Sustainability in the Operating Room: Results of a Single-Use Device Recycling Program Initiative

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Introduction

At the global level, the climate footprint of the health sector represents 4.6% of net global emissions, or the equivalent of 2 gigatons of Carbon Dioxide (CO2). If the health care sector were a country, it would be 5th largest contributor in the world. The operating room alone accounts for 30% of these emissions. The three main components of this carbon footprint are: waste production, energy demand, and anesthetic gas emissions.

Program Design & Methods

Partnering with Resourcify, J&J pilot tested our recycling program for single-use devices (SUD) in Germany and Switzerland in 2019. Building on the success of the pilot program, recycling programs have been implemented in hospitals throughout Europe. The details of the process vary by country, but the steps to implementing the program are as follows:

- Check local legal regulations
- Find partners (logistics, recyclers, cleaning facility)
- Budget preparation
- Organize bins for collection of devices
- Train all participants in the process



Figure 1. Example of recycling process

Program Design & Methods cont'd

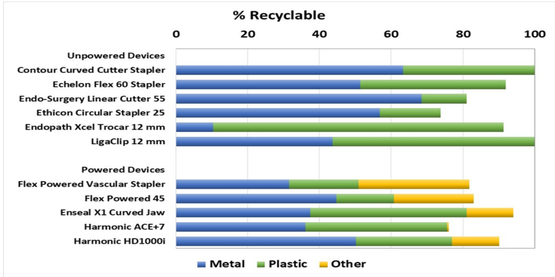


Figure 2. Examples of products that have been evaluated for the recycling programs, all a minimum of 75% recyclable.

Products eligible for recycling are disinfected and collected by OR staff in reusable, water-resistant bins, and stored for transport to a cleaning facility, where they are deep cleaned based on local regulations. The products are then collected by the recycler, processed, and raw materials are sold to market. Hospitals are provided a dashboard including an app that can be used to create and review orders for pickup and view the monthly environmental impact for that hospital.

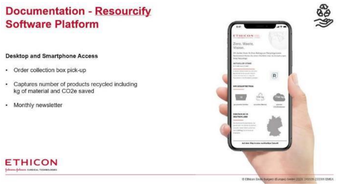


Figure 3. Example of hospital app

Program Design & Methods cont'd

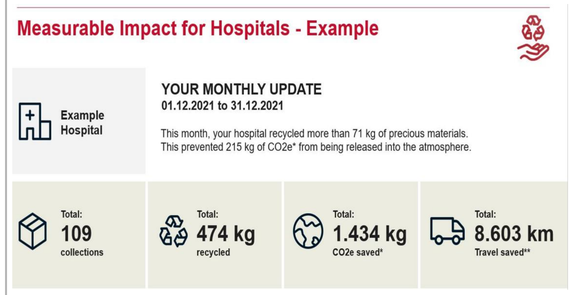


Figure 4. Example of hospital dashboard

As of December 2023, since the implementation of this program, the environmental impact:

- Total impact: >24,000kg diverted from incineration, 11,700kg of metal & 10,500kg of plastic recycled → **100,000kg CO2e savings**
- SUD impact: 78K devices collected, **22,400kg** diverted from incineration, 10,600kg metal & 10,400kg plastic recycled
- Aluminum foil impact: >790K foils collected, **1,100kg** metal recycled
- DPS Tube impact: 71kg tubes diverted from incineration, **70kg** of plastic recycled
- Electrophysiology catheter impact: **143kg** of catheters collected; 86kg of plastic recycled, 31kg metal recycled

The calculated CO2e savings amount is **100,000kg**, which is equivalent to offsetting the environmental impact of a midsize car traveling **602,612 km (374,446 miles)** – this is more than **15 times around the earth**.

Conclusions

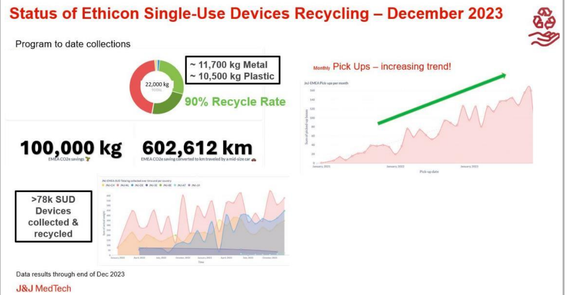


Figure 5. Example of J&J dashboard as of the end of December 2023

Hospital operating facilities are a major source of waste production because of the high-output nature of resource-intensive procedures. The Single-Use Recycling initiative can substantially reduce our ecological footprint by diverting waste from landfills. We hope to capitalize on the program's success by expanding recycling opportunities in the OR throughout EMEA and the US.

