



SUSQI PROJECT REPORT: Hip Arthroplasty Positioning Aid

Reducing the CO₂e of Orthopaedic Surgery

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Team Members:

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Background:

Hip arthroplasty is completed with patients in the lateral position. For safety and optimum operating conditions, positioning aids are used to hold the patient in place. These devices are unsterile and the patient is prepped and draped over the top of any positioning devices. Our current practice used a reusable positioning device, with single use foam inserts disposed of in clinical waste. The supplier offers a reusable pad alternative which can be attached to our current positioning device, with an expected longevity of one year per set.

Methods:

Prior to trialling the reusable alternative, we engaged with the orthopaedic surgeons, scrub teams and clinical managers to seek approval to begin a trial. We then obtained a demo set of reusable positioning pads from the company to trial over 2 weeks. Verbal feedback was obtained from surgeons on clinical acceptance prior to purchasing the reusable pads. Initially, we had expected to need to purchase an extension of the device which would have increased our outlay dramatically but on inspection of the trial product, it became clear that we could repurpose the majority of our old attachments. Engaging with the company and physically trialling the product was invaluable to recognising this.

Measurement and results:

Patient outcomes:

We anticipate no change in patient outcome or experience. The reusable pads are however made from a different material and so there is the potential that this material may not support skin integrity as well. Skin integrity of our patients is monitored closely and documented following every procedure. This could be retrospectively examined through monitoring incident reporting following implementation. Clinical acceptance was confirmed through verbal feedback during the trial of the product.



Environmental sustainability:

Carbon emissions were calculated from both the reusable and single use devices considering materials, transportation and waste using carbon emissions factors obtained from BEIS (2022). Savings were then projected annually in kgCO₂e for the disposable pads based on 422 sets used yearly. It is assumed that the reusable pads will need replacing annually as advised by the company and so the savings will be the same year on year.

Table 5: Carbon Footprint of Hip Arthroplasty Positioning Aid		
Single-use/annum (kgCO₂e)	Reusable/annum (kgCO₂e)	Annual Savings (kgCO₂e)
168.37	1.69	166.68

Carbon savings are based on calculations made for two sets of reusable pads that we expect to replace annually versus 422 sets of disposable pads used annually for hip arthroplasty prior to implementation. These savings will therefore be unchanged year on year.

Economic sustainability:

There was an initial outlay of £1167.60 for two sets of reusable pads that we anticipate to replace yearly based on the company's advice. We obtained the financial data for the disposable pads from our procurement department for the financial year preceding implementation.

Table 8: Financial evaluation of single-use vs reusable positioning aid		
Annual cost single use pads	Reusable pads cost (1 year life-span)	Annual savings
£12,304.40	£1197.60	£11,106.80

Despite the need to replace the reusable pads each year, the financial savings from switching are significant and represent a simple but effective way to generate savings which will accrue year on year.

Social sustainability:

Although no formal feedback was obtained, the pads were received positively by surgeons and anaesthetic staff who are responsible for preparing the positioning equipment. Due to the reusable nature, the pads did not need changing after each case, or need stocking up, which reduced labour time for practitioners. We did have to return a set of the reusable pads after several months after a seam split. This was replaced free of charge from the supplier, and the integrity has been raised with the manufacturer. We will continue to monitor this going forward.



Discussion:

Our aim for this project was to implement a 'green surgery' within the 2 orthopaedic theatres and to achieve this we wanted to implement as many carbon reducing initiatives as possible. The limited time frame of this project was one of our barriers to completing all our projects. It became evident that to enable change to happen in a complex environment like the operating theatres it can involve many stakeholders. It is important that these stakeholders are engaged early on in the project as some of the processes of engagement can be lengthy.

Patient and staff safety remains of paramount importance, and we must address the potential exposure to risk when implementing new processes. We have addressed issues and concerns around infection control and exposure to anaesthetic gases through developing processes to mitigate risk and seeking advice from specialist practitioners. Seeking approval from divisional governance has also helped us to consider any potential areas for harm so that we could mitigate these.

Going forward, we aim to ensure that these initiatives become embedded into daily practice, through review and audit of our processes. The aspects of our project that are yet to be implemented will be prioritised, and data collection ongoing to measure the impacts across the triple bottom line and improve sustainable value in our department.

Conclusions:

This project represented a huge source of unnecessary waste. This is a niche product, highlighting that practitioners working clinically are well placed to identify areas for improvement. Whilst the carbon savings in this project are arguably small, the financial savings are significant which is important considering that other sustainability initiatives require investment to reap considerable carbon savings.

References

- Department for Business, Energy & Industrial Strategy (2022). Greenhouse gas reporting: Conversion factors 2022. Retrieved from: [Greenhouse gas reporting: conversion factors 2022 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022)

