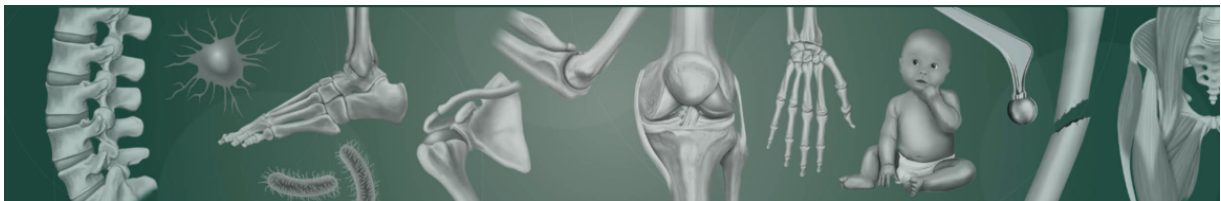

Acta Orthopaedica

Nordic Approach – Global Impact



June 2025

Dear NOF members, and readers of Acta Orthopaedica

Highlights

Please find below 2 highlights of recently published articles. One is on “Adherence to the RSA and CT-RSA guideline”, and the other on “Reducing surgical trays to cut both carbon emissions and costs in total knee arthroplasty”.

Environmental sustainability and the carbon footprint

We all strive to support environmental sustainability and reduce carbon emissions. Orthopaedic procedures are among those with the highest carbon footprint. The key question is how we can effectively contribute, and what actions truly make a difference. Moreover, how can we adapt to new protocols (1)? Several factors play a critical role.

Sustainability factors

- Use of single-use instruments and devices
- Implant manufacturing and logistics
- Imaging
- Water usage
- Waste segregation and recycling
- Clinical practice adjustments, like in the present study
- Institutional changes like green teams

Carbon footprint of the operating room

The operating theatre is a major contributor to carbon emissions, 20–30% of a hospital's total waste, 3–6 times more energy intensive than other hospital area

- Energy consumption of the operating rooms requires continuous climate control (temperature and humidity), HEPA filtration, and lighting.
- Anesthetic gases
- Waste management
- Instrument sterilization

Reference: 1) Environmental Sustainability Initiatives in the Operating Room. Annals of Surgery Open (2024) 3:e451

On behalf of the Editorial team,

Søren Overgaard

Editor-in-chief

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Selected Highlights

Adherence to the RSA and CT-RSA guideline items in clinical prosthesis migration studies: a systematic review

Thies J N van der Lelij, Lennard A Koster, Bart L Kaptein, Rob G H H Nelissen, Perla J Marang-van de Mheen

Acta Orthopaedica, 96, 2025, 380–386.

Harmonization data reporting: A reminder of the importance of compliance to guidelines.

The harmonization of data reporting is essential for advancing clinical research and improving patient outcomes. This study serves as a timely reminder of the importance of adhering to established reporting guidelines.

Total joint replacement has been hailed as the "operation of the century," transforming the lives of millions suffering from hip and knee joint pain[1]. National joint registries report excellent implant survival rates at 20 years. However, complications still occur, and some patients require revision surgery—often due to implant loosening.

To reduce this risk, implant designs and bone cements are continuously refined. Yet, because loosening is now relatively rare, it can take years to accumulate enough failures to detect problems with new devices.

To address this, researchers have developed radiostereometric analysis (RSA)—a technique considered the gold standard for assessing early implant migration and predicting long-term loosening risk.

The International Radiostereometry Society recently updated its reporting guideline, introducing a 32-item checklist to enhance data consistency across studies. The goal is to facilitate data pooling, enabling high-level evidence to inform implant selection and ultimately improve patient satisfaction.

In this context, a group of Dutch researchers evaluated 285 RSA studies to assess their adherence to the updated guidelines. Notably, none of the studies fully complied with all checklist items. The average adherence rate was 61%, with wide variation (ranging from 1% to 100%). Crucial information—such as the timing of baseline and follow-up RSA exams and the statistical analysis method—was often missing.

Studies who fail to report these agreed upon important variables cannot be included in synthesized data analysis such as systematic reviews and meta-analyses. Any study that cannot contribute to an aggregated data analysis is a missed opportunity to impact clinical practice. This study underscores the urgent need for better compliance with reporting guidelines to improve the quality, interpretability, and clinical relevance of RSA research in arthroplasty.

[1] Learmonth ID, Young C, Rorabeck C. The operation of the century: total hip replacement. *Lancet*. 2007 Oct 27;370(9597):1508-19. doi: 10.1016/S0140-6736(07)60457-7. PMID: 17964352.

Co-editor

Per-Henrik Randsborg

Reducing surgical trays to cut both carbon emissions and costs in total knee arthroplasty

Pim W van Eemond . Paul I odder

Acta Orthopaedica, 96, 2025, 394–400.

This study explores how optimizing surgical tray usage in total knee arthroplasty (TKA) can reduce both environmental impact and healthcare costs. Operating rooms are major contributors to hospital waste and carbon emissions, and the number of surgical trays used during procedures plays a significant role.

They retrospectively analyzed primary TKA procedures performed between 2012 and 2022 at a teaching hospital in the Netherlands and developed a predictive model using demographic and anthropometric data to estimate the appropriate femoral prosthesis size before surgery. They focused on reducing the total number of trays needed and performed a post-hoc analysis to estimate the carbon emission cut and cost reduction.

The model achieved a 97 % accuracy rate in predicting the correct size range, allowing the surgical team to eliminate one tray from the standard set-up and thereby reducing total tray use by 11 %. The estimated savings from this reduction were 1.03 kg CO₂ eq and €30 per tray removed.

This article tackles two major challenges in modern healthcare: environmental sustainability and cost efficiency. By showing that surgical tray usage in TKA can be reduced through accurate preoperative planning, the study offers a concrete way to lower both environmental impact and financial costs with small changes without compromising patient care. A greener healthcare and smarter resource use are most relevant for all of us.

Co-editor

Marianne Westberg

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