

CASE STUDY

Carbon Footprint Reduction in Shoulder Surgery by the Rationalisation of Single-Use Convenience Packs

Alex Chowdhury, Hannah Imran, Henry Colaço
Hampshire Hospitals Foundation Trust

Introduction

The National Health Service is responsible for a vast carbon footprint, with annual carbon dioxide emissions estimated at over 25 million tonnes, comparable to the national emissions of Sri Lanka. Operating theatres contribute up to 25% of a hospital's emissions.

Problem Statement

To rationalise the composition of the single-use convenience packs in arthroscopic and open shoulder surgery, in order to reduce the annual carbon footprint.

Methods

The individual material composition of all items in the single-use shoulder arthroscopy and open shoulder convenience packs was considered. The carbon footprint of each item was calculated by the application of best available cradle-to-grave emission factors. The items in the packs were then rationalised by consensus (of surgeons and scrub team), removing, reducing or altering unnecessary items. Two new standardised packs were designed and a predicted annual carbon footprint reduction was calculated.

Results

In the 2022/2023 financial year, 296 arthroscopic and 191 open shoulder procedures were performed. This resulted in the use of 890.8kg of single-use non-recycled plastic. The new rationalised packs will result in an estimated annual carbon footprint reduction of 643.8 kgCO₂e.

Conclusion

Through a simple method of single-use convenience pack rationalisation, we can reduce the annual carbon footprint of shoulder surgery by the equivalent of 1,650 miles driven in an average petrol car. This is an underestimate of saving, as the reduction in waste disposal has not been considered. The study has demonstrated a reproducible methodology of carbon footprint calculation and pack reduction that can be applied to other procedures.