MEDICAL GAS CONTROL

Significant Reductions in Ambient Nitrous Oxide at the Royal Victoria Infirmary Newcastle

Key Findings

- Significant reductions in ambient nitrous oxide levels
- Massive safety improvement for Midwifery staff
- Demonstrable reduction of environmental nitrous oxide
- Ambient levels of nitrous oxide well below the COSHH standards for staff

Background

Anaesthetic gases account for 2% of NHS carbon emissions and are a key focus in the NHS net zero agenda, in particular Scope 1 and directly controlled emissions.

All NHS trusts throughout England have now published green plans which outline their objectives in reducing their carbon emissions across all scopes of the net zero agenda.

Newcastle Upon Tyne Hospitals were the first NHS Trust in the UK to declare a climate emergency. In September 2021 they were the first to deliver a baby (Rosie) using climate friendly gas & air via BPR Medical's Ultraflow analgesic demand valve system and the Medclair MDU (mobile destruction unit which captures exhaled nitrous oxide, breaks down the chemical components and converts it into nitrogen and oxygen).

Today the Trust has 4 MDUs and a central destruction unit at the RVI (Royal Victoria Infirmary) hospital, which:

• Supports staff safety for those who oversee 6,000 births each year

• Offers women a choice of using effective pain control whilst in labour

> What this means is we can continue to use nitrous oxide as an analgesic, provide a safer environment for our staff and know that we are helping the environment as well

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Reception from Midwifery Team

On implementation, Jill Haves, Midwife Manager- Newcastle Birth Centre, commented, “When we initially implemented the units, the thinking was that it’s a large piece of equipment and something else for us to manage. However, when the news reports started to emerge about the physical effects on us as midwives it was really well received after that”.

There were many considerations when embedding the technology, and to make it manageable for the midwifery team, including women that are moving around, manoeuvring around birthing couches and birthing pools being used a lot. Jill added, “We use the equipment and make it work for us, one of the things I quite like about it is we can store accessories on the top of it which is really useful and we can move it about depending on who is using it in the room”.

The Midwifery team were mindful of trip hazards, Jill mentioned, “Because of the way the tubing works, we can make it as long or as short as it needs to so it’s really good”.

Ultraflow analgesic demand valve system with MDU in one of the delivery suits at RVI

Addressing Nitrous Oxide

From the outset of scoping and implementing the MDU technology, the key objective for the team was reducing carbon emissions caused by exhaled nitrous oxide, however as Katy Whitehouse, Consultant Anaesthetist points out, it became much more, “What initially started as a sustainability journey has also become something that’s important to maintain the safety of our staff. And to ensure we can deliver Entonox whilst keeping our ambient nitrous oxide level within the COSHH standards. Ensuring the continuity to deliver excellent pain relief for women and getting that same level of care whilst maintaining safety for our staff which is really important”.

On the back of the baby Rosie success the team wanted to measure the effectiveness of the technology, “We wanted to explore how effective it was and to ensure it was reducing our nitrous oxide levels as a surrogate for the amount of nitrous oxide we were releasing into the environment. At that point it became apparent that this was not just a sustainability issue but this is a health safety issue as well”.

“Entonox is an effective pain killer and I speak from personal experience. It has years and years of data behind it to support its safe and effective use in labour. There are other pain relief options available but none that fit the same need for use within low-risk mothers, high risk women, doesn’t require the presence of an anaesthetist and can be used in the community. So, there’s lots that nitrous oxide can do which others can’t”.

> “Not just a sustainability issue, but this is a health and safety issue as well”

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Efficacy of Technology

It was important for the team at RVI to measure the efficacy of the MDU technology, in particular the ambient levels.

A Bedfont G200 nitrous oxide detector was positioned in a delivery room about a metre away from the woman, the idea being that it would mimick the position the Midwife would be in when looking after a woman.

Monitoring was conducted within the birth centre and delivery suite, both before and after using the nitrous oxide MDU technology. Katy commented, “We saw significant reductions in our ambient levels of nitrous oxide which we feel translates to massive safety improvement for our Midwifery staff because the amount of nitrous oxide they’re exposed to has been significantly reduced. But it also demonstrates significant reduction in the amount of nitrous oxide we are contributing to the environment”.

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Discussing the findings further, Katy added, “What this means is we can continue to use nitrous oxide as an analgesic, provide a safer environment for our staff and know that we are helping the environment as well”.

Katy Whitehouse, Consultant Anaesthetist

Further Information

For further information on the services offered at the Royal Victoria Infirmary, please visit:
https://www.newcastle-hospitals.nhs.uk/services/maternity/

For further details on the MDU technology or to request a discovery session, please scan the QR code below.

Book a Discovery Session

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