#1652 - Systematic Review / Posters

Implant Waste And Associated Costs In Trauma And Orthopaedic Surgery: A Systematic Review

General Topics / Implants, Biomaterials & Registry Study

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Background
Trauma and orthopaedic (T&O) surgery is one of the most wasteful specialties due to their dependence on implants and associated single-use materials such as metal work (nails, screws, plates). Sustainable solutions are vital to accommodate for increasing life expectancies and dependency on healthcare for improved quality of life, such as hip and knee arthroplasties.

Objectives
Our primary objective is to quantify T&O implant waste, and secondarily investigate associated hospital costs. We will also look at contributing factors which can be used to inform future guidelines for implant waste and encourage sustainable practice.

Study Design & Methods
Following PRISMA guidelines, we searched three databases (Scopus, PubMed, Embase) through MeSh terms, such as “implant waste” and “trauma and orthopaedic surgery”. Cohort studies and randomised control studies were included where there was sufficiently reported implant waste in T&O surgical patients.

Results
Our results included 11 articles, screened from 2,145. Implant waste occurrence ranged between 0.8-25.1% of all T&O procedures (with an average cost of $167,139.13. Trauma surgery saw more waste than elective orthopaedic surgeries, especially lower-limb trauma. Screws and nails were amongst the most wasted material (up to 91% and 48% respectively), and surgical implants contributed to up to 42% of all waste during T&O surgery. Total knee and hip arthroplasties, some of the most common procedures, were most likely to waste implants.

Human error was a large reason for many cases of implant waste, such as the surgeon changing their mind, incorrect size opened and contamination. To minimise human errors, a study investigated the effect of an electronic-label system that enforces double checking the correct implant for type, size, side, and material – this yielded promising results and reduced wastage rates by 86%.

Conclusions

Balancing theatre waste and hospital costs with maintaining patient safety and optimal care is a challenge for many clinicians, particularly in emergency trauma procedures where resources usage cannot be planned. Human factors contribute largely to implant waste, so future guidelines or improvement projects could focus on addressing human error.

This is the first study to quantify implant wastage and costs in T&O surgery. We hope to see more institutions investigating and sharing their theatre wastage so we can identify key contributors and use this to inform future guidelines.