NELA
National Emergency Laparotomy Audit

Eighth Patient Report of the National Emergency Laparotomy Audit

December 2020 to November 2021

RCOA Royal College of Anaesthetists | NIAA National Institute of Academic Anaesthesia HSRC Health Services Research Centre | Royal College of Surgeons ADVANCING SURGICAL CARE | HQIP Healthcare Quality Improvement Partnership

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Executive Summary

NELA National Emergency Laparotomy Audit

Results from 2020–2021 – the Eighth Year of the National Emergency Laparotomy Audit

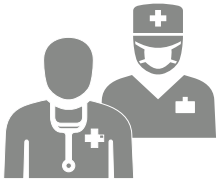
Principal performance statistics are available here.

1. **22,132** patients who had **emergency bowel surgery** in England and Wales were included in the Year 8 audit **from 173 hospitals**

2. Improvements in mortality have levelled off – **in-hospital mortality was 9.2%** compared to **9.1% in Year 7** and **9.6% in Year 6**

3. **86.8% of patients** received **a preoperative assessment of risk** (up from 85% last year, and 56% in Year 1)

4. **86.4% of patients with a high documented risk** had **consultant surgeon** input before surgery

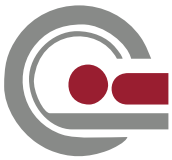


71.5% of patients with a high documented risk had **consultant anaesthetist** input before surgery

5. Patients with **sepsis suspected at time of arrival in hospital** waited a median of **15.6 hours from time of admission** until surgery

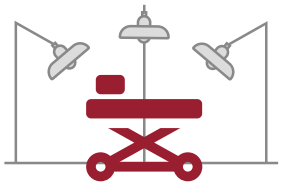
6. **Median time to antibiotics in patients with suspected sepsis** was **3.0 hours** from arrival in hospital

7. **91.8% of patients** received a preoperative CT scan (92.5% in Year 7)



26.3% of patients had their scan reporting outsourced (19.1% in Year 7 and 17.8% in Year 6)

8. Presence of both **anaesthetic and surgical consultants during surgery** in high-risk patients was **91.3% (90.2% in Year 7)**



9. **79.1% of high-risk patients** were admitted to critical care postoperatively (82.3% in Year 7); **15.7% of high-risk patients** were admitted to a normal ward

10. **55.3% of patients** were over the age of 65 and **17.7% of patients** were over the age of 80. **Only 31.8% of patients** 80 or over, or 65 and frail, had geriatrician input (26.8% in Year 7)

11. **Median length of stay** was **highest for those with an unplanned return to theatre** – 29 days – compared to 10 days for all patients

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The NELA Project Team and Board would like to express their thanks to all staff at NHS trusts and Welsh health boards who have collected and submitted data this year. Thank you to all NELA Anaesthetic and Surgical Leads for their leadership, hard work, and enthusiasm. The success of NELA over the last eight years, and the enormous benefits to patients through improved care, would not have been possible without your continued engagement.

The NELA Project Team and Board would also like to thank the members of the NELA Clinical Reference Group for helping to shape the dataset and report, in particular Dr Arturo Vilches-Moraga (British Geriatrics Society), Dr Sally-Anne Wilson (Royal College of Emergency Medicine), Dr James Stephenson (Royal College of Radiologists), Mr Nicholas Lees (Royal College of Surgeons of England) and Dr Simon Varley (Emergency Laparotomy Collaborative). Members of the NELA Project Board and Clinical Reference Group at the time of writing can be found in Appendix 1.

1 NELA Key Messages and Recommendations

KEY MESSAGE 1

In Year 8 of the audit, 22,132 adults required emergency laparotomy (emergency bowel surgery) in England and Wales.

- Over half were aged over 60
- Half were assessed as high-risk (with a 30-day mortality risk of 5% or greater)
- Half were assessed as requiring surgery within six hours of decision to operate
- A quarter were assessed as having sepsis on arrival at hospital, rising to a third at the time of decision to operate
- More than half received postoperative critical care
- 9.2% of patients died in hospital. Median length of stay amongst survivors was 10 days

Recommendations

1.1 Hospitals should continue to engage further with NELA data collection. In particular, make use of real-time data and resources available from NELA to drive clinical and service quality improvement. These include quarterly hospital, regional and national data reports; excellence and exception case-reporting tools; and process measure and mortality monitoring tools available via the NELA website.

1.2 Funded time within consultant job plans should be available to support invaluable work and contributions by members of clinical teams in collecting data, and coordination and service improvement overseen by NELA surgical, anaesthetic, radiology and emergency medicine local clinical leads. This requires trust/health board recognition of the value of this work.

1.3 Trusts and health boards should support NELA data collection and analysis with funded audit and governance assistance.

(Audience/s: Trust Boards; Medical Directors; Clinical Directors; hospital clinical audit departments; and consultants in anaesthesia, critical care, surgery, radiology, emergency medicine, and elderly care)

KEY MESSAGE 2

Most patients (91.8%) who underwent emergency laparotomy (emergency bowel surgery) benefitted from preoperative computerised tomography (CT) scanning. A significant proportion (26.3%) of scans were reported using outsourced radiology expertise – this has been highlighted previously as increasing the risk of discrepancy between CT reports and findings at surgery.

Recommendations

2.1 Ensure NELA leads for radiology are appointed in each department, with specific job planned time to facilitate coordination of multidisciplinary review meetings and radiology events and learning meetings (REALM). Conclusions should be shared where applicable with providers of outsourced reporting services.

(Audience/s: Medical Directors and Clinical Directors of radiology and surgery)

KEY MESSAGE 3

Patients experienced long delays from time of arrival at hospital to time of surgery, including those with sepsis suspected at arrival in hospital (median 15.6 hours to theatre). Delays were largely during the assessment, diagnostic and decision-making pathways rather than following decision to operate.

Recommendations

3.1 Multidisciplinary teams in emergency, surgical, perioperative, acute and critical care should work to produce and implement locally agreed optimised pathways of care, with the aim of streamlining diagnosis with as little delay for patients as possible.

