COMMENTARY

The Case for Hospitals to Boost Single-Use Device Reprocessing Programs

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Introduction

The health care sector contributes significantly to the climate crisis, accounting for 8.5 percent of US emissions and 4.4 percent globally (Karliner et al., 2019; Eckelman et al., 2020). In line with global goals, many hospitals and health systems have committed to reduce greenhouse gas (GHG) emissions by 50 percent by 2030 and achieve net-zero emissions by 2050 (Health Care Without Harm, 2025). Activities beyond a hospital's direct control, known as Scope 3 emissions, account for most (82 percent) of health care emissions. Up- and downstream activities, such as waste disposal, employee commutes, business travel, investments, and purchased goods and services, generate these emissions. Of Scope 3 emissions, purchased goods and services, often referred to as the supply chain, typically produce the largest share. Because the health system does not oversee their manufacture, supply chain products are notoriously difficult to measure and manage (Eckelman et al., 2020).

Single-use medical and surgical devices (SUDs) are a significant driver of supply chain emissions, especially in operating rooms (Robinson et al., 2023). Operating rooms consume up to six times more energy per square foot than other hospital areas and generate over 50 percent of a facility's waste, making them a key target for emissions reduction (MacNeill et al., 2017). However, identifying and replacing high-emission products with lower-emission alternatives remains a challenge due to limited data.

Immediately Available Solutions to Reduce Supply Chain Emissions, Strengthen Supply Chain, Lower Costs

Reprocessed single-use devices (rSUDs) offer a viable solution. The Association of Medical Device Reprocessors (AMDR) defines regulated reprocessing as the FDA-supervised cleaning, testing, and repackaging of SUDs for reuse by hospitals and clinics (AMDR, 2025). Since 1998, FDA regulation and studies, including an independent Government Accountability Office (GAO) analysis, have found no increased patient safety risk from reprocessing (GAO, 2008).

In 2024, AMDR members helped US hospitals save over $398 million and avoid 113 million pounds of CO2 equivalent emissions—comparable to eliminating 5.79 million gallons of gasoline—by using rSUDs instead of virgin devices. Despite this, only a fraction of reprocessable devices are being used.

A growing body of peer-reviewed research supports reprocessing as a strategy to reduce costs, decrease solid waste, and improve supply chain resilience (Kwakye et al., 2010; Rizan et al., 2023). Reprocessing can lead to significant financial savings by reducing procurement and disposal costs (MacNeill et al., 2020). The threat of tariffs imposed on medical devices, many of which are

originally manufactured outside the United States, potentially further underscores the importance of access to lower-cost, lower-emitting rSUDs.

Sharper Focus on GHG Emissions from Health Systems

Recent peer-reviewed life cycle assessments (LCAs) have evaluated emissions from rSUDs versus virgin devices, finding a 40–60 percent reduction in GHG emissions for rSUDs (see Table 1). AMDR used these LCA data to create an emissions calculator, estimating kgCO2e savings across operating rooms, general patient care, and cardiovascular procedures. On average, the studies show a 44 percent reduction in kgCO2e when using reprocessed devices compared to their virgin counterparts.

Organizations like AMDR and Practice Greenhealth provide resources and support to hospitals with their rSUDs programs, emphasizing that engagement and commitment are critical to success.

The United Kingdom's National Health Service (NHS) exemplifies a strong commitment to reprocessing (though referred to as "remanufacturing"), recently launching a "major crackdown on waste." (NHS, 2024). This initiative aims to reduce millions of pounds of medical waste annually while reallocating resources to frontline care. Central to this effort is the Design for Life roadmap, which seeks to reduce reliance on SUDs, foster a circular economy, and decrease dependence on foreign imports.

By aligning environmental and economic benefits, reprocessing dispels the misconception that sustainable options are inherently costlier.

Barriers to Adopting Sustainable Health Care Practices

One barrier to rSUD adoption is the perception of reduced patient safety, which is easily dispelled. More than twenty five years of research and regulatory scrutiny by the FDA have revealed no increased risk to patient safety as a result of reprocessing (GAO, 2008).

One of the biggest challenges in the rSUD market is interference and anti-reprocessing behaviors on

TABLE 1 | Summary of Recent Environmental Life Cycle Assessment (LCA) Studies of Reprocessed Single Use Devices (rSUDs).

