

# **Implementation of Enhanced Recovery After Surgery recommendations in adult cardiac surgery across the United Kingdom: a national survey**

## **Authors**

Yunxi Guan<sup>1</sup>, Rhys Petrie<sup>3</sup>, Abdullah Chisti<sup>2</sup>, Matt Petty<sup>1</sup>, Narain Moorjani<sup>1,2</sup>, Nicola Jones<sup>1,2</sup>

## **Affiliations**

1. Royal Papworth Hospital NHS Foundation Trust, Cambridge, United Kingdom
2. University of Cambridge, Cambridge, United Kingdom
3. Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust, United Kingdom

## **Background**

Recovery of elective cardiac surgical services remains a major priority for the UK National Health Service (NHS), in the context of pandemic-related disruption and increasing patient complexity [1]. Enhanced Recovery After Surgery (ERAS) programmes provide a coordinated, multidisciplinary approach to improve perioperative efficiency, reduce length of stay and increase surgical capacity [2]. Although ERAS has been formalised in cardiac surgery through recent consensus guidelines [3], the extent to which it is delivered as an integrated perioperative programme in routine UK practice is unclear.

## **Methods**

We conducted a national cross-sectional survey of UK adult cardiac surgical centres using a structured questionnaire based on the 2024 ERAS cardiac consensus recommendations. Responses were consolidated into a single centre-level dataset. Implementation of 23 recommendations, excluding ventilation during cardiopulmonary bypass, was defined a priori and analysed descriptively. Free-text responses were analysed thematically to identify enablers, barriers and support requirements.

## **Results**

Responses were obtained from all 34 UK adult cardiac surgical centres delivering NHS care.

The median number of recommendations implemented per centre was 14/23 (61%; range 35–91%). No centre reported full implementation, and implementation varied substantially between centres: 7/34 (21%) implemented  $\geq 75\%$  of recommendations, whereas 10/34 (29%) implemented  $\leq 50\%$  (Figure 1).

Centres also varied in which individual recommendations they had implemented (Figure 2). Practices aligned with established perioperative workflows—such as transoesophageal echocardiography (85%), multimodal analgesia (85%) and surgical-site infection prevention (82%)—were widely implemented. In contrast, recommendations requiring organisational coordination, including multidisciplinary ERAS teams (18%), prehabilitation (21%) and acute kidney injury care bundles (18%), were less consistently adopted.

Implementation did not show a consistent relationship with strength of evidence. Qualitative findings indicated that adoption was shaped by organisational factors, including clinical leadership, multidisciplinary engagement and protocolisation, while barriers included resource constraints, staffing pressures and resistance to change. Free-text responses suggested that centres with higher levels of implementation more commonly described established multidisciplinary programmes and routine audit processes, whereas lower-implementing centres described fragmented, clinician-dependent approaches.

## **Conclusions**

ERAS principles are widely present in UK adult cardiac surgical practice but are not consistently delivered as a coordinated perioperative programme. Implementation is incomplete and variable, with organisational capability rather than evidence alone influencing adoption. In the context of constrained perioperative capacity, this pattern may limit the contribution of enhanced recovery to improving patient flow and surgical throughput. Efforts should therefore prioritise consistent programme-level delivery supported by multidisciplinary coordination, core recovery processes and linkage to outcomes at a national level.

## Acknowledgements

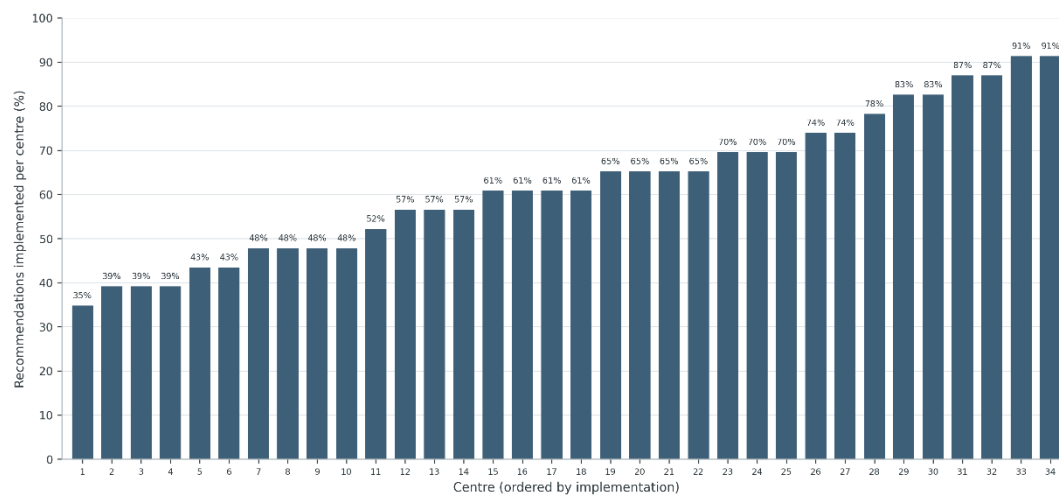
The authors thank the Association for Cardiothoracic Anaesthesia and Critical Care and the Society for Cardiothoracic Surgery in Great Britain and Ireland for supporting survey distribution. We are also grateful to all respondents who contributed to the study.

## References

1. NHS England. *2024/25 priorities and operational planning guidance*. 2024. Available from: <https://www.england.nhs.uk/wp-content/uploads/2024/03/PRN00715-2024-to-2025-priorities-and-operational-planning-guidance-27.03.2024.pdf>. Accessed 21 April 2024.
2. Lau CSM, Chamberlain RS. Enhanced Recovery After Surgery programs improve patient outcomes and recovery: a meta-analysis. *World J Surg* 2017;41:899–913.
3. Grant MC, Crisafi C, Alvarez A, et al. Perioperative care in cardiac surgery: a joint consensus statement by the Enhanced Recovery After Surgery Cardiac Society, ERAS International Society, and the Society of Thoracic Surgeons. *Ann Thorac Surg* 2024;117:669–689.

## Figure legends

**Figure 1. Centre-level implementation of ERAS recommendations in adult cardiac surgery across the United Kingdom.** Bars represent the proportion of ERAS recommendations implemented at each centre (n=34), based on the 23 recommendations included in implementation scoring. Centres are ordered by overall implementation percentage.



**Figure 2. Recommendation-level implementation of ERAS recommendations in adult cardiac surgery across the United Kingdom.** Bars represent the proportion of centres (n=34) reporting implementation of each recommendation. Recommendations are grouped by perioperative phase. The recommendation relating to ventilation during cardiopulmonary bypass is presented descriptively and was not included in implementation scoring.

