



# Addressing the Environmental Impact of Interventional Radiology Practices: A Call to Action

Arsalan Nadeem<sup>1</sup>  Ali Husnain<sup>2</sup>

<sup>1</sup> Department of Medicine, Allama Iqbal Medical College, Lahore, Pakistan

<sup>2</sup> Department of Interventional Radiology, Northwestern University, Chicago, Illinois, United States

Arab J Intervent Radiol 2024;8:49–50.

Address for correspondence Arsalan Nadeem, MBBS, Department of Medicine, Allama Iqbal Medical College, Allama Shabbir Ahmad Usmani Road, Lahore 54700, Punjab, Pakistan (e-mail: arsalannadeemh@gmail.com).

We write to express our concern and propose strategies to address the environmental impact associated with interventional radiology (IR) practices, a topic gaining increasing recognition within the healthcare community. Drawing insights from recent studies, it is evident that IR procedures contribute significantly to greenhouse gas emissions and generate substantial amounts of waste.<sup>1–5</sup>

Woolen et al<sup>1</sup> underscored the exponential increase in waste burden with the growing complexity of IR procedures. Their findings reveal the environmental consequences, with neurointerventional procedures alone producing an average of 8 kg of waste per case. The urgent need for attention to these issues is further highlighted by Chua et al,<sup>2</sup> who conducted a life cycle assessment to quantify the greenhouse gases emitted by an IR department over a week, revealing a staggering 23,500 kg CO<sub>2</sub>e.

Shum et al<sup>3</sup> provided valuable insights into the specific sources of waste, emphasizing the extensive packaging of single-use IR devices as a significant contributor. Notably, 54.8% of the overall weight of IR products consisted of waste, with 76% deemed potentially recyclable. This aligns with the concerns raised by Clements et al,<sup>4</sup> who conducted a comprehensive analysis of the weight and waste associated with various IR products.

The collective findings from these studies highlight the urgent need for systematic changes in IR practices to mitigate their environmental impact. We propose a multifaceted approach:

1. Optimizing packaging: Engage with suppliers to redesign procedure packs according to local preferences, minimizing unnecessary items and packaging. Reformulate procedure packs to eliminate items not used regularly, packaging them individually for occasional use.<sup>3</sup>
2. Recycling initiatives: Implement strategies to enhance the recycling of packaging materials and potentially

recyclable waste from IR products. Clements et al emphasize the importance of strategic placement of bins and sustained efforts to recycle, even during busy periods.<sup>4</sup>

3. Reusing items: Promote the reuse of items where possible, decreasing the use of supplies designed for single use in favor of reprocessible alternatives.<sup>2</sup>
  4. Adopting environmentally preferable purchasing: Encourage the practice of environmentally preferable purchasing, prioritizing products with a lower environmental impact and long-term cost from production to disposal.<sup>3</sup>
  5. Enhanced education: Provide education to IR staff regarding the environmental impact of procedures, costs associated with unused disposable supplies, and alternatives for reducing waste.<sup>3</sup>
  6. Monitoring inventory: Implement strategies such as the “first in, first out” method, consignment programs, and rotating out materials to the supplier before expiration to reduce waste associated with expired inventory.<sup>3</sup>
- Adopting these measures will not only contribute to reducing the carbon footprint of IR practices but also promote cost savings for hospitals and suppliers. As the global community increasingly recognizes the urgency of environmental sustainability, addressing the environmental impact of IR practices becomes imperative for the well-being of both patients and the planet.

## Authors' Contribution

All authors had access to the data and a role in writing this manuscript.

## Conflict of Interest

None declared.

## References

- 1 Woolen SA, Kim CJ, Hernandez AM, et al. Radiology environmental impact: what is known and how can we improve? *Acad Radiol* 2023;30(04):625–630

© 2024. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution License, permitting unrestricted use, distribution, and reproduction so long as the original work is properly cited. (<https://creativecommons.org/licenses/by/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

DOI <https://doi.org/10.1055/s-0044-1781453>.  
ISSN 2542-7075.

- 2 Chua ALB, Amin R, Zhang J, Thiel CL, Gross JS. The environmental impact of interventional radiology: an evaluation of greenhouse gas emissions from an academic interventional radiology practice. *J Vasc Interv Radiol* 2021;32(06):907–915.e3
- 3 Shum PL, Kok HK, Maingard J, et al. Sustainability in interventional radiology: are we doing enough to save the environment? *CVIR Endovasc* 2022;5(01):60
- 4 Clements W, Chow J, Corish C, Tang VD, Houlihan C. Assessing the burden of packaging and recyclability of single-use products in interventional radiology. *Cardiovasc Intervent Radiol* 2020;43(06):910–915
- 5 de Reeder A, Hendriks P, Plug-van der Plas H, et al. Sustainability within interventional radiology: opportunities and hurdles. *CVIR Endovasc* 2023;6(01):16