(Audience/s: Clinical Directors; consultant surgeons, emergency physicians, radiologists, anaesthetists and intensivists, together with senior nursing colleagues in their respective departments and with support from their respective management teams)

KEY MESSAGE 4

Many patients (77.7%) with suspected sepsis on arrival did not receive antibiotics within an hour of arrival in hospital. There was wide variation between hospitals in delays before antibiotics were given – median time to administer antibiotics in this group of patients was 3.0 hours [interquartile range: 1.2–6.8 hours].

Recommendations

4.1 Clinical teams should be supported by management teams to work together to identify where and why existing standards around antibiotic administration are not being met.

4.2 Clinical teams should establish and introduce locally agreed pathways for administration of antibiotics preoperatively for those with suspected intra-abdominal infection or sepsis, following guidance around timeliness from the Academy of Medical Royal Colleges and the Surviving Sepsis Campaign.

4.3 Clinical/nursing teams should ensure that locally agreed pathways support the administration of antibiotics, without delay, at the time of prescribing.

(Audience/s: Clinical Directors; consultant surgeons, emergency and general physicians; microbiologists, anaesthetists and intensivists, together with senior and specialist nursing colleagues, and with support from their respective management and prescribing/pharmacy teams)

KEY MESSAGE 5

One in five high-risk patients did not receive postoperative care in a critical care unit.

Recommendations

5.1 Surgeons, anaesthetists and intensivists should ensure a formal assessment of mortality risk has been performed around the time of decision to operate, taking into account the significant impact of frailty.

5.2 Clinical teams should not hesitate to refer a high-risk patient for postoperative monitoring in critical care, even if not currently critically ill.

5.3 Trusts/health boards should ensure critical care capacity is able to meet demand. Any critical care capacity shortfall should be reviewed as part of departmental and hospital-level clinical governance.

(Audience/s: Executive Boards; Medical Directors; Clinical Directors; consultant and training grade surgeons, anaesthetists and intensivists, together with their respective management teams and senior nursing colleagues)

KEY MESSAGE 6

Frailty doubled the risk of mortality amongst those patients aged 65 and over (13.0% vs 5.9%). However, review by a member of the elderly care team was associated with a significant reduction in mortality (5.9% vs 9.5% amongst non-frail patients, and 13.0% vs 22.3% amongst frail patients). Despite some units showing excellent performance, elderly care involvement in the care of elderly and frail patients following emergency laparotomy is not routine practice in many hospitals.

Recommendations

6.1 A formal assessment of frailty should be performed for all patients aged 65 or over.

6.2 Surgeons, anaesthetists and intensivists should ensure frailty has been taken into account when assessing the mortality risk of their patients as the NELA risk score does not take frailty into account.

6.3 Trusts/health boards should work towards improving capacity for experts in elderly care to review all elderly, frail and vulnerable patients postoperatively. This liaison work on surgical wards should happen on a systematic and consistent basis rather than in an ad hoc manner. In many hospitals this goal is likely to require specific trust/health board support and funding.

(Audience/s: Executive Boards; Medical Directors; Clinical Directors in surgery and elderly care; geriatricians, surgeons and anaesthetists, together with their respective management and senior nursing colleagues)

2 Standards against which NELA Audits

1. Hospitals which admit patients as emergencies must have access to both conventional radiology and computerised tomography scanning 24 hours per day with immediate reporting
2. An assessment of mortality risk should be made explicit to the patient and recorded clearly on the consent form and in the medical record
3. Trusts and health boards should ensure theatre access matches need and ensure prioritisation of access is given to emergency surgical patients ahead of elective patients whenever necessary
4. Each high-risk case should be reviewed before surgery by a consultant surgeon, consultant anaesthetist, and consultant intensivist
5. Each high-risk case should have a consultant surgeon and consultant anaesthetist present in theatre during surgery
6. All high-risk patients should be admitted to critical care after surgery
7. Each patient aged 65+ and frail or 80+ should have multidisciplinary input that includes early involvement of geriatrician teams
8. Frailty should be assessed using a validated scoring system in all patients aged over 65*
9. Timeliness of antibiotic administration*
10. Unplanned returns to theatre*
11. Unplanned critical care admissions*
12. Postoperative length of stay*

Notes

Consultants are defined as doctors on the Specialist Register, Certification of Completion of Training (CCT) holders, and those recognised as being equivalent by the relevant Royal College. (As per NHS seven day services clinical standards, February 2022).

As of Year 5 of NELA data collection, all patients are assumed to be high-risk, unless the NELA risk score is less than 5% AND the patient was considered to be low-risk according to clinical judgement (where documented). Therefore, either a NELA risk score of ≥5% or clinical judgement that a patient is high-risk will put a patient into the high-risk category. Where the NELA risk model is incomplete and cannot be calculated, the patient will be assumed to be high-risk.

Please note inclusion and exclusion criteria for the audit are defined by the patient's surgical condition and the operation performed, rather than by the surgical approach. Both laparoscopic ('keyhole') and open (laparotomy) approaches are included whenever the term laparotomy is used within this report. Please see here for more information.

*Measured and reported data; not red, amber, green (RAG) rated.

3 Introduction

This report is the eighth annual report of the National Emergency Laparotomy Audit (NELA). It examines care received by NHS patients in England and Wales undergoing emergency laparotomy (emergency bowel surgery) between 1 December 2020 and 30 November 2021. The COVID-19 pandemic continued to have a significant impact on patients, staff, and hospitals during this period, and maintaining adequate staffing levels was a major challenge for many healthcare organisations. It is right to recognise and applaud the degree to which standards of care were maintained for patients. The dedication of clinical teams in achieving this is commended.

Over the last eight years, there has been improvement in various aspects of care around emergency laparotomy, such as direct consultant delivered care in theatre, length of postoperative hospital stay, and mortality. But specific concerns remain around delays in pathways of care for many patients between time of arrival in hospital and definitive surgical intervention ('door-to-surgery time'). Both time to administration of first antibiotics, and overall time to arrival in theatre are unacceptably long and detrimental for many patients with suspected intra-abdominal infection.[1–3] Surgeons, emergency and general physicians, radiologists, anaesthetists, intensivists and geriatricians, together with their respective hospital management teams, are encouraged to work together to address these delays. They should also engage with the wider healthcare team including radiographers and nursing staff on wards, emergency departments (EDs) and in theatres, as service improvements for patients can only come about with the cooperation and support of all those involved in the care of the emergency laparotomy patient.

