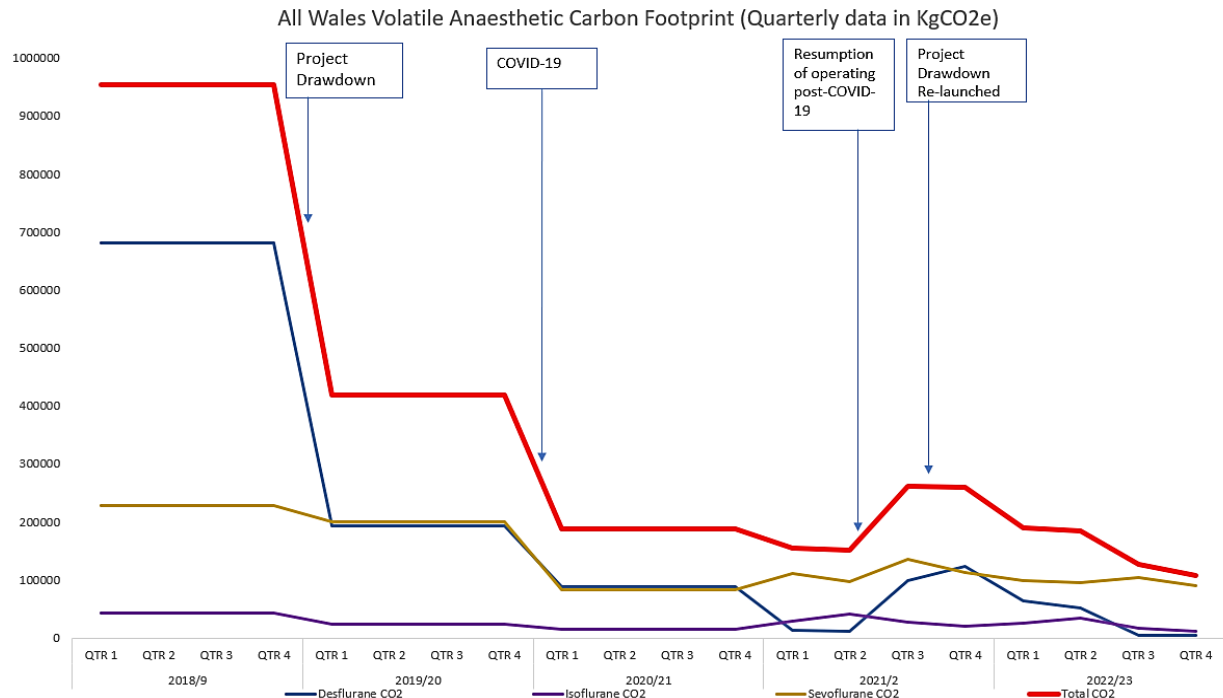


Figure 2: Number of bottles of desflurane purchased by health board

| Health board | 2022/2023 | Final quarter 2022/2023 |
|---|-----------|-------------------------|
| Aneurin Bevan University Health Board* | 24 | 0 |
| Betsi Cadwaladr University Health Board* | 0 | 0 |
| Cardiff and Vale University Health Board | 72 | 0 |
| Cwm Taf University Health Board* | 36 | 0 |
| Hywel Dda University Health Board | 6 | 6 |
| Swansea Bay University Health Board* | 0 | 0 |
| * Health boards which have stopped using desflurane within the past 6 months. | | |

The wider picture

The Royal College of Anaesthetists wrote to NHS England in June 2022 stating: “now is the time to stop the use of desflurane completely. This is driven by the knowledge that there are alternative drugs and techniques that are significantly less environmentally harmful, with no evidence that desflurane provides better patient outcome when compared to its alternatives”⁸.

NHS Scotland removed desflurane from its formulary in January 2023 and NHS England are decommissioning desflurane by January 2024^{1,2}.

The European Commission have proposed a complete ban on the use of desflurane, unless there is evidence that no other anaesthetic is suitable. This is likely to be implemented in January 2026⁹ and if it is, it is unlikely that desflurane production will continue.

Volatile gas capture technology has been developed and is being tested in several sites in the UK, although none in Wales at present. This process requires capture of exhaled anaesthetic gases, storage and transport to central sites where large volumes can be processed for re-use. The re-capture is imperfect – one study showed just 25% of administered desflurane was re-captured¹⁰, and the small volumes captured make re-processing challenging. Therefore it is deemed unsuitable to mitigate against emissions from desflurane¹¹.

Recommendations

The Welsh Board of the Royal College of Anaesthetists supports the termination of the use of desflurane in Wales, given its disproportionate environmental harm, lack of true clinical benefit, decline in use and financial burden.

The Welsh Anaesthetic Green Network recommends the following actions:

- Give immediate notice to terminate the All Wales purchasing licence for desflurane.
- Stop the purchase of desflurane at a national level through NHS Wales Shared Services and Procurement.
- Safe and environmentally responsible disposal of remaining desflurane supplies using the latest available technology.
- Return all desflurane vaporizers to Baxter Healthcare Corporation.
- Any hospital wishing to continue use of desflurane will be required to negotiate on an individual level with Baxter, restricted to patients with specific indications.

Equitable alternatives to desflurane such as total intravenous anaesthesia (TIVA) and sevoflurane are available, supported by regional anaesthesia techniques.

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