

No more single-use wraps waste thanks to the Sterimelt machine

Natalie Roddis, Waste and Sustainability Officer at Burton Hospitals NHS Foundation Trust, is in the final year of an MSc Wastes Management degree and is currently undertaking training on the Climate Reality Leadership Corps Programme. She talks about the innovative technology that has been installed at Burton Hospitals, which combines her background in waste management and passion for climate change action in the NHS.

THE ISSUE

Over four million operations are performed across the NHS in England each yearⁱ and reusable surgical instruments are used for many of these procedures. Such instruments must be processed and sterilised before use, as an effective sterile barrier system is imperative in maintaining the integrity of the instruments.

Many hospitals and Sterile Services Departments choose to use single-use wraps as the sterile barrier, which presents waste disposal implications. An alternative option to single-use wraps are containers or reusable fabrics. For Burton Hospitals NHS Foundation trust, aside from a large initial financial outlay, containers would present storage concerns and costs for ongoing maintenance and checks. Reusable wraps were also not desirable for our trust, due to their inferior performance as a bacterial barrier (following repeated laundering) which would present increased risk of microbial penetration^{ii,iii,iv}. In addition to barrier integrity concerns, reusable wraps also present environmental implications. Approximately 4.5 times more resources are consumed in the reusable wrap lifecycle compared to single-use wraps, partly due to water and chemicals used in laundering^v. Whilst single-use wraps are deemed the best option for our trust - logistically, financially and environmentally - their use does generate approximately 16 tonnes of waste per annum.

PROJECT BACKGROUND

The Sterile Barrier Association^{vi} advocates the use of recovery and recycling for used sterile barrier materials where there is no risk of contamination. Despite this, within Burton Hospitals- and undoubtedly many trusts across the UK- polypropylene tray wraps have historically been classified as infectious clinical waste even where there was no evidence of contamination with blood or bodily fluids. Consequently, this waste was disposed of via Alternative Treatment - which is classed as 'recovery' within the waste hierarchy. Whilst this is preferred to 'disposal' methods (such as incineration without energy recovery) it presents concerns, as the valuable raw materials (such as oil) used to make the polypropylene tray wraps are still destroyed after only one use.

The trust became aware of Sterimelt technology in 2017, following Thermal Compaction Group's (TCG) successful trial of the machine in Wales. The innovative concept was of immediate interest to the Head of Facilities, the Decontamination Lead and myself due to the environmental benefits that the machine could deliver. After seeing Sterimelt in use in Wales, and after weighing up the cost of the machine versus the clear benefits, a paper was presented to our Board – who approved the outright purchase of a Sterimelt machine. The machine was installed on 21 March 2018 and currently runs under EA RPS 112, meaning that a permit for heat treatment of plastics for reuse is not currently required by our trust.

THE MACHINE

Sterimelt thermal compaction technology, developed in the UK, presents a sustainable solution for the disposal of used polypropylene tray wraps. Sterimelt machines heat densify polypropylene wraps at approximately 320°C to create inert, sterilised, briquettes which can be sold for reintroduction into the supply chain - reducing the consumption of raw materials within the production of new products (such as garden furniture, fences and office products). This presents a sustainable method of handling waste, enabling recycling, opposed to treatment by recovery or incineration.

Despite the machine being installed at our trust for only a short period, the technology has been thoroughly embraced, and is subsequently operating well. The trust expects to observe savings of around £300 per month through waste avoidance. Revenue for the briquettes will also be achieved, once we begin to sell these for reintroduction into the supply chain.

I was pleasantly surprised that there was minimal resistance to change at the trust following installation of the machine. The Sterile Services team – who were required to change their working procedures following installation – have been imperative in the smooth running of the machine; by ensuring that only uncontaminated wraps are segregated for processing. Mark, our current operator of Sterimelt, is doing a fantastic job in maintaining the efficiency of the machine – which is incredibly easy to use and Thermal Compaction Group (TCG) is also always on hand to provide advice and expert knowledge.

LOOKING FORWARD

Luckily for us, Sterimelt was installed only a few months after Sir David Attenborough and Blue Planet II raised public awareness of the impacts of climate change and single-use plastics. This has helped to start a conversation within the trust about recycling and sustainability, and the installation of Sterimelt has further promoted engagement with staff and the public, through social and local news media communications. I hope that the Blue Planet legacy is long lasting and wide reaching, and that the public drive to make changes to battle the climate crisis continues in order for us to see real changes in the near future. In the meantime, Sterimelt is an exciting innovation and presents a real opportunity for healthcare providers to contribute to the circular economy. TCG, the innovators behind the machine, understand the importance of moving away from the linear model of consumption and are constantly striving for new opportunities. I am aware that other innovations and technologies are on the horizon from TCG – presenting exciting opportunities for organisations to make a real difference.

ⁱ Royal College of Surgeons. (n.d). Surgery and the NHS in numbers. RCS (online). Available from: <https://www.rcseng.ac.uk/news-and-events/media-centre/media-background-briefings-and-statistics/surgery-and-the-nhs-in-numbers/> [Accessed 24 May 2018].

ⁱⁱ World Health Organisation. (2016) Decontamination and Reprocessing of Medical Devices for Health-care Facilities. WHO(online). Available from: <https://wfhss.com/wp-content/uploads/WHO-decontamination.pdf> [Accessed 24 May 2018].

ⁱⁱⁱ INDA (2011) in Hart, J. (2012) Not As 'Green' As It Seems: Reusable Sterilization Wrap. *Canadian Green Health Care Digest*.

^{iv} Nichols, R and Smith, J. (1991) Barrier efficacy of surgical gowns. *Archives of Surgery*. 26, pp. 756-761.

^v Mcilvaine Company (2009) in Hart, J. (2012) Not As 'Green' As It Seems: Reusable Sterilization Wrap. *Canadian Green Health Care Digest*.

^{vi} Sterile Barrier Association. (2012) Position Paper – Packaging and Packaging Waste Directive (94/62/EC) 1994 amended by Directive 2004/12/EC – Essential Requirements. SBA (online). Available from: <http://www.sterilebarrier.org/media/40306/Position-Paper-Packaging-Waste-Essential-Requirements-Rev3-revised-April-2012.pdf> [Accessed 24 May 2018].