Collection of NELA data allows continuous evaluation of performance against UK standards at hospital and at regional level. NELA modifies annual data collection to reflect changes in national standards and clinical practice, whilst continuing to analyse care processes and outcomes. Much variation remains in these measures between different hospitals. Clinicians, hospital teams, executive boards, and commissioners must address this variation. They should aim to continually improve patient outcomes at a local level by analysing and reflecting upon comparative NELA data available through the NELA online webtool. NELA data, both locally collated, and that reported centrally by NELA, is available in real-time to support quality improvement initiatives throughout the patient pathway, starting at initial presentation and continuing to beyond hospital discharge. Data should be used to ascertain where investments or improvements could be made along the patient pathway (particularly at 'front door' presentation) to effect more consistent achievement in meeting national standards.

A large number of clinical and non-clinical staff have contributed significant time and energy into collecting NELA data, and a further large group have contributed to this report. We would like to thank all those who have worked so hard for their patients and the wider NHS, and also thank in advance all those who will consider the content of this report and continue to make efforts to improve services offered to our patients.

NELA will continue to update audit metrics to reflect new published standards and guidelines. Patients should be assured that organisations which actively engage and participate in NELA continue to assess whether they are providing the best quality care, and that there is continuous evaluation of safety, effectiveness, and timeliness of emergency laparotomy care.

A glossary of terms and abbreviations used throughout this report can be found in Appendix 2.

4 Case Ascertainment

Case ascertainment for hospitals in England is pending receipt of Hospital Episode Statistics (HES) data from NHS Digital. It is anticipated this will be available for publication (with annual trends in case ascertainment) in June 2023. Case ascertainment for hospitals in Wales is presented in Table 1. There were 12 eligible hospitals in Wales, all of which provided data for Year 8.

The total number of hospitals included in the Year 8 report across England and Wales is 173.

Table 1. Case Ascertainment

	Total number of locked records included in Year 8	Overall case ascertainment in Year 8 (%)[1]
England	20,594	
Wales	1,538	82.9
Overall	22,132	

[1] Data for England is pending receipt of HES data.

5 Who has an Emergency Laparotomy?

Emergency laparotomy patients are heterogeneous in their characteristics, socioeconomic backgrounds, presenting physiological condition, and underlying surgical pathology. All patients need consistently high standards of care to be readily accessible to achieve the best possible outcomes. Table 2 presents the baseline characteristics of patients included in the audit.

Table 2. Patient characteristics

	Number	Proportion (%)
Total patients analysed	**22,132**	
Age group		
18–29	977	4.4
30–39	1,403	6.3
40–49	2,004	9.1
50–59	3,417	15.4
60–69	4,378	19.8
70–79	6,032	27.3
80–89	3,502	15.8
90+	419	1.9
Gender		
Male	10,595	47.9
Female	11,537	52.1
Emergency laparotomy following elective surgery	1,054	4.8
Preoperative risk score[1]		
High-risk (≥5%)	10,572	47.8
Low-risk (<5%)	11,560	52.2
Recorded surgical urgency[2]		
Immediate (<2 hours)	2,335	10.6
Urgent (2–6 hours)	8,474	38.3
Urgent (6–18 hours)	7,454	33.7
Expedited (>18 hours)	3,858	17.4
Sepsis on arrival[3]		
Yes	5,459	25.9
No/unknown	15,619	74.1
Sepsis at decision to operate[4]		
Yes	7,113	32.1
No/unknown	15,019	67.9

Operation performed (5 most common)		
Adhesiolysis	3,930	17.8
Small bowel resection	3,206	14.5
Colectomy: right	3,097	14.0
Hartmann's procedure	2,820	12.7
Colectomy: subtotal	1,198	5.4
Findings at surgery (5 most common)		
Adhesions	6,336	28.6
Perforation – small bowel/colonic	4,659	21.1
Intestinal ischaemia	2,493	11.3
Abscess	2,246	10.1
Colorectal cancer	2,191	9.9
Surgical approach		
Open	17,408	78.7
Laparoscopic	2,461	11.1
Laparoscopic assisted	341	1.5
Laparoscopic converted to open	1,922	8.7
Stoma formation[5]		
Yes	8,266	37.4
No	13,863	62.6
Direct admission to critical care postoperatively		
All	11,532	52.1
≥5% risk group	8,333	79.1
≥10% risk group	4,939	85.5

[1] High-risk includes those denoted as high-risk on the NELA risk calculator, or by clinical judgement, or when risk has not been documented[4]

[2] Urgency recorded at the time of booking of case (Question 3.22); excludes 11 patients with missing data

[3] Sepsis on arrival is defined as a 'yes' response to Question 2.11a 'Was sepsis, with a National Early Warning Score 2 (NEWS2) ≥5 or ≥3 in any one variable or another diagnosis requiring urgent antibiotics e.g. peritonitis/perforation, suspected on admission?'; **excludes elective admissions**

[4] Sepsis at decision to operate is defined as a 'yes' response to Question 2.11b 'Was sepsis with a NEWS2 ≥5 or ≥3 in any one variable and/or another diagnosis requiring urgent antibiotics e.g. peritonitis/perforation, suspected at the time the decision for surgery was made?'

[5] Excludes 3 patients with missing data

6 Main Key Findings

NELA audits care against a set of key standards (see here). Hospitals are rated against these standards (Red, Amber, Green [RAG]; see footnote). RAG tables provide a summary of hospital performance indicators and are available here. Table 3 below presents national data trends over time in the NELA key standards.

