

Surgical tray rationalisation in laparoscopic cholecystectomy

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Background & Context

- For surgical setups using reusable surgical instruments, **decontamination accounts for approximately 85% of item life cycle emissions**³
- Use-audits are rarely conducted, resulting in **excess reprocessing of up to 75% of items** that are left unused⁴

Identifying the Opportunity

- LTHT conduct over **800 laparoscopic cholecystectomies** a year across four sub-specialties. Each specialty setup is different & contains **>100 instruments** spread across multiple trays
- Reducing an instrument set by a single standard DIN basket could annually save **>1 tCO₂e locally** or **100 tCO₂e nationally**. Scaled to all laparoscopic procedures this could save over **2kT CO₂e**

Surgical teams

Theatre leadership team

Sterilisation service or supplier

Theatre teams

Procurement & sustainability teams

Fig 2. Key stakeholders

Methodology

The Audit

- Instrument checklists were developed for each core speciality & completed per procedure to capture instrument use rates
- Data collection (January-March 2023), was completed across 70 cholecystectomy cases
- Qualitative data was collected from surgeons and scrub practitioners on the opportunities or difficulties associated with set streamlining

The 'Hackathon'

- A 'Hackathon' event enabled discussion to curate & confirm the new streamlined setup, featuring representatives from all speciality teams
- Use-data presented in a heatmap enabled triaging of the discussion on instrument inclusion / exclusion
- Reduction opportunities were prioritised by instruments that could be consolidated into fewer & / or smaller trays to maximize savings

Results

Environmental & Cost Savings

- The final consolidated set consisted of **65 items**, in **one dual-layered reusable container**
- The streamlined set is projected to save **2-3 tCO₂e**⁶ and **£16-22k**⁷ in sterilisation costs annually. Scaled nationally, this could yield over **300 tCO₂e** and **£1.5m** in savings

Qualitative findings

- Surgical teams were overwhelmingly positive about the exercise, 96% of respondents reporting additional perceived benefits in **time saved** counting unused instruments



Fig 3. The 'Hackathon': reviewing the instrument usage heatmap

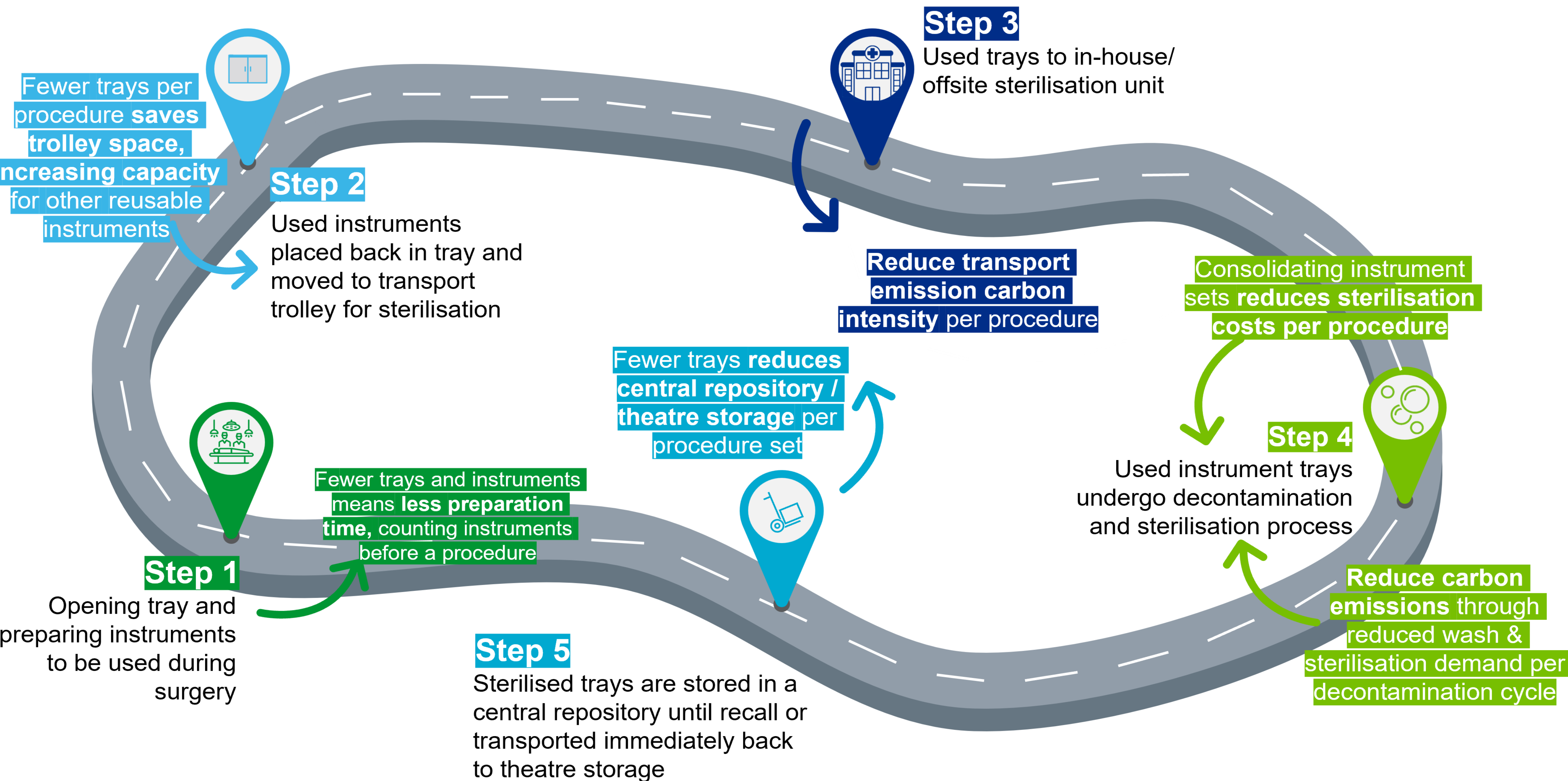


Fig 1. Savings in the decontamination lifecycle

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