Heathcare Improvement Project on Sustainability within Operating Theatres



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Rationale and Objectives



Within our Healthcare Improvement Project (HIMP) we are hoping to try implement further recycling within theatres. This will hopefully save the trust money due to less waste needing to be incinerated as well as reduce carbon within the trust.



Case studies from Oxford University Trust showed a cost saving of £1319.38 per year, and a saving of 8,886 kg CO2e per year by implementing recycling within their theatres.

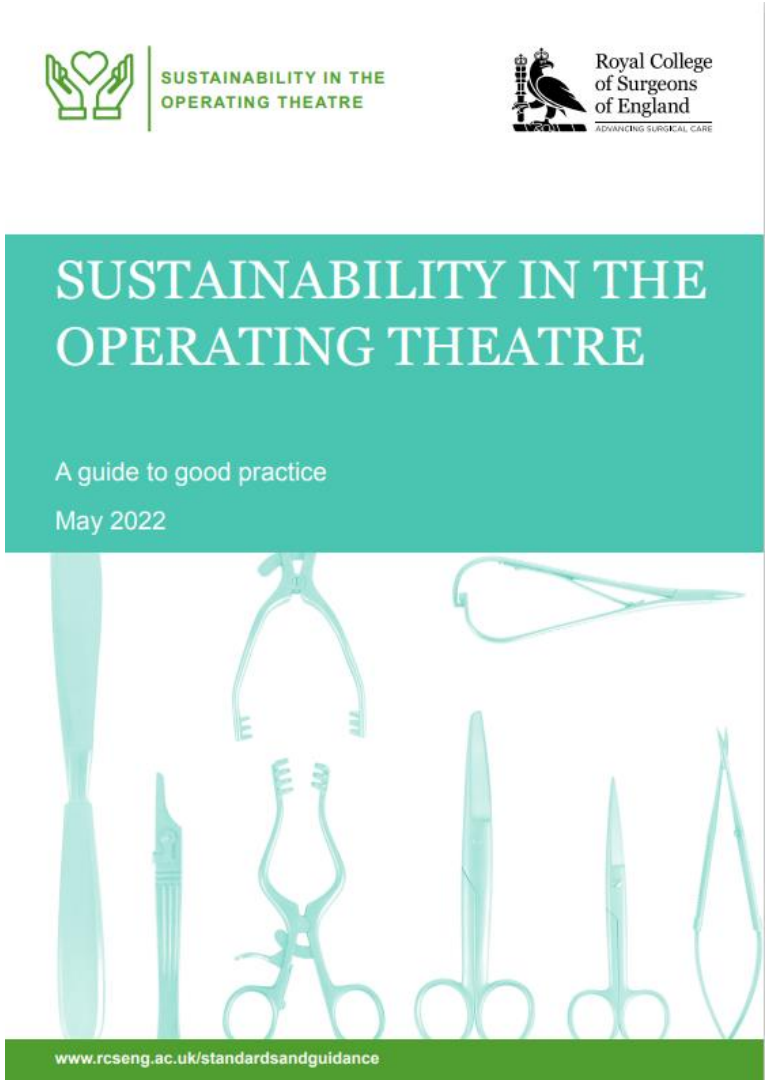


Objectives:

- Observational study looking at how much recyclable materials are put into non-recycling bins within theatres.
- Tally the different recyclable materials into paper, plastics, metals
- Snapshot of waste within a 24 hour period
- Calculate how much CO2 we would reduce and how much money could be saved

Royal College of Surgeons in England

- The NHS has pledged to meet a net zero carbon target by 2045 through its Greener NHS campaign, and individual surgeons and surgical teams are in a unique position to lead efforts to improve the environmental sustainability of the operating theatre.
- There is also a general consensus that up to 80% of all theatre waste is generated before the patient arrives for surgery and therefore, is not infectious unless it is mixed with other waste.



Data Collection

- We completed a 24-hour audit of recyclable waste produced in CEPOD operating theatre
- This involved documenting the number of items thrown into general waste bins in the following categories:
  - Paper/cardboard
  - Hard plastic
  - Soft plastic
  - Fabric
  - Metal
- The general waste bins included one bin in the surgical scrub area and another in the preparation area.
- These bins were also weighed at the start and end of each case

