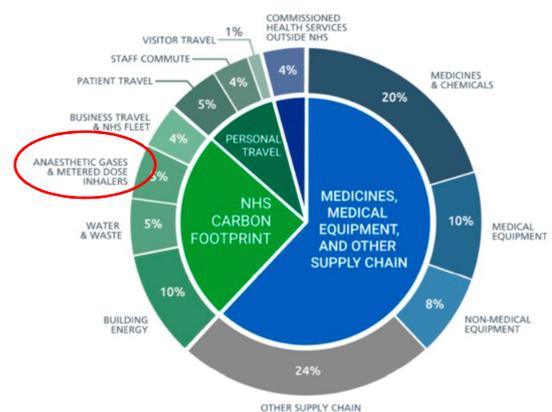


# ELHT Anaesthetic Department GREEN NEWSLETTER APRIL 2021

This is the first edition (with hopefully many more to come) of the ELHT Anaesthetic Department Green Newsletter – welcome! Our most recent audit meeting displayed a number of projects looking into the environmental impact that we as a department and Trust have, and how we can address this and try to reduce our carbon footprint. It has highlighted an interest in this area amongst many of our colleagues and therefore we hope with this newsletter we can keep you updated on progress, future projects and how we can all become more environmentally friendly!

Firstly, congratulations are in order to Dr Jason Lie who has been elected as the department’s first Sustainability Lead. He is conducting multiple projects and encouraging the involvement of trainees to help in the huge challenge of addressing our environmental impact.

Some background as to why all of this is important; the Greener NHS campaign was formed in 2020 to tackle the “**Climate Health Emergency**” which currently leads to 36,000 deaths in the UK annually due to air pollution that is linked to heart disease, stroke and lung cancer. NHS England is estimated to contribute 4-5% of the country’s total carbon footprint, with anaesthetics gases contributing to 5% of this! A target has been set for the NHS to achieve a **net zero carbon footprint by 2040** – so we better get to work!



This month’s newsletter will summarise some of the current, ongoing “green” projects and any future project ideas.



## REUSE

We are encouraging staff to wear personal, reusable theatre hats to avoid waste!

## REDUCE

### Greening the Anaesthetic Room Project

[Dr Hirst, Dr Mangham and Dr Lie 2021]

Climate change is widely reported on and researched. We all know that it is important and a threat to our planet and global health. But do we all know the impact that our inhaled anaesthetic agents have on the environment? They are halogenated compounds, and like carbon dioxide, methane and nitrous oxide, behave as greenhouse gases (GHG). Greenhouse gases make the earth warmer by trapping energy inside the atmosphere. All inhaled anaesthetic agents are damaging to the environment, but desflurane is especially bad. It has a Global Warming Potential (GWP<sub>100</sub>) of 2540, in comparison to Sevoflurane which has a GWP of 130 (and for reference, CO<sub>2</sub> has a GWP of 1).

#### **Aim:**

To reduce use of desflurane in theatres in order to reduce our emissions.

#### **Methods:**

- In January 2020, desflurane was removed from the anaesthetic machines and stored separately but remained available on request.
- Data were retrospectively collected over a four-year period from pharmacy including number of bottles of sevoflurane, desflurane and propofol ordered on a monthly basis from February 2017 – February 2021, along with their cost.
- Monthly CO<sub>2</sub> equivalent (CO<sub>2</sub>e) calculated based on the amount of anaesthetic agent ordered.

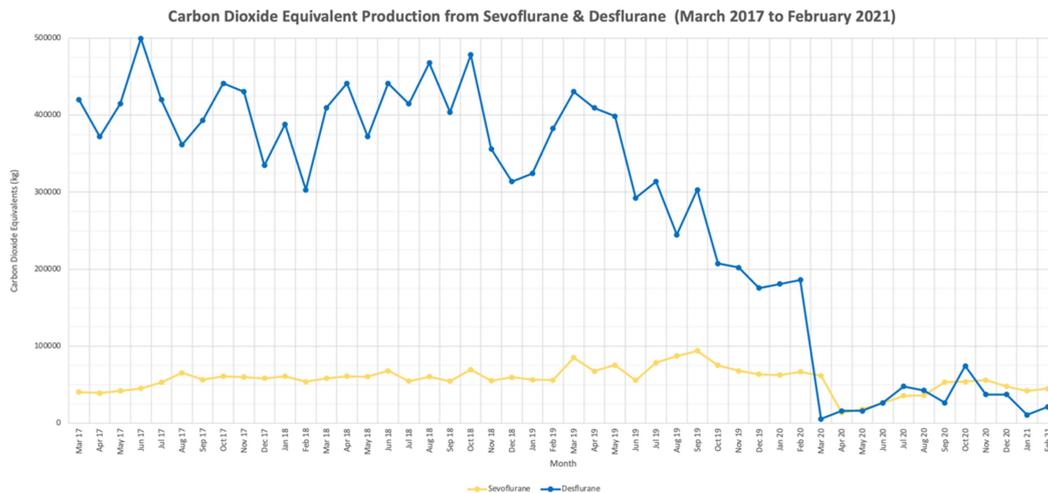
#### **Results:**

In a 12-month period over 2020/21, ELHT has dramatically reduced its use of desflurane. Compared with a 12-month period in 2017/18 we have:

- Saved **4,417 tonnes** of CO<sub>2</sub>e (carbon dioxide equivalent).
- Reduced CO<sub>2</sub>e by **84%**.
- Reduced CO<sub>2</sub>e on average by 380,298kg/month – which is equivalent to driving 943,667 miles/month.
- Made significant cost savings - in total **£100,390** saved over 12 months.



