



## SUSQI PROJECT REPORT:

### Spinal anaesthesia – Rationalisation of procedure packs Reducing the CO2e of Orthopaedic Surgery

**Start date of Project: 20th May 2024**

**Date of Report: 16th August 2024**

#### Team Members:

- Laura Vale - Senior Operating Department Practitioner, [laura.vale@hhft.nhs.uk](mailto:laura.vale@hhft.nhs.uk)
- Krithea Baker - Recovery Nurse Practitioner, [krithea.baker@hhft.nhs.uk](mailto:krithea.baker@hhft.nhs.uk)
- Dr Jaco DeBeurs - Specialist Doctor Anaesthetics, [jaco.debeurs@hhft.nhs.uk](mailto:jaco.debeurs@hhft.nhs.uk)
- With special thanks to Oliver Grassby (CT2 Anaesthetics), Jessica Lynch (CT1 Anaesthetics), Alhan Al-Sammak (Speciality Doctor) & Ellie Watson.

#### Background:

The majority of lower limb arthroplasty surgery, in addition to caesarean sections take place under spinal anaesthetic. To undertake this, a procedure pack is used containing the items needed to perform this. Due to changes over time and variances in practice, a number of the items on our procedure packs are discarded without use. We plan to rationalise these packs to minimise wastage, which is a recommendation presented in the Green Surgery Report (2023).

#### Methods:

We reviewed our spinal procedure packs, engaging all relevant stakeholders and ensuring everyone had the opportunity to input into the new pack specification. This was achieved through informal discussion, email and a survey polling preferences. It was important for us to minimise waste from the pack whilst retaining convenience for urgent caesarean sections. Stakeholders included procurement, anaesthetists and anaesthetic practitioners. We were then required to obtain quotations from three companies. Once all stakeholders were satisfied with the specification, the new pack was signed off and entered production. At present, we are waiting to use up stock of our old packs before we introduce the new product. We encountered challenges during the process due to variances in preference between clinicians but it was decided that selecting the most commonly used items to best represent the majority would be most successful.

#### Measurement:

##### *Patient outcomes:*

We anticipate minimal change to patient outcomes or experience. There is potential risk reduction in reducing the number of syringes on the sterile field to avoid confusion between subcutaneous and intrathecal drug preparations. This could be retrospectively examined through monitoring incident reporting once the pack is established.



### *Environmental sustainability:*

Carbon emissions were calculated by considering the unnecessary items from the old pack not included in the new procedure pack. These items were; foam sticks, syringes (5ml and 10ml), NRfit syringe 5ml and gauze swabs. The GHG emissions associated with these items were estimated using a process based approach. Emissions for both the raw materials and transportation of these items were accounted for by weighing the raw materials and converting into carbon using carbon emissions factors taken from the Department for Business, Energy & Industrial Strategy (BEIS) (2024). Total emissions for these items were then projected annually using annual usage data for FY 2023-2024 to give annual savings in kgCO<sub>2</sub>e. The remaining items on the pack were not accounted for as these would remain the same in the new pack, as did the manufacturer.

### *Economic sustainability:*

Financial data for our current packs was obtained from our procurement department. We included data for the whole trust, not only orthopaedics as this change will be implemented trust wide. Financial data for the proposed pack was by quotation from the company directly based on the new specification.

### *Social sustainability:*

We expect minimal impact on social outcomes. There have been many anecdotal comments of frustration around wastage and so we hope this will be alleviated. Feedback was not formally obtained beyond the inclusion of stakeholders in decisions around what to include.

### **Results:**

#### *Environmental sustainability:*

<b>Table 2: Carbon Footprint data from spinal pack rationalisation</b>			
<b>Components removed from pack</b>	<b>Saving/item (kgCO<sub>2</sub>e)</b>	<b>Total saving/pack (kgCO<sub>2</sub>e)</b>	<b>Projected Annual Saving based on 3790 packs (kgCO<sub>2</sub>e)</b>
<b>Leur slip syringes (5ml &amp; 10ml)</b>	0.0176	0.1437	<b>544.62</b>
<b>Gauze swabs</b>	0.0620		
<b>NRFit 5ml syringe</b>	0.0213		
<b>Foam sticks</b>	0.0428		

Each component of the pack was sourced from a different supplier, ranging from the UK to as far as China, making considerable contributions to transport associated emissions. Interestingly, the item that was routinely thrown away for every case came from China. The savings per pack are



minimal but the volume of packs used per year is significant resulting in moderate carbon savings that will accrue year on year.

*Economic sustainability:*

<b>Table 5: Financial evaluation of rationalised spinal pack</b>	<b>Current Pack</b>	<b>New Pack</b>
<b>Cost/Pack</b>	£6.46	£5.55
<b>Cost of overwrap items</b>	£8.28	£6.24
<b>Spinals performed/year</b>	3790	3790
<b>Annual Spend</b>	£55,864.60	£44,684.10
<b>Anticipated annual saving</b>		<b>£11,180.50</b>

The new pack has led to a change in the required consumables to be added to the pack. We have therefore included these changes when considering the variations in cost. Both the pack and the change in additional consumables offered financial savings.

*Social sustainability:*

We are waiting for the new packs to arrive from our supplier due to the need to use our old stock, feedback was therefore not available at the time of writing. However, the pack specification has been circulated to anaesthetic staff who are familiar with all components of the pack with positive feedback and a feeling of doing good stemming from creating less unnecessary waste.

**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:

Prior to starting this project, we initially planned to only remove the unused foam sticks from the packs. Once we began to research and engage with suppliers, it became apparent that there was further waste within the packs and that we should aim to rectify. The most challenging aspect of this study was the requirement to gather quotations from three suppliers and ensure that the final pack was acceptable to all of our clinicians, which involved multiple changes over the course of the project. The key learning was that even seemingly simple changes require significant time, engagement and resources to drive them forward. Reflecting on the usefulness of this project, we believe that this is a small but arguably beneficial change addressing unnecessary waste that is likely relevant across all of our surgical procedure packs and is something we hope to rectify in the near future.

### 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)
- Green Surgery Report 2023, [Green Surgery Report – UK Health Alliance on Climate Change](#)