Table 3. Trend in key NELA standards

Key Standard	Key Process Measure	Year 5 (Dec 17–Nov 18)	Year 6 (Dec 18–Nov 19)	Year 7 (Dec 19–Nov 20)	Year 8 (Dec 20–Nov 21)
Hospitals which admit patients as emergencies must have access to both conventional radiology and CT scanning 24 hours per day, with immediate reporting	Proportion of patients who received a preoperative CT report by an in-house consultant radiologist	62.4 N=24,841	62.4 N=25,267	65.3 N=22,481	58.3 N=22,132
An assessment of mortality risk should be made explicit to the patient and recorded clearly on the consent form and in the medical record	Proportion of patients in whom a risk assessment was documented preoperatively	77.1 N=24,841	83.8 N=25,267	85.0 N=22,481	86.8 N=22,132
Trusts/health boards should ensure theatre access matches need and ensure prioritisation of access is given to emergency surgical patients ahead of elective patients whenever necessary[1]	Proportion of patients arriving in theatre within a time recorded as appropriate for the urgency of surgery – this metric assesses the interval between decision to operate, and arrival in theatre	72.3 N=20,564	73.5 N=20,936	70.4 N=18,693	71.8 N=18,263
Each high-risk patient should be reviewed by a consultant surgeon, anaesthetist, intensivist[2]	Proportion of patients with a preoperative risk of death ≥5% who had input from a consultant surgeon AND consultant anaesthetist prior to surgery	87.7 N=12,084	91.3 N=12,118	63.5 N = 10,846	69.1 N=10,572
	Proportion of patients with a preoperative risk of death ≥5% who had input from a consultant surgeon prior to surgery	95.5 N=12,084	96.9 N=12,118	84.3 N=10,846	86.4 N=10,572
	Proportion of patients with a preoperative risk of death ≥5% who had input from a consultant anaesthetist prior to surgery	90.7 N=12,084	93.8 N=12,118	66.9 N = 10,846	71.5 N=10,572
	Proportion of patients with a preoperative risk of death ≥5% who had input from a consultant intensivist prior to surgery	65.8 N = 12,084	71.3 N = 12,118	30.4 N = 10,846	34.0 N=10,572

Key Standard	Key Process Measure	Year 5 (Dec 17–Nov 18)	Year 6 (Dec 18–Nov 19)	Year 7 (Dec 19–Nov 20)	Year 8 (Dec 20–Nov 21)
Each high-risk patient should have a consultant surgeon, anaesthetist present in theatre during surgery	Proportion of patients with a preoperative risk of death ≥5% for whom BOTH consultant surgeon and consultant anaesthetist were present in theatre	83.7 N=12,084	88.5 N=12,118	90.2 N=10,846	91.3 N=10,572
	Proportion of patients with a calculated preoperative risk of death ≥5% for whom a consultant surgeon was present in theatre	92.6 N=12,084	94.8 N=12,118	96.3 N=10,846	96.4 N=10,572
	Proportion of patients with a preoperative risk of death ≥5% for whom a consultant anaesthetist was present in theatre	89.0 N=12,084	92.4 N=12,118	93.2 N=10,846	94.1 N=10,572
All high-risk patients should be admitted to critical care postoperatively	Proportion of patients with a postoperative risk of death ≥5% who were directly admitted to critical care postoperatively	81.8 N=12,071	85.2 N=12,196	82.3 N=10,770	79.1 N=10,537
Each patient aged 65 or over and frail (Clinical Frailty Scale [CFS] ≥5) or 80 or over should have multidisciplinary input that includes early involvement of geriatrician teams[3]	Proportion of patients aged ≥65 years and frail or ≥80 years who were assessed by a member of the geriatrician-led multidisciplinary team during any part of the perioperative pathway	27.5 N=5,339	29.1 N=7,145	26.8 N=6,385	31.8 N=6,167
Timeliness of antibiotic administration*	Median [interquartile range (IQR)] time (hours) between hospital arrival and antibiotic administration amongst those with sepsis on admission	3.2 [1.3–6.5] N=6,263	3.0 [1.2–6.7] N=4,846	3.0 [1.2–6.5] N=4,144	3.0 [1.2–6.8] N=4,067
Frailty assessment in patients aged 65 and over*	Assessment of frailty using a validated scoring system in all patients aged over 65	N/A	86.9 N=14,166	91.8 N=12,478	86.5 N=12,245
Median [IQR] postoperative length of stay*		11 days [7–19 days] N=22,263	11 days [7–19 days] N=22,830	10 days [6–17 days] N=20,439	10 days [6–18 days] N=20,090
Unplanned return to theatre (proportion)[4]*		5.9 N=24,473	5.6 N=24,992	5.4 N=22,264	5.3 N=21,920

Key Standard	Key Process Measure	Year 5 (Dec 17–Nov 18)	Year 6 (Dec 18–Nov 19)	Year 7 (Dec 19–Nov 20)	Year 8 (Dec 20–Nov 21)
Unplanned admission to critical care (proportion)*		3.4 N=24,564	3.0 N=25,057	3.2 N=21,715	3.1 N=21,983
In-hospital mortality rate[5]*		10.4 N =24,841	9.6 N=25,267	9.1 N=22,481	9.2 N=22,132

RAG Rating: Standards of care are rated Green: ≥85%, Amber: 55–84%, Red: <55% with the exception of the proportion of patients aged 65 or over and frail or 80 or over who were assessed by an elderly care expert, which is rated Green: ≥80%, Amber: 50–79%, Red: <50%. Font colours represent RAG ratings.

Some figures may differ from last year's published RAG tables. This takes into account any updated data subsequently provided by local teams.

[1] In previous years, patients with missing data (date of decision to operate OR date of arrival in theatre) were excluded from analysis. NELA updated the definition of this metric in Year 8 so that these patients are now included in the analysis. The numbers for Years 5 through 7 have been updated accordingly, which is why they may differ from previous reports.

[2] Between Years 6 and 7, there was a change in question wording – Years 5 and 6 asked about perioperative involvement of a consultant anaesthetist and intensivist, whereas Years 7 and 8 asked about preoperative involvement of these consultants.

[3] Question wording around geriatrician input has varied over the years and therefore results between years are not directly comparable.

[4] In previous annual reports, this process measure included unplanned returns to theatre only. In Year 8, NELA updated the definition to include both planned AND unplanned returns to theatre. The numbers for Years 5 through 7 have been updated accordingly, which is why they may differ from previous reports.

[5] This data is in-hospital mortality rather than 30-day mortality data derived via the Office for National Statistics as previously published. We have used in-hospital mortality as this was the only data available at the time of publication.

