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Towards Greener Hand Surgery - An Audit Of Current Practices In A Tertiary Hospital

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Background:

In recent years, there has been a growing trend in operating theatres towards the use of single-use products, many of which are not recycled due to concerns regarding cross-infection, convenience, and cost. Hand surgery ranks among the most common surgical procedures performed within the NHS and is associated with a significant carbon footprint (1).

Methods:

A spot audit was conducted to assess current practices and determine the carbon footprint associated with disposable materials and instrumentation utilized during a typical day in the Hand Surgery main theatre and procedure room at Queen Elizabeth Hospital Birmingham (QEHB). Analysis of weekly operation theatre activity indicated that procedures were of standard duration and complexity, thus facilitating extrapolation of data from a one-day audit to estimate annual emissions.

Results:

Utilizing the United Kingdom Government Greenhouse Gas Conversion Factors for Company Reporting, it was estimated that the use of closed-loop source materials for production resulted in reduced carbon dioxide (CO_2) emissions compared to raw materials. Specifically, in the main theatre, the annual CO_2 emissions from raw materials amounted to 8355kg, whereas closed-loop source materials yielded 6224kg. Similarly, in the procedure room, extrapolated annual CO_2 emissions were 1525kg and 859kg for raw and closed-loop source materials, respectively. On average, 3.4 operations occur per day in a procedure room at QEHB.

Conclusion:

The adoption of closed-loop source materials over raw materials has the potential to save 2130kg of CO_2 emissions per year in each main theatre and 666kg in each procedure room for hand surgery. The use of single-use products should be evaluated against clinical evidence, with preference given to those supported by robust data. Additionally, the utilization of individually packaged plates and screws warrants scrutiny regarding their associated risks and benefits. Existing literature suggests that disposable tourniquets, bipolar cautery leads, packing, and surgical pre-sticks contribute significantly to non-recyclable waste volumes and may be candidates for reuse or recycling (2).

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Table 1: Summary equipment list

Equipment for each operation in a procedure room	Number
Disposable instrument tray	1
Size 7 glove set	2
800ml Kidney dish S/W	2
Single use jeweller bipolar forcep, 115mm, 0.5mm non-stick tip, integral 3m cable, fly leads	1
Tourniquet Dispo Cuff (46cm/18in)	1
Tourniquet barrier	1
10 ml syringe	2
ChloraPrep with Tint (10.5ml)	2

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