Device and Study Used	Percent Reduction in GHGs with the Reprocessed Device
Electrophysiological Diagnostic Catheter (Schulte et al., 2021)	50%
Electrophysiology Catheter (Meister et al., 2023)	60%
Intracardiac Ultrasound Catheter (Stryker's Sustainable Solutions, 2023)	49%
Ultrasonic Shears (Stryker's Sustainable Solutions, 2023)	46%
Bipolar Electrosurgical Instrument (Stryker's Sustainable Solutions, 2023)	33%
MyoSure REACH (Stryker's Sustainable Solutions, 2023)	23%
Pulse Oximeter (Stryker's Sustainable Solutions, 2023)	53%
Intermittent Pneumatic Compression Sleeve (Lichtnegger et al., 2023)	40%

SOURCE: Created by authors, based on recent peer-reviewed LCAs evaluating emissions from rSUDs versus virgin devices.

the part of some original equipment manufacturers (OEMs). To some OEMs, a dollar saved by a hospital reprocessing is one lost to the OEM's revenue. SUDs are big business—OEMs do not want to lose sales on account of device reprocessing, and often deploy tactics aimed at preventing it.

Health care stakeholders have described a variety of tactics, such as:

- "Chipping" the virgin device to render it inoperable upon reprocessing.
- Updating software to disable rSUDs on hospital equipment without permission or misleading staff about the updates' impact.
- Designing devices with features like non-reprocessable coatings and other hardware.
- Including clauses in contracts that prohibit hospitals from purchasing rSUDs (Hennein et al., 2022).
- Threatening to void warranties or withdraw case support if rSUDs are used.
- Price gouging by significantly increasing prices for reprocessable devices to push hospitals toward non-reprocessable alternatives.
- Interfering with hospital assets by replacing cables, moving or hiding rSUDs.
- Tampering with reprocessing collection bins and instructing physicians or nurses to destroy devices (hospital property) to prevent reprocessing.

Such practices not only contribute to waste and environmental harm but also limit health systems' ability to establish sustainable procurement strategies.

Last year, the U.S. government began to take action. Agencies including the Department of Justice, Federal Trade Commission, and HHS launched a portal to anonymously report anticompetitive practices (US Department of Justice, 2025). Health care leaders can also combat these behaviors by adopting procurement policies explicitly favoring sustainability and reprocessing.

Steps Forward

Regulated reprocessing of SUDs is an easily implementable, immediate and effective sustainability strategy. The following actions can address current barriers:

1. **Education:** Continue educating health care staff and stakeholders on the safety, efficacy, and environmental benefits of rSUDs, supported by further LCAs and research.
2. **Investigation:** Federal agencies should expand investigations into wasteful, anti-competitive practices by some OEMs. Anyone in health care who has witnessed any of these practices should report them to the government using their porta (US Department of Justice, 2025).
3. **Proactive Procurement:** Health care leaders should adopt sustainability-focused procurement policies, mirroring commitments by the NHS and the US Department of Health and Human Services (HHS). The US government should lead by example and prioritize SUD reprocessing, and other regulated low-hanging fruit Scope 3 emission reduction strategies, at all federally run health systems, including the Veterans Health Administration. "Every federal health system has announced joint work to pursue emissions reductions associated with clinical care, such as those from anesthetic gases, certain types of inhalers, and medical device waste produced in health care processes" (Health Care Without Harm, 2025). The Veterans Health Administration and federal facilities have made the commitment but will need to explore all avenues to meet commitments.
4. **Incentives:** Government agencies should offer incentives and preferential treatment for sustainable practices, particularly those that reduce costs, and build supply chain resilience.

Conclusion

The health care sector must address its outsized role in climate change, one of humanity's greatest health threats (Romanello et al., 2024). Proven solutions like SUD reprocessing provide significant environmental benefits alongside cost savings.

To achieve meaningful emissions reductions, health and sustainability policymakers must advance the adoption of reprocessing through supportive policies and procurement strategies. The dual benefit of cost and carbon savings makes reprocessing an immediate and indispensable tool in the fight against climate change.

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regulated, commercial single-use device reprocessing companies.

Conflict-of-Interest Disclosures

Dr. Thiel owns Clinically Sustainable Consulting LLC and, through this business, has been a paid consultant for the Association for Medical Device Reprocessors (AMDR), Philips, Becton Dickinson (BD), Veterans Education and Research Association of Northern New England, Inc. (VERANNE), EarthShift Global, Stryker Corporation, CUE Health, Anthesis, Zasti Inc., Sustainable Solutions Corporation, Apiject, Kimberly-Clark Corporation, Sphera, the Institute for Healthcare Improvement (IHI), NYU Stern School of Business, Columbia University's SHARP program, and the University of California San Francisco. She has received honorariums and travel reimbursements for lectures and training given to 3M, Stryker, Vizient, Columbia University, and the University of Colorado. She has been a paid advisor to The Sean N. Parker Center for Allergy and Asthma Research at Stanford University, an unpaid member of the Mass General Center for Climate and Health advisory board, and a member of the advisory board for Zabble, Inc. for which she received stock options. **Dr. Collins** has no disclosures. **Dan Vukelich** is President and CEO of the Association of Medical Device Reprocessors.

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