

# The complications of a carbon-ectomy

*Surgical practices in the NHS are extremely eco-unfriendly. If the service is to honour its net-zero pledges, these must be made greener, but significant barriers stand in the way*

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In 2020, the NHS became the world's first healthcare system to make a net-zero commitment. Its 2040 decarbonisation targets more ambitions than it may seem, given that the organisation is responsible for 6% of the UK's total greenhouse gas emissions.

Surgery is one of the key contributors: operating theatres are responsible for a quarter of all hospital CO<sub>2</sub> emissions, with an annual carbon footprint equivalent to that of 700,000 homes.

To address this problem, some medical professionals are advocating the wider uptake of so-called green surgery principles. Such initiatives are often limited by funding constraints, logistical hurdles and cultural resistance. But some sustainable practices may become more acceptable to clinicians and patients alike as the pressure on them to help tackle the climate crisis grows.

The operating theatre is the biggest consumer of energy in the hospital because of its need to power bright lights, surgical devices and high levels of heating and air conditioning. It is all happening in that small room, explains

Ancel Bhangu, a consultant surgeon and professor of global surgery at University Hospital Birmingham.

He adds that "the number of consumables used in each operation is also massive - far more than for any other hospital procedure. Anaesthetists use gases, which are pumped out into the environment. And at the end you have contaminated waste, which is incinerated."

There are options for offsetting the environmental impact of surgery, including tree-planting and buying carbon credits. But, even if the cost and questionable efficacy of this approach were put aside, it still wouldn't be feasible. Offsetting one year's worth of surgery in the UK would require the creation of a forest more than three times the area covered by Greater London, according to Green Surgery, a 2023 research report published jointly by Brighton and Sussex Medical School (BSMS), the Centre for Sustainable Healthcare and the UK Health Alliance on Climate Change (UKHACC).

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Slashing the number of operations would also be unfeasible, given that there are about 7.6 million people on the waiting list for consultant-led NHS care. The most effective solution, therefore, would be for the service to embrace new technologies, practices and attitudes.

Reliable data on the carbon footprint of surgery was scarce until recently, but research evidence in this field is accumulating quickly. In this respect, the 116-page Green Surgery report can be viewed as a landmark document.

Work on the publication was co-chaired by Mahmood Bhutta, a BSMS professor, consultant surgeon and associate of the Centre for Sustainable Healthcare; Chantelle Rizan, a BSMS doctor, researcher and clinical lecturer; and Elaine Mulcahy, director of the UKHACC.

A key finding of their research is that single-use medical products have become so deeply associated with cleanliness in recent years that clinicians have turned away from reusable equipment, which is equally safe once sterilised.

Take disposable gloves, -for instance: 1.4 billion are used annually in the NHS - "almost enough to stretch to the Moon", Bhutta says. And this is the average figure for a normal year. Faced with the Covid crisis, NHS England ordered nearly 5.5 billion gloves over the 12 months to 24 February 2021, according to the Department for Health and Social Care.

Although gloves are necessary for some invasive procedures, they still pick up and transfer germs in the same way as bare hands, notes Bhutta, who adds that "60% of current glove use in the NHS is inappropriate - people just put them on as a habit. We've got skin, which is a fantastic immune barrier. But this is a very difficult cultural shift."

Surgical gowns and drapes are other disposables causing a massive waste problem. About three-quarters of those bought by the NHS are single-use items.

"There's absolutely no reason for these to be disposable," Bhutta says. They're used for convenience - and because

there's been some serious marketing by their manufacturers."

Surgical procedures can also be decarbonised. In 2022, Bhangu was part of the team that delivered the first documented net-zero operation in the NHS. Sustainability measures included using intravenous anaesthetics rather than gases; wearing reusable gowns, drapes and scrub caps; recycling paper and plastic waste; and working with industry partners to recycle instruments that had been designed as single-use items.

Improvements to processes, materials and practices in surgery can also be rolled out to other parts of a hospital, creating more cost savings and getting the NHS to net zero faster, Bhangu says.

"If you can make decarbonisation work in surgery, you can make it work in the rest of the hospital," he argues. "Our principle is to focus on the operating theatre and then use it as the exemplar."

If NHS staff, managers - and patients - are to embrace green surgery, they will first need to be assured about its safety as well as its eco-benefits, according to Bhutta.

"We also need the government to invest in the infrastructure," he adds. "If we want more sterilisation facilities, we have to build those."

The NHS is under great financial stress, of course, but Bhutta argues that decarbonising is almost always cheaper over time. Switching to a circular-economy model whereby it purchases a laundry service, for instance, makes more financial sense than buying millions of throwaway gowns every year.

NHS procurers "should have a mandate that says we will always prefer buying reusable rather than disposable", Bhutta says. "Even If you're not going to do it to be green, do it to save money. In our hospital in Brighton, even from the few things we've done, we're already saving at least €200,000 annually and we've barely touched the surface yet. We could probably save at least £500,000 every year."

Bhangu notes that decarbonisation is not the highest priority for a beleaguered NHS, acknowledging that it "doesn't have the headspace for green surgery. But we are trying to create that headspace."

He believes that we all have a collective responsibility to demand that the organisation keeps to its net-zero commitments. But, given the strain the NHS is under, it may be individual hospitals and research teams that lead the charge to make green surgery a reality - and, eventually, create a green health service that could become a template for others around the world.