(Findings partly due to change in practice, favouring sevoflurane over desflurane and also a by-product of the COVID-19 pandemic and reduced operating capacity)



## What now?

Our recommendation for the future is to –

- Continue to keep desflurane off the anaesthetic machines routinely and encourage use only when indicated.
- Encourage use of low flows and turning gas flow down when disconnected from patient.
- Consider using regional anaesthesia where possible.
- Produce and distribute posters to remind people of the environmental impact of inhaled anaesthetic agents.
- The environmental impact of TIVA is still under investigation.

Although operating levels will hopefully return to normal over the next year, our emissions need not return to previous high levels. Our project shows that a simple intervention can produce a dramatic reduction in CO<sub>2</sub>e emissions by 4,563 tonnes.

We have now also managed to reduce our stock level of desflurane to 18 bottles only.

Overall, the message is: **well done, and keep going!**



## The Nitrous Oxide Project

[Dr Khosla, Dr Shahid, Dr Barnes and Dr Lie 2021]

Nitrous oxide (N<sub>2</sub>O) unfortunately has a significant impact on the environment and is therefore a major target for attempting to reach net zero carbon emissions by 2040. The Nitrous Oxide Mitigation Project was launched in 2021 in Lothian, in association with greener NHS, and identified that their trust usage of nitrous oxide could be significantly reduced without impacting clinical practice.

We have extrapolated this idea to ELHT to review our own usage of N<sub>2</sub>O, the project highlights are shown in the following tables:

AIMS
Evaluation of the size and suitability of the N <sub>2</sub> O manifold to current clinical requirements at ELHT.
Identifying areas of waste i.e., leakage in the storage and distribution infrastructure.
Evaluation of our environmental impact in relation to N <sub>2</sub> O use.

RESULTS
<b>Nitrous oxide turnover at RBH of 8 million litres in 24 months.</b> This manifold use is hugely disproportionate to clinical practice, suggesting a <b>significant system leak</b> .
<b>Emergency NO cylinders</b> are usually changed having been unused i.e., largely <b>redundant</b> .
Low bank turnover at Lancashire women's centre – maybe too large for serviced area.
Production of 2500 Tonnes of CO <sub>2</sub> equivalents (CO <sub>2</sub> e) per year due to N <sub>2</sub> O from RBH.
Over 50% of survey respondents reported to use nitrous oxide less than monthly and for <30 minutes at a time.

METHODS
Inspection of the nitrous oxide manifolds at each ELHT site.
Review of logbooks tracking cylinder turnover for the period Feb 2019 – Feb 2021.
Review of anaesthetic machine logbooks for nitrous oxide usage over the period of one week.
Survey of ELHT consultant and staff grade anaesthetists to review their nitrous oxide usage habits over the past year.



Given these findings our initial recommendation is for **isolation of theatres from piped NO at RBH** to rule out a leak at this end of the pipelines. This is going to take place at the end of April or the beginning of May.

The next step is to repeat methods and analysis in July 2021. If our results show that manifold turnover remains excessively high despite isolation of theatres, we then need to consider how/if it is possible to investigate a leak somewhere else along the pipeline. Or an alternative recommendation of considering decommissions and shutdown of the N<sub>2</sub>O manifold at RBH.

Further results and recommendations from the ongoing Nitrous Oxide Project will be presented at audit meetings and published in future Green Newsletters to keep you updated!

## RECYCLE

### RecoMed

A company that specialises in recycling face masks and breathing circuits, it is the first scheme of its kind in Europe, and provides collection bins and delivers shredded plastic to specialist recyclers. ELHT is currently on the waiting list!

### Recycling Project – Domestic waste

[Dr Greenwood, Dr Barnes, ODP Walker and Dr Lie 2021]

We are currently making plans to improve recycling within the department and theatres. We will be sending out a survey for all theatre staff to assess their views on recycling for domestic and clinical waste.

We propose to do a QI project to investigate how much waste we could potentially recycle by creating 3 different bags – general waste, paper and plastic - for use in the anaesthetic department and coffee room, and measure how much waste we are able to recycle over a period of 1 month. Hopefully following this we can put some permanent recycling systems into place in the department!

### SteriMelt

Mrs Judith Salaman is currently looking into this non-woven polypropylene sterile wrap system. SteriMelt is a world first technology for the sustainable recycling of clinical sterilisation wrap used in healthcare across the world. It turns a disposal cost into revenue and reduces wrap density by up to 85%.



## Other Recycling news!

### Sustainable Procurement

ELHT has signed up to the Sustainable Procurement towards Zero-Waste Operating Theatres project initiated by University Hospitals Bristol & Weston NHS Foundation Trust (UHBW) & 7 other Trusts.

## Future Projects

### Entonox & Central Birth Suite

Side project from the Nitrous Oxide Project - looking into our nitrous oxide level on Central Birth Suite, efficiency of the delivery of entonox and increase awareness of the environmental impact of nitrous oxide amongst expecting women.

### Project Drawdown

Continue our collaboration with Wales Environmental Anaesthesia Network (WEAN) with future projects looking into propofol and inhalational gases usage.



## **Volunteers Wanted!!!!**

We would like to introduce the idea of “Green Champions” – ideally one or two in each department (clinical and non-clinical) to act as a role model, point of contact and a local expert who can feed back more ideas on how we can save money and help the environment. If you feel you can help, please e-mail me at [jason.lie@elht.nhs.uk](mailto:jason.lie@elht.nhs.uk) – your support will be very gratefully received!

We are interested in hearing about any new “green” articles or green projects you have undertaken, please email [jason.lie@elht.nhs.uk](mailto:jason.lie@elht.nhs.uk)!

That’s all for the first edition, but don’t worry there will be more in the future!

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