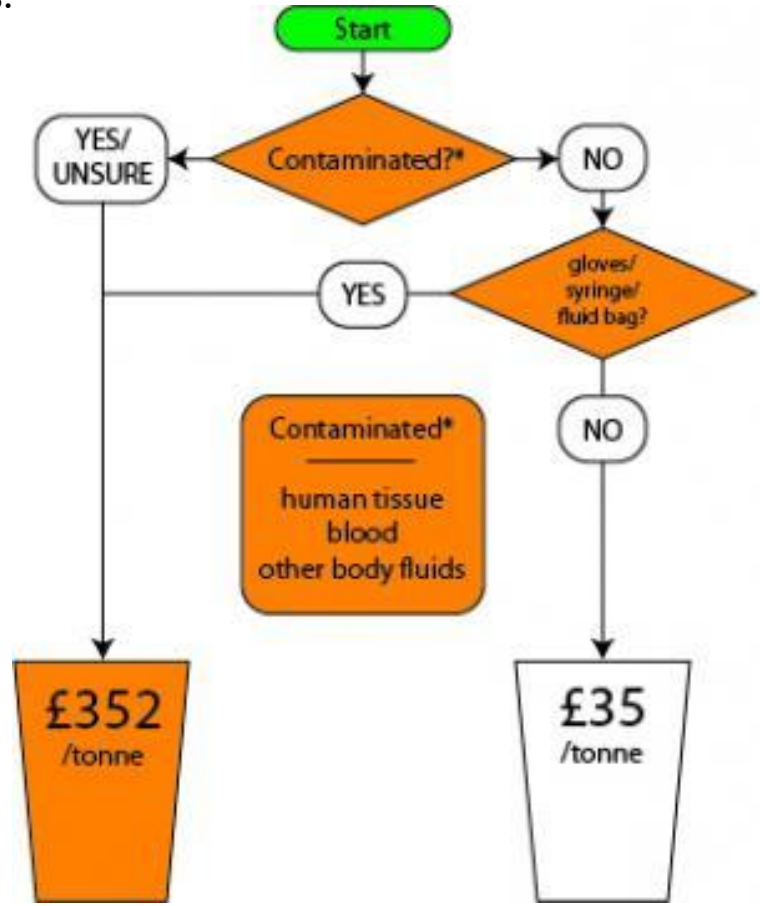


Table 3. Common operating room (OR) plastics (McGain et al. 2008, 2015).

Type of plastic	Resin Identification Code	Examples in OR	Recyclable
Polypropylene	5 PP	• "Paper-looking" surgical instrument wraps • Disposable forced air-warming blankets	Yes
Polyethylene	1 PETE	• Half-paper/half-plastic instrument wraps • Saline and water ampoules • Intravenous (IV) fluid bags and warming blanket wraps	Yes
Polyvinylchloride	3 V	• Oxygen masks • Oxygen tubing • IV fluid bags and giving sets • Suction tubing	Yes
Copolymers (polypropylene/ polyethylene)	5 PP	• Syringes • IV cannula covers • Yankauer suckers	No
Polyurethane		• Anaesthetic trays	No

Results

Results were collected on 29th April. 4 cases were analysed over a 24-hour period at the CEPOD theatre.

Number of operations	4
Hours of operating time	5 hours and 6 minutes
Total amount of waste	24.31kg
Total amount of waste that could be recycled	22.51kg
Cost of black bin waste per bag	£8.15
Potential cost if recycled per bag	£0.85
Potential savings	£7.60

Results

Results were collected on 29th April. There were only 4 cases that day so this data has been extrapolated, assuming an average of 4 cases per day for the year in each operating theatre (main theatres and day surgery).

Estimated hours of operating time per year across all operating theatres	29,702 hours and 24 minutes
Total amount of waste per year	141,545.088kg
Total number of recycled items estimated per year	3,276
Percentage recycled	9.48%
Potential savings if all recycled	£4717.88
Total amount of CO2 per kg saved	30,794.40

What does this mean for SDH?



Packing waste used in a single thyroidectomy operation (Lee et al. 2024)[1]

- There is scope for improvement!
  - Save cost
  - Reduce carbon footprint
- Surgical theatres are an appropriate site for primary intervention
  - Operating theatres account for over 50% of **ALL** hospital waste generated[2]
- Education and active efforts are needed amongst staff
- A tangible way to achieve SDH's Green Plan Priorities:

> **13.** Increase Resource Productivity – Extend the life of items purchased (repair), increase the volume of recycled waste and repurpose items (e.g. furniture).
>
> **14.** Reduce the volumes of residual waste through supplier engagement (avoidance), reuse and recycling.

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What's next?



INFOGRAPHIC TO BE PUT IN THEATRES



EDUCATION ON WHAT CAN AND CAN'T BE RECYCLED



DISCUSSION WITH THE WASTE MANAGEMENT TEAM OVER RECYCLING BINS IN THEATRES



REAUDIT POST EDUCATION AND INFOGRAPHIC TO SEE IF THERE IS AN IMPROVEMENT

Any Questions?

Citations

1. Lee, Y. *et al.* (2024) ‘Healing patient, harming planet? A drive towards sustainable surgery: Review of waste production and recyclability of surgical instrument packaging’, *The Annals of The Royal College of Surgeons of England* [Preprint]. doi:10.1308/rcsann.2023.0045.
2. Guetter, C.R. *et al.* (2018) ‘Greening the Operating Room’, *The American Journal of Surgery*, 216(4), pp. 683–688. doi:10.1016/j.amjsurg.2018.07.021.
3. Salisbury NHS Foundation Trust. 'Our Green Plan 2021-2024', *https://www.salisbury.nhs.uk/about-us/sustainability/*