*Not RAG rated

7 Radiology

- **Most patients underwent computerised tomography (CT) scanning prior to emergency laparotomy**
- **There has been a further increase in the proportion of outsourced reports compared with previous years**

Hospitals must have 24-hour access to CT scanning and reporting resources. Table 4 shows that 91.8% of patients had a CT scan preoperatively following their admission, and the vast majority (99.7%) of these scans were reported by a radiologist (Table 5). There is variation in the proportion of patients undergoing CT scanning by urgency of surgery (Table 5). Reduced proportions of patients at each end of the urgency spectrum undergo CT scans. A pressing need for definitive treatment may have precluded CT scanning in the most urgent group; alternatively, some patients in the expedited group may have had outpatient investigation and imaging has not been repeated on admission.

Radiology remains under considerable workforce pressure.[5] **63.4% of patients underwent a CT scan subsequently reported by an in-house consultant radiologist. 26.3% of CT scans were reported by an outsourced consultant-delivered service** (Table 4) – a significant increase from last year's report (19.1%) and a further rise from previous years. Previous NELA reports[6–9] have highlighted that discrepancy rates are highest amongst those scans with outsourced reports, and it is essential that trusts/health boards formally share learning with their outsourcing service providers. Discrepancy data was not collected in the NELA Year 8 dataset.

Table 4. Method of CT scan reporting

	CT scan preoperatively n (%)	In-house report by registrar n (%)	In-house report by consultant n (%)	Outsourced report n (%)	No report[1] n (%)
England	18,972 (91.8%)	1,876 (9.9%)	12,058 (63.6%)	4,969 (26.2%)	
Wales	1,348 (91.8%)	139 (10.3%)	834 (61.9%)	374 (27.7%)	
Overall	20,320 (91.8%)	2,015 (9.9%)	12,892 (63.4%)	5,343 (26.3%)	70 (<1%)

[1] Suppressed for England and Wales due to small numbers

Table 5. Percentage of patients receiving a preoperative CT scan according to stated level of urgency

Recorded urgency of surgery	CT performed n (%)	CT reported (%)
Immediate (<2 hours)	2,096 (89.8%)	99.2%
Urgent (2–6 hours)	8,004 (94.5%)	99.5%
Urgent (6–18 hours)	6,939 (93.1%)	99.9%
Expedited (18+ hours)	3,272 (84.8%)	99.8%
Total	20,311 (91.8%)	99.7%

8 Risk Assessment

Preoperative formal mortality risk assessment has become a firmly established process for emergency laparotomy patients in England and Wales and is documented in 86.8% of patients (see Supplemental Table 1).

9 Timeliness of Arrival in Theatre

- **Many patients experienced prolonged assessment, diagnostic and decision-making pathways following arrival at hospital and prior to the decision to operate, such that timeliness of care falls short of national standards**

Despite updated national guidelines[4] recommending prompt source control of infection, and several studies demonstrating associated reduction in mortality,[1, 2, 10–13] significant numbers of **patients continue to experience unacceptable delays from time of arrival at hospital to time of arrival in theatre ('time to surgery')** (Table 6). It is likely that these delays are associated with worse outcomes.

To illustrate the scale of delays for even the most unwell of emergency admissions, Table 6 shows the interval between arrival at hospital and arrival in theatre for patients with a number of 'indicators of sepsis', i.e., those who were hypotensive (systolic Blood Pressure [BP] <90mmHg) (15.0 hours), those suspected to have sepsis on arrival (15.6 hours) or at decision to operate (17.2 hours), or those predicted to have gross intraperitoneal soiling (13.7 hours).

It is acknowledged that some patients are actively treated with a trial of non-operative management, for example adhesional small bowel obstruction,[14–15] which ultimately, and intentionally, delays their time to emergency laparotomy. It is not possible to quantify or separate these patients within the Year 8 NELA dataset but active decisions made for non-operative management are being captured in the Year 9 dataset.

Table 6. Timeliness of arrival in theatre from arrival at hospital for non-elective admissions with recorded markers of intra-abdominal sepsis[1]

	Indicators of Sepsis			
	Preoperative systolic BP <90mmHg (n=673)	Sepsis suspected at time of arrival (n=5,249)	Sepsis suspected at time of decision to operate (n=6,339)	Predicted gross peritoneal soiling (n=4,531)
Time from arrival at hospital until arrival in theatre (median [IQR])	15.0 hours [6.0–47.2 hours]	15.6 hours [7.5–47.0 hours]	17.2 hours [8.0–49.9 hours]	13.7 hours [7.2–41.0 hours]

[1] This table includes 18,390 patients with known dates/times of arrival in hospital and arrival in theatre

Time of 'arrival at hospital to arrival in theatre' versus 'decision to operate to arrival in theatre'

National standards state that trusts/health boards should ensure theatre access matches need, and prioritisation of access is given to emergency surgical patients ahead of elective patients where necessary. This standard is reported through the process measure of the proportion of patients arriving in theatre 'within an appropriate timescale'. To date, NELA has largely reported performance in this measure from the point of decision to operate to arrival in theatre using the National Confidential Enquiry into Patient Outcome and Death (NCEPOD).[16] More recent guidance from the Royal College of Surgeons of England[4] and the ERAS Society[17] describes care bundles for non-operative management, non-immediate surgery and immediate surgery including 'a time-compliant operation that, for patients with septic shock or sepsis requiring operative source control, is underway within a maximum of three hours or six hours respectively'. NELA metrics will be updated to reflect new standards for treatment of sepsis in surgical patients.

71.8% of emergency laparotomy patients arrive in theatre within the NCEPOD urgency timescales recorded around the time of decision to operate (Table 3 and Table 7). It must be emphasised that this metric does not reflect the findings above of probable unacceptable and excessive delays in the patient pathway *prior to* the decision to operate.

