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Incentivizing environmental sustainability for surgical healthcare at a systems level

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Abstract
The healthcare sector contributes up to 4.6% of global greenhouse gas emissions. The surgical system contributes predominantly. Despite this, many hospitals have been slow to adopt sustainable practices. This editorial discusses strategies to incentivize surgical healthcare systems to prioritize more sustainable operations, using examples from other industries as well as healthcare systems from more sustainable nations.

Keywords Surgery, Environment, Sustainability, Healthcare, Operations, Equity, Global surgery

Climate change is a major threat to public health worldwide. In recent years, there has been increasing recognition of the environmental burden associated with healthcare. Globally, health systems are responsible for 4.4–4.6% of greenhouse gas emissions, with the United States (US) being the greatest contributor [1]. While other industries have made steps toward carbon neutrality, the healthcare sector has remained resistant to change. Surgical healthcare, due to its continuous operations, substantial energy use, and significant waste production, represents an area where adopting sustainable practices can yield a profound impact. Operating rooms (ORs) consume 3 to 6 times more energy per square foot than other parts of hospitals and produce 20–30% of a hospital's waste [2]. Here, we discuss various strategies to incentivize surgical health systems to "go green," supported by other examples from the healthcare industry and beyond.

Federal incentives

Several governments across the world have developed programs that offer tax incentives and federal support for healthcare systems that invest in sustainable changes. The healthcare system in the United Kingdom (UK) was the first to commit to achieving net-zero carbon emissions in 2021 and the first major economy to halve emissions in 2022 [3]. The UK Government Department for Business, Energy & Industrial Strategy launched the Public Section Decarbonization Scheme in 2020 that provides grants to public sector healthcare providers for projects that improve energy efficiency and reduce carbon emissions. Since its inception, over 1,000 projects have received funding to upgrade their facilities, which includes renovations of operating theaters and surgical wards. In 2023 The UK Health Alliance on Climate Change produced the landmark Green Surgery Report that outlines how to reduce the environmental impact of surgical care while maintaining high quality patient care and potentially also saving the NHS money [4]. In 2021 the Royal College of Surgeons England launched the Green Surgery Challenge

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where 5 teams led surgical waste reduction projects that had combined projected annual savings of 133.4 tons CO_2e [5].

Other developed nations, including the US, have lagged behind. While federal initiatives and support programs exist, they have not resulted in the same decarbonization progress within the healthcare sector. This variance may be explained by fundamental differences in the healthcare and political landscapes of different countries. In the US, the healthcare system is privatized to a large degree, and private insurance companies and health networks may prioritize an agenda that revolves around profitability more than sustainability. This is in contrast to nations where healthcare is almost exclusively funded and managed by the government through taxation. Additionally, political strategies differ across individual states in the US, which may make it more difficult for hospitals to take advantage of the federal incentives that exist. In fact, only 15% of hospitals across the US opted to participate in the Health Sector Climate Pledge launched by the presidential administration in 2022 [6].

Sustainability accreditations and consumer perception

Accreditation agencies exist to hold the healthcare industry to high standards of hospital care and infrastructure quality. While they serve as an indicator of healthcare quality, accreditations from these agencies also appear to be good for the bottom-line, as hospital systems boast accreditations and awards in marketing campaigns. Leveraging this proven model, another strategy to incentivize environmentalist change within the surgical healthcare industry is to utilize and publicize an accreditation for hospital sustainability. The Joint Commission, the US' largest and oldest standards-setting body, recently launched a Sustainable Healthcare Certification as an arm of their accreditation services. To achieve certification hospitals must first provide baseline emissions data for three greenhouse gas emission sources and an action plan to reduce them; recertification is granted if there are 24 months of data that demonstrate a reduction in greenhouse gas emissions from these three sources. The certification includes evaluation of procurement practices, infrastructure, and use of environmental resources which are particularly relevant for the resource-intensive surgical operations within a hospital [7].

Practice Greenhealth is a membership-based organization for sustainable healthcare that provides U.S. hospitals guidance on improving their facility sustainability. Their "Greening the OR" evaluates heating, ventilation and air-conditioning setback, light-emitting diode surgical lighting, medical device reprocessing, OR kit reformulation, reusable medical products, reusable sterilization containers, fluid management systems, and anesthetic gas reduction [8]. Additionally, they award annual "Environmental Excellence Awards" that recipient health systems often publicize in news media. As of 2022, only 22.9% of U.S. hospitals were Practice Greenhealth members [9, 10]. Moreover, just over 70 hospitals in the United States were recognized with the "Greening the OR Recognition Award" which is gives to hospitals that have reduced the environmental footprint of operating theaters at their facilities. Other health systems should be actively encouraged to participate in these programs, as publicity derived from a certified commitment to sustainability has been proven effective in other industries. The hotel industry and the fashion industry have seen sizeable improvements in profit margins, brand reputation, market claim, and consumer satisfaction by making sustainable changes [11, 12]. While the surgical healthcare sector is fundamentally different from these industries, it is possible that the sentiments that consumers hold towards sustainability may be shared by patients as they decide on their healthcare providers.

Improved bottom-line

It is well-known that surgical care contributes predominantly to the hospital bottom-line [2]. While making sustainable changes in surgical healthcare delivery is inarguably beneficial for the environment and, by extension, the patient, it may also improve a hospital's bottom line. Unfortunately, the initial costs endured by hospitals to make these changes may deter them from getting started. It is important that hospital leaders and the healthcare system realize that initial expenditures are almost guaranteed to be rewarded with an improved profit bottom-line after the initial investment is made. Projections show that the total five-year national savings of hospitals' sustainability interventions in the US is valued at more than $5.4 billion and is expected to triple to over $15 billion in 10 years [13]. The Cleveland Clinic alone saved more than $4 million in 2017 through Practice Greenhealth's Greening the OR strategies [8]. These sizable numbers may also serve as a means of cost-cutting that may be directed towards lowering the surgical healthcare costs borne by patients.

Several other industries have successfully implemented environmental changes that not only benefited the environment but also improved their profitability. For example, companies in the consumer goods sector, like Unilever and Procter & Gamble, have shifted towards sustainable packaging solutions. This not only reduces waste but also improves brand reputation and operational efficiency. Technology giants such as Google and Microsoft have invested heavily in energy-efficient data centers. By optimizing cooling systems and using renewable energy sources, they have reduced energy consumption and operational costs. Finally, using renewable

energy sources is now cheaper than using fossil fuels, and switching shaved an estimated 10% off Google, Facebook, and Amazon's utility bills [14]. These examples demonstrate that environmental changes, when strategically implemented, can lead to improved profitability by reducing costs and enhancing operational efficiency.

Conclusion

As the threat of climate change grows, so does the responsibility of those contributing to it. As a significant contributor towards the global carbon footprint, the surgical healthcare sector must seek to enact measures to go green. The successful environmental initiatives of other countries and industries can be leveraged to guide strategies that less sustainable surgical healthcare systems should adopt. Capitalizing on federal incentives, leveraging the marketing potential of consumer perception, and improving the hospital's bottom-line are three blueprints that may be considered to incentivize surgical healthcare systems to make sustainable changes.

Abbreviations

US United states
OR Operating room
UK United kingdom

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