

Reducing the use of Ethyl Chloride Spray in Obstetrics with a Cool New Idea: a Quality Improvement Project

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Introduction

Climate change is a public health emergency recognised by the NHS, with anaesthetic gases responsible for 5% of all NHS carbon emissions [1]. Specifically, Ethyl Chloride is a hazardous air pollutant that can remain in the atmosphere for over a month before degrading, in addition to being detrimental to aquatic life. Importantly, there are potential harmful effects to both staff and patients; if inhaled, Ethyl Chloride can cause a dose-related continuum of neurological effects, ranging from seizures to cardiopulmonary arrest.

To reduce the use of Ethyl Chloride spray, we have introduced reusable Cool Sticks (refrigerated plastic sticks with a metal tip) in our obstetrics department for testing sensory levels following neuraxial blocks [Figure 1].



Figure 1. Cool Stick

Methods

A baseline survey demonstrated that most obstetric anaesthetists at our trust were keen to trial a more sustainable device for testing sensory levels. Subsequently, the Cool Sticks were introduced in both of our obstetric theatres, in addition to the labour ward. The financial and environmental impact of using Cool Sticks compared with Ethyl Chloride spray was assessed. Following a trial of 6 months, feedback was collected from obstetric anaesthetists via a survey. The latter assessed ease of use of the sticks, any problems encountered, and whether Ethyl Chloride sprays should be replaced with Cool Sticks in the long term.

Results

As the Cool Sticks are reusable, we have calculated projected yearly savings of over £15,000 for our trust [Table 1]. Additionally, the projected total level of carbon emissions is significantly lower with the use of Cool Sticks [Table 1]. The results of the staff feedback survey are summarised in Figure 2. The overall feedback we received for this sustainable initiative was excellent, with several of the comments shown in Figure 3.

	Cost per unit (£)	Total cost (£)	Production (kgCO ₂)	Transportation (kgCO ₂)
Ethyl Chloride	18	987 x 18 = £17,766	17,531	20
Cool Stick	60	40 x 60 = £2,400	3	0.15

*Financial and environmental impact of disposal of Ethyl Chloride sprays not included, hence difference likely to be even greater.

Please note costs and carbon emission levels shown are yearly for Ethyl Chloride and one-off for Cool Sticks.