Table 7. Timeliness of arrival in theatre for non-elective and elective admissions from point of decision to operate[1]

	Sepsis Markers			Recorded NCEPOD Surgical Urgency Category		
	Preoperative systolic BP <90mmHg (n=684)	Sepsis suspected at time of decision to operate (n=6,440)	Predicted gross peritoneal soiling (n=4,685)	Immediate (within 2 hours) (n=2,127)	Urgent (within 2–6 hours) (n=7,583)	Urgent (6–18 hours) (n=6,415)
Time from decision to operate until arrival in theatre (median [IQR])	1.8 hours [1.0–3.0 hours]	2.5 hours [1.5–5.0 hours]	2.5 hours [1.5–4.5 hours]	1.5 hours [1.0–2.5 hours]	2.8 hours [1.8–4.5 hours]	5.8 hours [2.8–15.2 hours]

[1] This table includes 19,319 patients with known dates/times of decision to operate and arrival in theatre

Heavy demand pressures within EDs may contribute significantly to delays in definitive decision-making and surgical management for patients requiring emergency laparotomy. Once an ED becomes full, it becomes increasingly difficult to assess and prioritise newly arrived patients, as examination and treatment space become difficult to find. 'Crowding' in departments due to 'exit block' has been highlighted as not only undignified and inhumane, but also a major public health concern in the UK – patients cannot be moved onwards in their diagnostic and treatment pathways because hospital wards are themselves full.[18] Jones *et al*[19] have shown an association between delays to patient admission from ED, with one extra death for every 82 delayed admissions (amongst all diagnostic groups).

The interval between decision to operate and arrival in theatre accounts for only about 20% of the total time taken between arrival at hospital and arrival in theatre. Eighty percent of the time taken in the patient pathway is accounted for prior to decision to operate, i.e., arrival in hospital, triage, clinician assessment, imaging and reporting, specialist review, and decision-making. Trusts/health boards should formally consider and review (using NELA dashboards), at least annually, the resources required to reliably assess (within one hour for those with National Early Warning Score 2 [NEWS2] ≥5 or those anticipated to need surgery) and care for surgical patients.[4, 20] Any shortfall must be urgently addressed.[4]

Given the unprecedented pressures EDs in England and Wales are currently facing, and the lengths of patient pathways presented in Table 6, it has to be the responsibility of both clinicians and hospital management teams to work together to deliver surgical 'care bundles' from the time of presentation to hospital. Clinical teams should move away from the concept that urgency of surgery is only defined at the time of decision to operate.[4]

10 Management of Patients with Intra-Abdominal Infection

- **Many patients with suspected severe intra-abdominal infection did not receive prompt antibiotics**
- **There was wide variation between trusts/health boards in delays before antibiotics are administered**

22.3% of emergency laparotomy patients with suspected sepsis at admission received antibiotics within an hour of arrival in hospital and 25% waited for almost 7 hours or more (Table 8). There is clear guidance that suspected sepsis must be treated promptly.[4, 10, 13, 17, 20–22] As described in Section 9, for many patients, the journey through the diagnostic pathway is unacceptably long – so it cannot be argued there is insufficient time to organise and administer antibiotics prior to transfer to theatre.

Guidelines from the Academy of Medical Royal Colleges published in October 2022[20] address the balance between prompt initiation of broad-spectrum antimicrobial therapy and antimicrobial stewardship. It is recommended that surgical patients receive antibiotics within a maximum of one hour of diagnosis of septic shock (NEWS2 ≥7) and three hours of diagnosis of sepsis (NEWS2 = 5 or 6). Guidance also states that when patients with a NEWS2 of ≥5 are likely to require an emergency procedure to control a presumed surgically-remediable source of sepsis, urgency should be escalated to that for a patient with a NEWS2 of 7 or more – they should receive appropriate antimicrobials within one hour, preferably after collection of blood cultures, be reviewed urgently by senior surgical and intensive care clinicians and undergo emergency control of the source of sepsis within three to six hours (according to clinical urgency) consistent with current national and international guidelines.[4, 17]

Patients with NEWS2 ≤4 with probable infection should have diagnostic tests and a source control plan within six hours which may include prescribing antimicrobials.[20] Antimicrobials should not be withheld in anticipation of development of sepsis. The aim is not to delay treatment, but to allow sufficient time to make an informed clinical judgement.

Table 8. Timeliness of care for emergency admissions with suspected sepsis

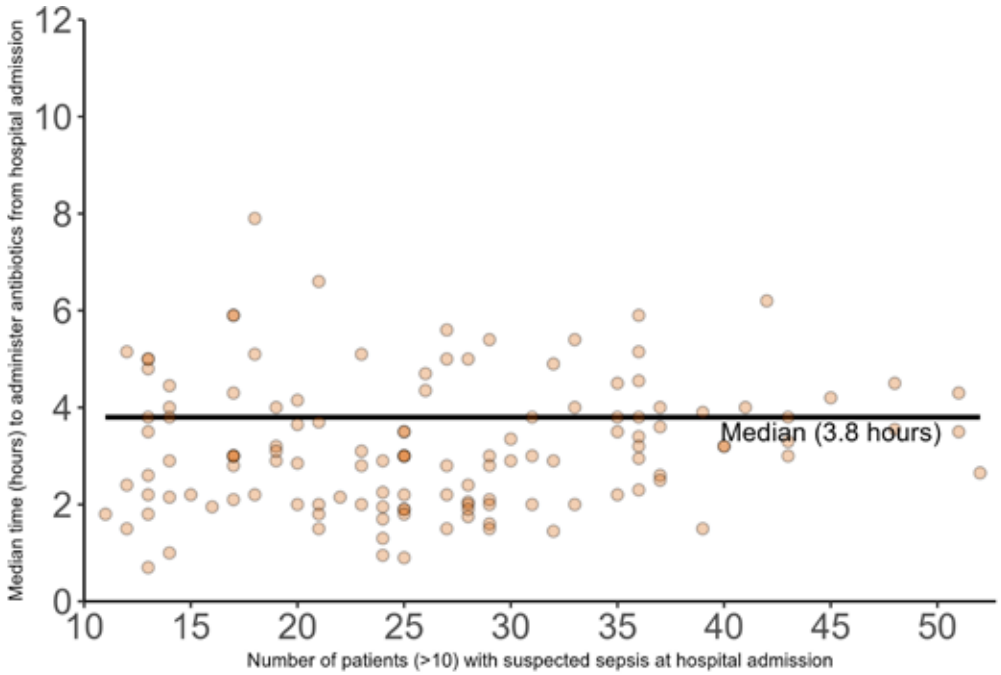
	Number	Median [IQR] time from hospital arrival until first antibiotic administration	Proportion who receive antibiotics within one hour of admission
Suspected sepsis on arrival	4,067	3.0 hours [1.2–6.8 hours]	22.3%
Suspected sepsis at decision to operate	4,902	4.0 hours [1.6–9.0 hours]	18.2%
Predicted gross intra-abdominal contamination with pus or blood around time of decision to operate	3,358	3.8 hours [1.6–8.2 hours]	18.0%

