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## CLIMATE CHANGE

# How to make “single use” surgical items more sustainable

**Jennifer Taylor** reports on efforts to reduce the carbon footprint of surgery in the UK

Jennifer Taylor *freelance journalist*

Surgery is a major medical contributor to the United Kingdom’s carbon emissions. Progress is being made on reusing surgical instruments and reducing hospital stays by increasing day case rates, but inertia and a lack of incentives are stalling further steps towards sustainability.

Items that cannot be reused have become the enemy of efforts to tackle climate change. But in medicine—and particularly surgery—they are unavoidably common owing to fear of infection, a situation exacerbated by covid-19 and the use of personal protective equipment.

“There’s clear evidence that reusing drapes, gowns, [and] metal equipment such as suture packs [and] instruments has a much lower carbon footprint than single use,” says Andrew Stevenson, consultant trauma and orthopaedic surgeon at Somerset NHS Foundation Trust and co-chair of the Royal College of Surgeons of England’s sustainability in surgery group. The NHS is responsible for nearly 5% of the UK’s carbon emissions, and operating theatres produce up to 70% of hospital waste.<sup>1</sup>

What has been difficult is obtaining information to enable green choices to be made. “I’ve asked two companies for the carbon footprint of their hip replacements—no, can’t get that,” says Stevenson, adding that manufacturers don’t want to share this information because they think it will put them at a disadvantage. Similarly, an anaesthetist colleague has been unable to find out the carbon cost of producing propofol, the most commonly used intravenous anaesthetic.” The Greener NHS programme has a supplier roadmap to try to improve transparency.<sup>8</sup>

Surgeons are taking things into their own hands with self-organised initiatives at the community level offering practical solutions that could inspire others.

### A dawn in Somerset

Before covid-19 approximately 200 000 hip and knee replacements and about 75 000 hip fracture surgeries were performed in the UK each year, making orthopaedics one of the most active areas of surgery. Stevenson says that it is “highly resource intensive” because of the amount of surgery and the amount of equipment and implants needed. So orthopaedics is ripe for grassroots action.

At Somerset NHS Foundation Trust, most metal instruments for orthopaedic surgery are reused hundreds or thousands of times. In between uses they are processed onsite by the hospital’s clinical sterile services department. Stevenson says that many

trusts have switched from using plastic wraps to reusable metal trays. “Where it’s not happening is down in [the] emergency department and out in primary care. A lot of the suture packs that primary care use are single use, and they just get thrown in the sharps bin. You’ve got to invest in reusable pathways.”

A WhatsApp group of general surgeons has highlighted problems with getting specialist equipment reprocessed. “For example, harmonic scalpels can be reprocessed reasonably cheaply, but there isn’t a pathway available in the UK because the company just wants to sell you new stuff,” says Stevenson. “That’s an ongoing battle.”

Textiles including surgical gowns, drapes, and hats are also potentially reusable, but in Somerset most are still single use. Making the change requires investment and infrastructure. “In the long run it will be cheaper, but from the outset it’s going to cost a bit of money,” he says. Substituting a disposable gown with a reusable alternative is estimated to reduce the greenhouse gas emissions associated with surgical gown use by 66%.<sup>2</sup>

### Reusable catheters?

Electrophysiology catheters have been a target for sustainability, as they are used commonly in catheter ablation for arrhythmias. In addition to plastic, these catheters contain trace elements such as platinum that can require intensive mining.

There has been a move towards “remanufacturing” catheters, not by the original manufacturer but a second company that cleans, fixes, and tests the device and takes responsibility for its safety. A study by Mark Gallagher, consultant cardiologist and electrophysiologist at St George’s University Hospitals NHS Foundation Trust in London, and colleagues compared remanufactured catheters with their first time counterparts.<sup>3</sup> “We found no difference in the number of failures and the duration of the procedure,” he says.

Although the UK has no regulatory barriers to the use of reprocessed catheters, South Africa does. In 2019 the South African Health Products Regulatory Authority issued a directive stating: “Medical devices intended by the original manufacturer for single use may only be used once, may not be reprocessed, and must be disposed of after use.” In 2022, a group of leading academics and doctors, led by John Lazarus, professor and head of the urology division at the University of Cape Town, wrote a letter to the *South African Medical Journal* calling for the regulatory body to rethink this policy.<sup>4</sup>

A year later, Lazarus was granted a meeting with the authority. “That meeting didn’t go very well in terms of getting them to reconsider their decision or at least open up more of a debate,” Lazarus tells *The BMJ*. No clear reason was given for the decision, although he supposes that a major reason might be the need to abide by manufacturers’ recommendations that devices be single use. “That would be their first defence—that they don’t want patient safety to be compromised by contemplating using devices that have been previously used,” Lazarus speculates.

The directive in South Africa is unusual globally, says Lazarus, citing Germany, Japan, and the United States as high income countries that permit reprocessing. “There’s a whole industry around taking devices out of hospitals [and] reprocessing them according to benchmark standards,” he says.

Several urology devices could be safely reprocessed, such as the Dormia basket used to extract kidney stones and the wire loops used to resect benign prostate disease. The loops are surprisingly expensive and can easily be cleaned and safely reused, Lazarus says. “But they say single use on the packaging, and one suspects that that’s a cynical way to maximise profits from the medical device industry.”

There is of course a related economic cost to such a policy. Healthcare systems in many African countries are experiencing financial constraints. In October last year, Zimbabwe’s flagship centre, Parirenyatwa Hospital in Harare, ran out of sutures. Lazarus says: “In the most basic surgical procedure you’re going to have to close the wound with a suture. So it’s quite a frightening, disturbing scenario. That would probably be the norm in many African countries where there is a lack of equipment, and people are forced to reprocess devices because they have no other choice. I would argue that we are in a similar boat. We need to be very spendthrift so that we can provide health for all, which has always been a goal for post-apartheid South Africa.”

## Keeping it going

Surgery done right has notable gains for sustainability. Stevenson says that a hip replacement, for example, has a good chance of lasting 30 years. “And if that stops someone taking painkillers, then that’s a massive win in terms of sustainability because the single biggest [source of] emissions in the NHS is primary care prescriptions.”<sup>5</sup>

Any attempt to avoid unnecessary appointments and hospital stays can also cut emissions. The past couple of years have seen a major change in orthopaedics, with a move towards doing hip and knee replacements as day cases and conducting virtual follow-up appointments. The Somerset trust also has a virtual fracture clinic for consultant led triage of every referral coming into the department, with only some patients requiring a face-to-face hospital appointment.

“These are big wins,” says Stevenson. But another key tenet of sustainability is ensuring that only treatments that will benefit the patient are undertaken. “There are a lot of reasonably low efficacy treatments that just happen because doctors like to treat patients and patients like to be treated even if there’s not a huge amount of evidence base to it,” he adds.

Despite the Greener NHS programme<sup>6</sup> and the NHS net zero pledge,<sup>7</sup> Stevenson argues that environmental sustainability needs to change from being “nice to have to a central plank of healthcare policy.” This might be coming down the track with the Getting It Right First Time programme (<https://gettingitrightfirsttime.co.uk/>), which

advocates high quality, economically sound treatments and, says Stevenson, looks set to add environmental impact.

Gallagher says that financial carrots are a powerful way to move sustainability forward: “There should be meaningful financial incentives for institutions achieving the same amount of patient care delivery at lower consumption of environmental resources.”

And a bright light in a long tunnel is teaching sustainability and environmental health consciousness within the medical curriculum—something Lazarus says is happening at the University of Cape Town. As Lazarus says: “Getting junior doctors to appreciate those issues is a good place to start to change the culture.”

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