Impact Surgery

EDITORIAL

Carbon footprinting for surgical devices

Elizabeth Li

Institute of Applied Health Research, University of Birmingham, B15 2TH, UK.

Correspondence: Dr Elizabeth Li, Institute of Applied Health Research, University of Birmingham, B15 2TH, UK.
Email: elizabeth.li@nhs.net

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Introduction

Medical devices, and in particular the supply chains behind them, may contribute to as much as half of all carbon emissions from healthcare.[1] Each device can have huge variation due to manufacturing processes, freight and shipping, and the mix of raw materials components. £10 billion per year is spent in the UK on medical devices,[2] with over 600,000 different medical devices currently available.[3] The NHS has set a target of reaching net zero by 2040 and to achieve this goal, an ambitious roadmap has been set for suppliers of medical technology. By 2028, regulations will be introduced that require carbon footprinting for all individual products supplied to the NHS.[4]

No substantial development has been made towards completing this task and currently the timelines set by the NHS are unlikely to be achievable. This increase in demand for carbon footprinting in general has seen multitudes of carbon footprinting tools emerge across all industrial sectors, although most are generic and none are fit for purpose to assess specific medical technology devices.[5-7] They cannot provide universally comparable outputs that can be used for purposeful medical procurement. Life-cycle assessments of each device would take decades, are costly, and would be out-of-date as soon as they are completed. Moves by companies in carbon accounting and reducing their carbon impact is admirable but does not provide the granularity at the level of individual devices. Additionally, 80% of the medical devices market is made up of small-medium enterprises and whole company carbon accounting could force many out of competitive markets and stifle innovation.[8] A fit for purpose tool should also be separate from carbon footprinting of large equipment such as scanners, as these items are much more permanent and are highly reliant on maintaining ambient temperatures, consumables, and energy expenditure.[9]

Figure 1 shows an example of a carbon accounting tool that has been created for this article. Such a tool needs to fulfil key requirements:

1. Medical device specific: This tool must account for the reusability element of many medical devices and identify the carbon and environmental impact per use.
2. Intra-device comparisons: an individual feature of a device might not change its overall class whereas the impact of the company and Scope 3 may be far more impactful.
3. Flexible tool: Low burden, low cost, and able to be regularly updated easily.
4. Practicality and speed: Now is the time for developing a pragmatic tool that can rapidly bring the NHS towards achieving net zero procurement.

Carbon labelling devices would help with simplifying decision making and facilitating consistent, impactful

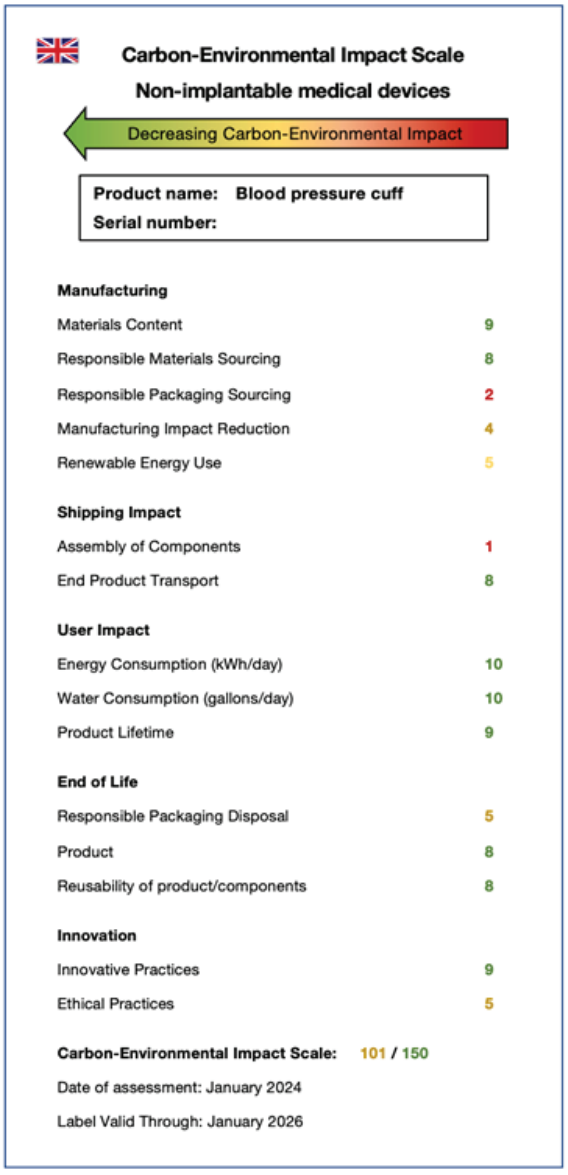
change on the front line, in keeping with the COM-B model of behavioural change.

- Capability: Psychological (Providing knowledge of carbon impact of use of each device),
- Opportunity: Social (Increasing social pressure to preferentially select lower carbon impact devices,
- Motivation: Automatic (Red labelling has automatic impact on 'warning' about environmental 'danger') and Motivation: Reflective (Provides opportunity for higher-level reflection on role of the surgical practitioner in climate change).

To facilitate further development of this tool, a community of key stakeholders are needed that include commercial organisations of different sizes, regulatory bodies, policy makers, and hospital management. Community members could be brought together to input into a Delphi process to create a more holistic functional tool. Maintenance of the tool may be best led by the Medicines and Healthcare products Regulatory Agency, which is a UK body responsible for ensuring that medical devices work and are acceptably safe. The footprinting of individual items can be through self-reporting from parent companies, alongside safety reporting that is already mandatory for medical devices. Alternatively, a standard set of reporting standards agreed by key stakeholders, externally regulated, and followed by frontline procurement leads would have demonstrable benefits. Change can be driven by the frontline. Surgeons retain a high degree of autonomy of their individual practice, can choose which devices they use, and are early adopters of novel med-tech. A groundswell in support of sustainability would catalyse opinion change, choice of devices, and necessitate rapid change to effective measurement and comparison tools. This could mean a shift from 100% disposable to partly reusable devices, which would in turn reduce the impact of the supply chain. It is the supply chain that is the problem, not the energy use in theatre or even disposal, both of which contribute a comparatively tiny amount in carbon emissions. Some devices may have components that have already flown across the world several times before any use in an operating theatre. Therefore, the manufacturing and research and development practices of the supplying company are equal to and in many cases, more important than the components of the device itself.

Finally, maintaining independence is vital. The UK medical devices market is currently valued at $17 billion (USD) and projected to reach $21 billion by 2028.[10] This space is very competitive and highly incentivised to maximise commercial growth. The choice of device or supplier by the NHS can directly shift the longevity of companies, availability of devices and patient outcomes. It is imperative that the same thing is compared, instead of 30 different cherry-picked metrics from different suppliers. Furthermore, there needs to be alignment with the private sector so that sustainable procurement can be rolled out nationally across all parts of healthcare. In order to launch a fully functional tool, we need to establish and test out potential options as a matter of urgency. Departments must climb out of silos and establish meaningful communication. Policy makers and managers need to establish long-term, sustainable incentives and the surgical community must move away from focusing on only immediate outcomes and give serious consideration to reviewing their practice.

Figure 1. Carbon impact scale for medical devices



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