Some of the challenges facing EDs are described in the previous section about door-to-surgery times. EDs are facing both unprecedented demand, and a mismatch between demand and capacity of hospitals, and this is acknowledged. There must be prompt engagement of surgical services with initiation of definitive surgical *and* medical antimicrobial therapies earlier in the patient pathway. The Royal College of Emergency Medicine recommends that all participating hospitals have a NELA ED lead[23] working alongside other clinical leads to agree and develop pathways of care for patients who may require emergency laparotomy. Despite this recommendation, there are only five hospitals

participating in NELA known to have a named NELA ED lead. Clinicians (surgeons, emergency physicians, microbiologists, intensivists, and anaesthetists) as well as hospital management teams should work together to address this shortfall.

Wide variation was seen between hospitals in the timeliness of antibiotic administration amongst patients with sepsis who subsequently required an emergency laparotomy. Figure 1 shows the median time to first antibiotic administration from hospital admission where sepsis was suspected on arrival in hospital. Reasons for delay in antibiotic administration are likely multi-factorial, including unclear clinical presentation and appropriate specialty referral/ senior clinical review, delayed diagnostic testing, complex decision-making, antibiotic stewardship, and delays in both prescribing and administration of antimicrobials due to clinical workload of frontline staff. Administration of antimicrobials as close to time of prescribing as possible is of paramount importance. Lack of continuity of clinical and nursing care throughout the patient's acute surgical pathway may contribute to avoidable delays in administration of antibiotics.

Figure 1. Variation at hospital-level in median time to antibiotic administration



11 Postoperative Admission to Critical Care

■ **1 in 5 high-risk patients were not admitted to critical care directly from theatre**

15.7% of high-risk emergency laparotomy patients were admitted to a normal ward rather than critical care or an enhanced care area at the end of surgery (Table 9). These patients were not low-risk – they had an in-hospital mortality rate of 8.8% vs 0.9% for patients assessed as low-risk (Table 9). High-risk patients, admitted to a ward rather than critical care, but subsequently moved to critical care had a mortality rate of 30.0% (Table 10).

78.3% of high-risk patients were admitted directly to critical care (79.1% after excluding those who died in theatre or were discharged elsewhere on an end-of-life pathway; data not shown), compared to 82.3% in Year 7. Trends of critical care admissions over time are shown in Figure 2, annotated with dates of national COVID-19 lockdowns.

The COVID-19 pandemic affected access to critical care during Year 8.[24] Enhanced care areas were created on non-critical care wards, as outlined in guidance from the Centre for Perioperative Care in October 2020.[25] 11.1% of low-risk and 5.8% of high-risk patients were discharged from theatre to enhanced care areas in a theatre recovery unit or a general ward (8.5% of all patients vs 6.9% in Year 7).

Table 9. In-hospital mortality rates by destination after theatre excluding those who died prior to discharge from theatre complex

	Low-risk patients[1]		High-risk patients[1]	
	Number (%)	Mortality rate (%)	Number (%)	Mortality rate (%)
Ward	6,997 (61.9%)	0.9%	1,702 (15.7%)	8.8%
Critical care	3,048 (27.0%)	2.1%	8,484 (78.3%)	19.6%
Enhanced recovery area within theatres[2]	757 (6.7%)	1.8%	439 (4.1%)	10.9%
Enhanced care on normal ward	494 (4.4%)	1.0%	185 (1.7%)	9.7%
Total	11,296	1.2%	10,810	17.5%

[1] Categorisation of risk using calculations performed at end of surgery, i.e., postoperative risk

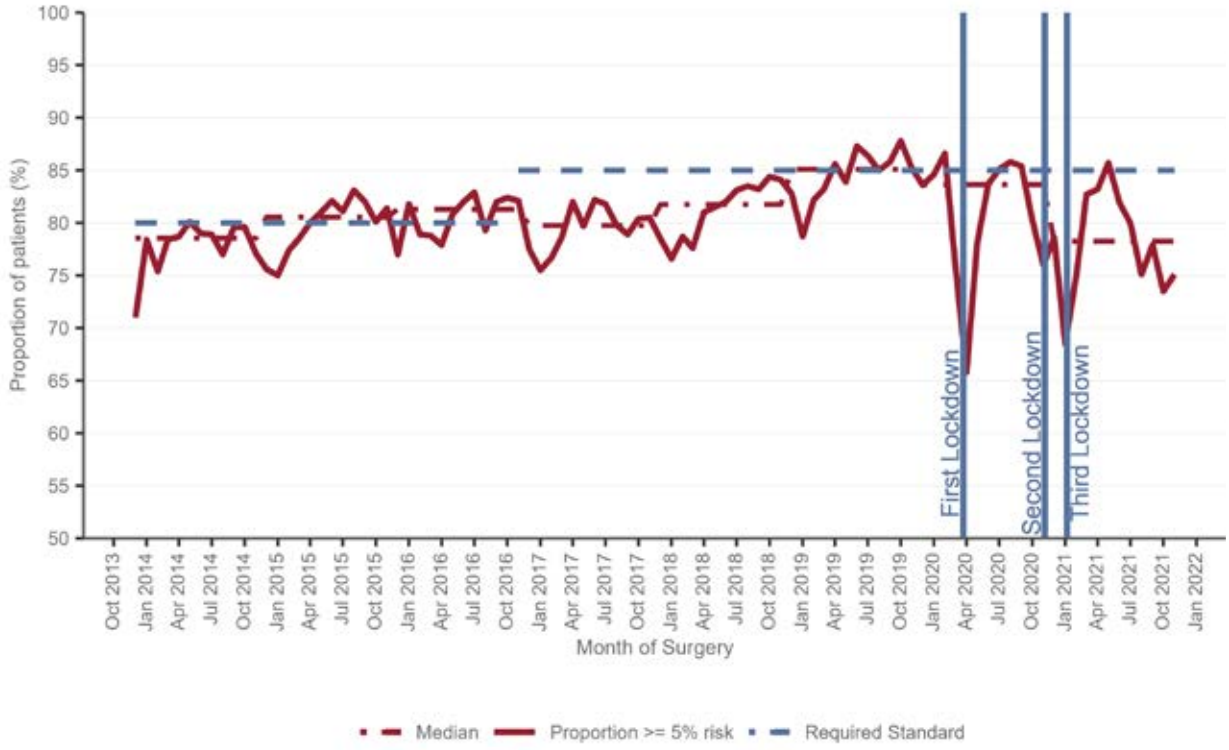
[2] Includes post-anaesthetic care units, overnight enhanced recovery areas and enhanced perioperative care units

