

# Sustainable Surgery: Cutting Carbon Emissions in Trauma Care

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## Project Background:

Orthopaedic trauma surgery is a major burden on the NHS and environment globally. We aimed to reduce carbon footprint of the commonly performed procedures in Orthopaedic trauma surgery.

Challenges faced were predominantly for delivering day case trauma service. We proposed a planned day case trauma service through utilisation of fracture clinic bays as day care beds would be advantageous.

## Project Aims/Objectives:

**Aim:** Reduce carbon footprint of orthopaedic trauma surgery.

**Objective 1:** To assess waste generated and suggest changes to reduce the carbon footprint in an orthopaedic trauma theatre.

**Objective 2:** To assess the impact of planned day case trauma surgery.

## Project Approach:

We conducted a detailed inventory of all surgical instruments and consumables. Examined scope 2 emissions with a focus on water usage and energy consumption in the theatre. Attended the Centre for Sustainable Healthcare (CSH) "Carbon footprinting for healthcare" course in April 2023 to help gain more expertise in this project.

Working together we designed a new fracture clinic day care surgery model for walking wounded trauma patients based at Wrexham Maelor hospital.

## Project Outcomes:

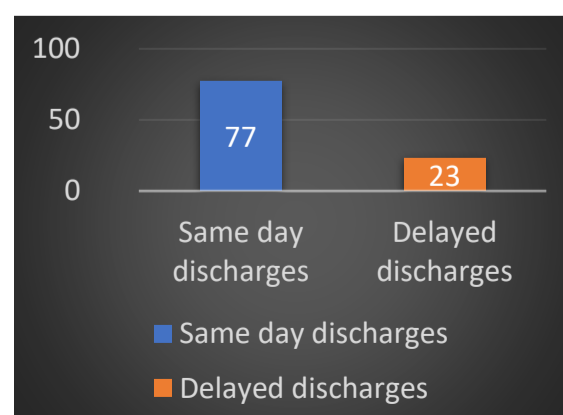
The establishment of a planned day case service "fit for purpose" adequately supported within the Orthopaedic department at Wrexham Maelor Hospital.

A starting process in promoting sustainable practices in trauma surgery within the Orthopaedic department at Wrexham Maelor Hospital.

## Project Impact:

The beneficiaries of the new day care surgery service model for the year 2023 were 299. This achieved same day discharge of 77% with no complications/failed discharges. This had a significant impact on patient and staff wellbeing, service efficiency, cost saving and improved patient experience.

Gaining an understanding of the carbon footprint of trauma surgery will lead to improved indirect health outcomes. This knowledge will serve as a good starting point in driving the agenda of sustainable healthcare.



## Key Conclusions:

Carbon footprint of Orthopaedic trauma surgery common procedures is as follows:

- Dynamic Hip Screw-39.458 KgCo2e
- Hip Hemiarthroplasty-49.637 KgCo2e
- Femur Nailing-39.462 KgCo2e
- Ankle fracture fixation-35.759 KgCo2e
- Wound debridement- 29 KgCo2e.

New fracture clinic day care model we treated 299 patients in 2023 and saved 115 inpatient bed days which accounts to saving of £142,025.

## Next Steps:

The identified carbon intensive practices will be reviewed and changes suggested for implementation within the department, with the hospital's Green Group to target wider surgical specialties. We will encourage adoption and spread of our findings through channels such as "Better by Betsi", "BCUHB intranet case study" and publishing our fracture clinic pathway in a journal such as the BMJ QIP.