

National Green Theatres Programme Action for Adoption

Reducing the Use of Ethyl Chloride Spray in Testing Sensory Level for Neuraxial and Regional Blocks

December 2023

About

This information raises awareness about this carbon-saving action. There is no formal requirement to report on this action through the National Green Theatres Programme, however Boards are encouraged to consider how they are adopting this action ensuring they are connected with any relevant initiatives or national work streams.

Background

This action relates specifically to assessing skin sensitivity to cold. There is no suggestion of a change in practice where testing is currently undertaken using light touch.

Neuraxial block and other regional anaesthesia techniques are checked for effectiveness before surgery by testing sensory and motor function. Testing for cold has traditionally been achieved using ice, however access to ice machines in theatres has more recently become restricted.

Ethyl Chloride is now commonly used instead as it can be stored at room temperature in theatres and has a rapidly cooling effect as it vaporises. Health Boards have the opportunity to replace Ethyl Chloride with alternatives which have a lower environmental impact.

Impact of Ethyl Chloride

Ethyl Chloride is a volatile gas stored in an aerosol can (which requires disposal) and takes 1 to 2 months to break down.

It is not thought to be a significant contributor to greenhouse gases as it has a short half-life. It is, however, acutely toxic to aquatic life, birds, plants and can cause frostbite and liver and kidney toxicity in humans. There is also a carbon footprint impact from manufacturing, transport and disposal.



CoolSticks

CoolSticks are an alternative option when testing for cold if ice is not available. These are metal rods that are cooled to apply cold. They can be stored in theatre fridges and are reusable.

CoolSticks are now being used by a number of NHS Scotland Boards and NHS England Trusts, meaning there is an emerging evidence base to support use as alternatives to Ethyl Chloride.



A trial completed in University Hospital Ayr, (NHS Ayrshire & Arran) demonstrated a 51% reduction in the use of Ethyl Chloride in the 6 months following CoolSticks being introduced.¹

Potential carbon and cost savings

It is difficult to collect robust data to calculate potential carbon savings, particularly for the manufacture and transport of Ethyl Chloride to the United Kingdom. The following calculations focus only on the composition of the ethyl chloride container and CoolSticks and are made using figures taken from the Inventory of Carbon Emissions².

Item	Material	Weight (kg)	Emission Factor (kgCO ₂ e/kg)	Emissions / Unit (kgCO ₂ e)*	Emissions / use (kgCO ₂ e)**
Ethyl Chloride Can	Tin Plated Steel	0.039	2.85	0.111	0.01
CoolStick	Stainless Steel	0.120	4.40	0.53	0.0002214
	Delrin (POM-H) Polyethylene (substituted for Polyoxymethylene)	0.01	2.54	0.03	
	Total			0.55	

*Emissions / unit = weight of item x Emission Factor Specific to Material

**Emissions / use = weight of item x Emission Factor Specific to Material / number of uses across lifespan
Lifespan of Ethyl Chloride can = 10 uses Lifespan of CoolStick = 2500 uses

Replacing Ethyl Chloride with alternatives which have a lower environmental impact has the potential to save:

	9.8kgCO₂e for every 1000 procedures undertaken.		£1, 776 for every 1000 procedures undertaken.***
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***Assuming approximate cost of Ethyl Chloride = £18 per can, approximate cost of CoolSticks = £60 each

Contact us

If you have any questions about this action, please contact the National Green Theatres Programme by emailing gjnh.cfsdgreentheatres@gjnh.scot.nhs.uk.

¹ The Use of Cool Sticks to Assess Level of Spinal Anaesthesia poster, Karen Belch and Joellene Mitchell, presented at Euroanaesthesia 2023 conference.

² ICE Database - https://circularecology.com/embodied-carbon-footprint-database.html#.XKX_oJhKhPY