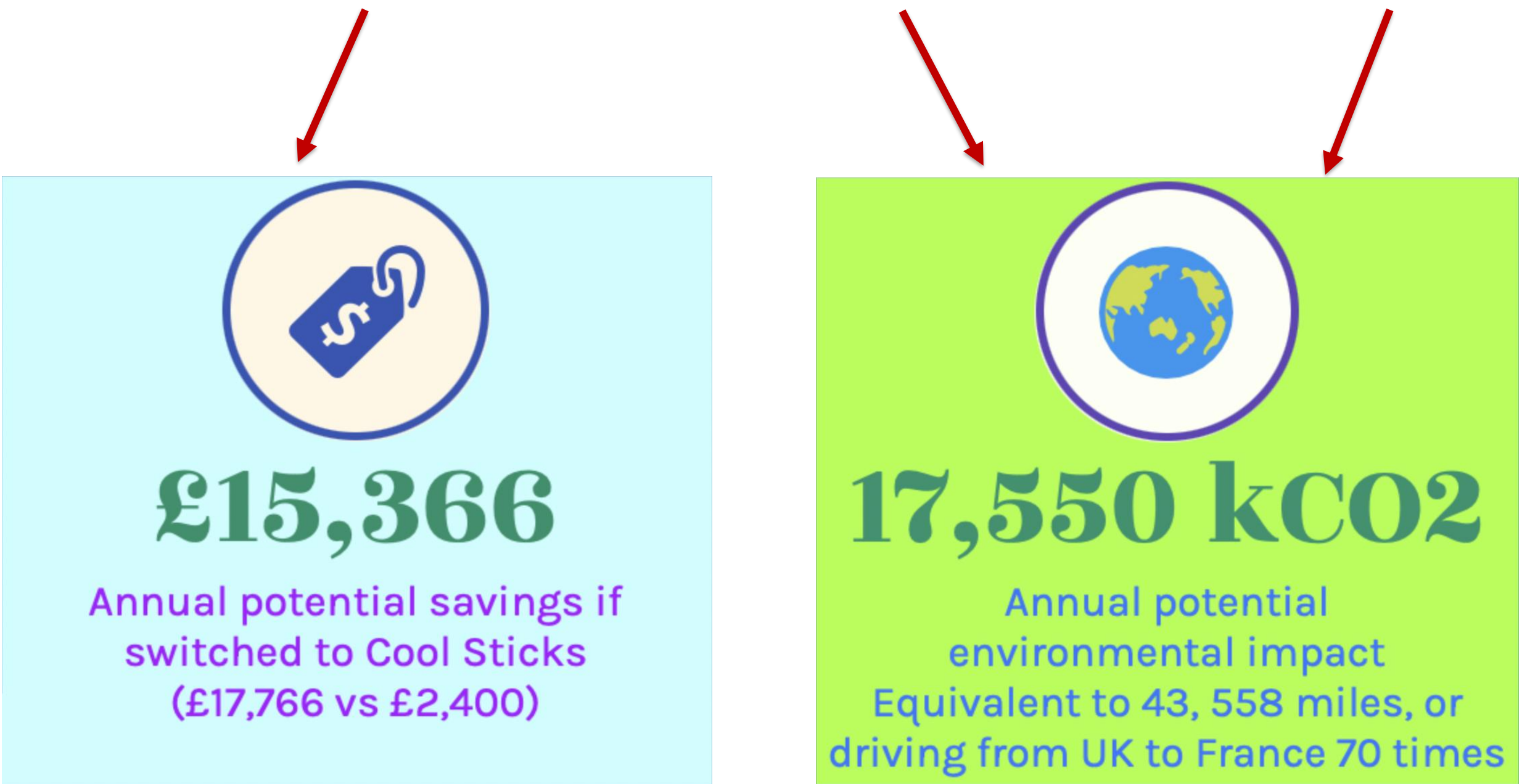


Table 1. Projected financial and environmental impact on switching from Ethyl Chloride spray to Cool Sticks*

Discussion

In the face of our current climate crisis, there is clearly a need to implement environmentally sustainable initiatives within the NHS [2]. We have demonstrated that Cool Sticks are a feasible alternative to Ethyl Chloride spray for assessing sensory levels after neuraxial blocks, and can lead to a significant positive financial and environmental impact. Our current aim is to lead a trust-wide initiative and introduce the use of Cool Sticks in other clinical areas such as general theatres, high dependency units, and enhanced care units. By trialling sustainable practices such as Cool Sticks, the NHS can aim to be a step closer to achieving net zero by 2040.

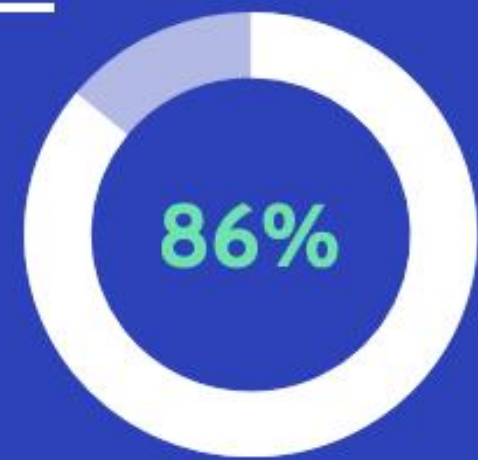
References

- Charlesworth M and Swinton F. Anaesthetic gases, climate change, and sustainable practice. *Lancet Planet. Health* 2017;1(6):e216-7.
- Tennison I, Roschnik S, Ashby B, et al. Health care's response to climate change: a carbon footprint assessment of the NHS in England. *Lancet Planet. Health* 2021;5(2):e84-92.

Staff Survey



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Responses



Found Cool Sticks
easy to use



Obtained a
reliable
dermatome for
cold



Would be happy
to use Cool
Sticks instead of
Ethyl Chloride

Figure 2. Results of staff survey on the use of Cool Sticks

Comments



Excellent feedback

- Excellent Initiative
- More pleasant for patients...less likely to jump
- Better than Ethyl Chloride...less confusion with patients



Things to consider

- Cool Sticks can warm up between cases
- Can be difficult to differentiate between cold and touch
- Limited location of Cool Sticks at present

Figure 3. Selected comments from staff regarding the use of Cool Sticks