Postoperative Critical Care Facilities in the United Kingdom: Not as Simple as 1-2-3

DJN Wong[1-3], JR Bedford[1-3], M Chazapis[2, 3], L Farmer[3], D Saunders[4], SK Harris[5] and SR Moonesinghe[1-4] for the SNAP2 investigators.

1. Department of Applied Health Research, University College London
2. University College London Hospitals NIHR Surgical Outcomes Research Centre
3. National Institute of Academic Anaesthesia Health Services Research Centre, Royal College of Anaesthetists
4. The Newcastle upon Tyne Hospitals NHS Foundation Trust
5. University College London Hospitals NHS Foundation Trust

Introduction

- Despite NCEPOD and RCS(England) recommendations, patients at high risk of complications do not always receive appropriate postoperative critical care. Reasons for this may include:
  - Inadequate critical care facilities in the UK vs. other countries.
  - Use of alternative facilities to provide postoperative critical care
- The Second Sprint National Anaesthesia Project: Epidemiology of Critical Care provision after Surgery (SNAP-2: EPICCS) study is a prospective observational cohort study investigating the provision of planned critical care after inpatient surgery in the UK, Australia and New Zealand.[1]
- As part of SNAP-2: EPICCS, we conducted a census of critical care facilities in all potential participating UK hospital sites.

Method

- Questionnaires designed using a modified Delphi consensus method.
- Electronic forms were sent to all potential SNAP-2: EPICCS Principal Investigators prior to patient recruitment.
- Data collected:
  - Hospital-level characteristics, e.g.: general hospital and adult ICU/HDU bed numbers, types of tertiary services delivered and the presence of an emergency department.
  - Ward/Unit-level characteristics, e.g.: staffing ratios and availability of critical care treatment modalities.
  - If present, details of enhanced ward areas where high risk adult patients would be admitted post-op for increased levels of care.

Results

- Responses were received from **257** hospitals (**97.7%** response rate). **Table 1** shows the overall characteristics of hospitals which responded.
- UK hospitals typically have a median **2.7** critical care beds per 100 hospital beds [IQR: **2.1-4.3**].
- **72** hospitals (**28.0%**) reported having enhanced care ward areas for high risk patients not admitted to ICU/HDU postoperatively.

Table 1: Overall characteristics of participating hospitals.

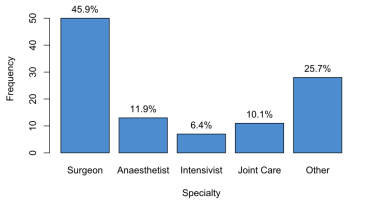
	Overall (n = 257)	England (n = 211)	Scotland (n = 25)	Wales (n = 15)	Northern Ireland (n = 6)
Hospital beds (median [IQR])	450 [290-650]	450 [300- 650]	492 [230-615]	400 [281-560]	375 [260-457]
Emergency Departments (%)	207 (80.5%)	166 (78.7%)	21 (84.0%)	14 (93.3%)	6 (100.0%)
Total General Surgical beds (median [IQR])	121.5 [70-189]	120.5 [70-188]	134 [73-190]	130 [57-199]	135.5 [60.5- 179]
Total Critical Care beds (median [IQR])	12 [8-21]	13 [8-20]	16 [8-34]	11 [7.5-13]	9 [6.5-10]
Total Ventilated beds (median [IQR])	8 [6-13]	9 [6-14]	6 [4-9.25]	7.5 [5.25- 8.75]	6 [3-7]
Crit. Care beds per 100 Hospital beds (median [IQR])	2.7 [2.1-4.3]	2.6 [2.0-4.1]	4.0 [3.2-5.2]	2.7 [2.0-3.7]	2.4 [2.1-2.8]
PACU (%)	6 (2.3%)	5 (2.4%)	1 (4.0%)	0 (0.0%)	0 (0.0%)
Enhanced Care wards (%)	72 (28.0%)	61 (28.9%)	5 (20.0%)	5 (33.3%)	1 (16.7%)

- **109** Enhanced care areas reported: typically small units with approx. 3:1 patient:nurse ratios, increased monitoring and other therapies (**Table 2**).

Table 2: Enhanced ward areas

	Overall (n = 109)	England (n = 88)	Scotland (n = 7)	Wales (n = 12)	Northern Ireland (n = 2)
Enhanced care beds (median [IQR])	4 [3-7]	4 [3-8]	4 [2.5-4.5]	4 [3-4.25]	8 [6-10]
Patient:Nursing ratio (mean (sd))	2.56 (1.05)	2.51 (1.03)	3.29 (0.95)	2.58 (1.24)	2.00 (NA)
Continuous monitoring (%)	94 (86.2%)	77 (87.5%)	5 (71.4%)	10 (83.3%)	2 (100%)
Epidural (%)	74 (67.9%)	61 (69.3%)	4 (57.1%)	7 (58.3%)	2 (100%)
Invasive BP monitoring (%)	66 (60.6%)	54 (61.4%)	2 (28.6%)	8 (66.7%)	2 (100%)
Vasoactive infusions (%)	46 (42.2%)	37 (42.0%)	2 (28.6%)	7 (58.3%)	0 (0%)
CPAP/NIV (%)	37 (33.9%)	31 (35.2%)	2 (28.6%)	4 (33.3%)	0 (0%)
Ventilation (%)	6 (5.5%)	5 (5.7%)	1 (14.3%)	0 (0%)	0 (0%)

Fig. 1: Enhanced Care Ward Consultant Responsibility



- Enhanced care ward areas tend to be managed by Surgeons (**Fig. 1**).

Discussion

- Critical care bed capacity per capita in the UK is low compared to many other developed health systems, and high risk patients are not consistently admitted for postoperative critical care.[2,3]
- Enhanced ward areas capable of delivering higher levels of postoperative care (vs. usual ward level care) may have evolved to compensate.
- These areas may be thought of as “Level 1.5” areas, to borrow from traditional critical care classification terminology.
- More research into the delivery of care and outcomes of patients managed in these Level 1.5 beds needs to be conducted.
- This data will be included in planned analyses for SNAP-2: EPICCS.

References

1. Moonesinghe SR, Wong DJN, Farmer L, Shawyer R, Myles PS, Harris SK. SNAP-2 EPICCS: the second Sprint National Anaesthesia Project—EPIdemiology of Critical Care after Surgery: protocol for an international observational cohort study. BMJ Open. 2017 Sep 1;7(9):e017690.
2. Adhikari NK, Fowler RA, Bhagwanjee S, Rubenfeld GD. Critical care and the global burden of critical illness in adults. The Lancet. 2010; 376(9749):1339–1346.
3. Findlay GP, Goodwin AP, Protopapa K, Smith N, Mason M. Knowing the risk. National Confidential Enquiry into Patient Outcome and Death (NCEPOD). 2011.

Acknowledgements

Thank you to our funders:
- NIAA (AAGBI Project grant)
- Royal College of Anaesthetists
- UCLH NIHR Surgical Outcomes Research Centre (SOuRCe)

Follow us on Twitter: @SNAP2EPICCS