A Comparative Assessment of Efforts for Operating Room Sustainability across Different Specialties and Opportunities for Improvement in Neurosurgery

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Introduction

• Surgical intervention is costly, both for the economy and the environment.

• Approximately 10% of U.S. greenhouse gas (GHG) emissions originate from the health care sector, and operating rooms (OR) produce up to 70% of the hospital’s total waste.

• Given the complex procedures with long hours, neurosurgical cases are expected to generate a significant carbon footprint, but it is unclear what field-initiated efforts are being done for environmental stewardship.

• Aim: To understand the state of research on OR sustainability and assess the role of neurosurgery in the context of the current literature.
Methods

• A comprehensive literature search using PubMed/MEDLINE was performed using the following combinations of keywords:
  • “operating room” “surgery” “sustainability” “environmental impact” “greenhouse gas” “ecological impact” “waste reduction”

• Exclusion criteria
  • Papers not translated into English
  • Abstracts without a full article
  • Commentaries
  • Reviews
Results (1)

• A total of 40 studies were included, the majority of which (60%) were conducted in the U.S., followed by the U.K. (13%) and Canada (5%).

• Studies were published between 1994 and 2019, with 90% of them conducted after 2010.

• The areas of focus comprised waste reduction (63%), carbon footprint/GHG emission (28%), environmental attitudes of OR personnel (8%), and water conservation (3%).
Results (2)

• Life-cycle assessment, surveys, and waste quantification were the frequently employed methods.

• Most studies (68%) suggested economic cost-effectiveness.

• Fewer studies were led by neurosurgery departments (8%) compared to general surgery (15%), anesthesiology (13%), plastic surgery (10%), or orthopedic surgery (10%).

• All three studies in neurosurgery focused on waste reduction.
Discussion

• Despite the increasing number of studies on OR sustainability, neurosurgery-specific reports are still sparse.

• A disproportionate amount of attention is being given to waste reduction, which may result in only a modest reduction of the total environmental footprint.

• Further efforts in neurosurgery will lead to “greener” ORs with potential cost-saving benefits.
Thank You