Table 10. In-hospital mortality rates by destination after theatre excluding those who died prior to discharge from theatre complex

	Low-risk patients[1]		High-risk patients[1]	
	Number (%)	Mortality rate (%)	Number (%)	Mortality rate (%)
Ward followed by subsequent unplanned critical care admission	132 (1.2%)	12.1%	40 (0.4%)	30.0%
Critical care followed by subsequent unplanned critical care readmission	100 (0.8%)	9.0%	375 (3.5%)	32.0%

[1] Categorisation of risk using calculations performed at end of surgery, i.e., postoperative risk

Figure 2. Proportion of high-risk patients admitted to critical care over time



12 Best Practice Tariff

An enhanced 'Best Practice Tariff' (BPT) has been payable since 2019 to hospitals in England if 80% of high-risk patients (≥5% mortality risk at both preoperative and postoperative risk assessment) have both a consultant surgeon and consultant anaesthetist present in theatre, and are admitted directly to critical care from theatre.

Whilst an enhanced tariff is not payable in Wales, the composite standard of consultant delivered care plus critical care admission for high-risk patients is no less relevant. We have assessed combined NELA data from both England and Wales, and report in Table 11 the proportion that met this composite standard in Year 8, compared to previous years. Risk assessment and consultant delivered care elements of the composite BPT measure have been maintained in Year 8. Hence reduction in the proportion of patients meeting the BPT standard since Year 6 is likely due to reduced critical care capacity during the pandemic.

Table 11. Percentage of patients meeting the composite standard compatible with BPT payments in England (combined data from England and Wales)

	Year 5 (Dec 2017–Nov 2018)	Year 6 (Dec 2018–Nov 2019)	Year 7 (Dec 2019–Nov 2020)	Year 8 (Dec 2020–Nov 2021)
Proportion of patients meeting the BPT standard	70.5%	77.2%	75.6%	73.7%

13 Care of the Older Patient

- **Frailty approximately doubled the risk of mortality following emergency laparotomy**
- **Postoperative geriatrician review was associated with a reduction in mortality**
- **Geriatrician involvement remained the most poorly delivered standard against which NELA audits**

More than half (12,245, 55.3%) of all patients undergoing emergency laparotomy were aged 65 years and older. 6,670 of these older patients (54.5%) were female. **Less than a third (31.8%) of those aged 65 years or older and frail, or aged 80 years and older, had multidisciplinary input including early involvement of geriatrician-led teams.** Amongst all patients aged 65 years and older (both frail and non-frail), geriatrician review was associated with a reduction in in-hospital mortality (Table 12). However, those patients who die early in the postoperative period (and/or in critical care) may never reach geriatrician review. Therefore, timing of geriatrician input in the patient pathway may be a confounding factor. There was an increased postoperative length of stay amongst survivors who underwent geriatrician review, possibly related to intra-hospital transfer to elderly care rehabilitation units. Female patients tended to be more frail than male patients (Table 13).

There has been some improvement in access to specialist services for these most vulnerable of patients – 20 of 173 (11.6%) units rated green in Year 8 RAG tables versus 2 of 192 (1.0%) units in Year 1 – despite a lack of specific funding streams to support service developments. Nevertheless, geriatrician input remains the poorest achieved standard against which NELA audits.

Around a third of all patients undergoing emergency laparotomy are recorded as frail at the time of surgery. Emergency major abdominal surgery can induce frailty during the postoperative period in the pre-frail (Clinical Frailty Scale [CFS] = 4).[26] As such, the proportion of patients who are frail at the time of discharge may be underrepresented in recorded NELA data. Patients who either become frail postoperatively, or who are assessed as frail on postoperative geriatrician review, will not be recorded as such in the NELA dataset where frailty is recorded preoperatively.

NELA questions have been modified annually to pragmatically reflect geriatric team development, changes in workforce, and published guidelines.[27] It is possible the standard will evolve further as the audit continues. Ongoing development and funding of these perioperative medicine teams at healthcare organisation level will be required to achieve this standard of care.

Table 12. Length of stay and mortality by geriatrician review

	Geriatrician review		No geriatrician review	
	Length of postoperative hospital stay median [IQR]	In-hospital mortality	Length of postoperative hospital stay median [IQR]	In-hospital mortality
Aged ≥65 years and non-frail (n=6,460)	13 days [7–22 days] n=1,752	5.9%	9 days [6–15 days] n=3,598	9.5%
Aged ≥65 years and frail (n=4,130)	16 days [10–28 days] n=1,327	13.0%	11 days [8–21 days] n=2,028	22.3%
Aged 65–79 years and non-frail (n=4,931)	12 days [7–23 days] n=1,249	5.0%	9 days [6–15 days] n=2,849	8.2%
Aged 65–79 years and frail (n=2,253)	16 days [9–29 days] n=656	11.9%	11 days [6–20 days] n=1,171	21.9%
Aged ≥80 years and non-frail (n=1,529)	13 days [8–22.5 days] n=503	8.2%	10 days [6–17 days] n=749	14.6%
Aged ≥80 years and frail (n=1,877)	16 days [10–27 days] n=671	14.2%	11 days [6–19 days] n=857	23.1%

Table 13. Frailty score by gender[1]

	CFS 1–4	CFS 5+	CFS not recorded
Male (n=5,575)	3,117 (55.9%)	1,687 (30.3%)	771 (13.8%)
Female (n=6,670)	3,343 (50.1%)	2,443 (36.6%)	884 (13.3%)

[1] Includes patients aged 65 and older

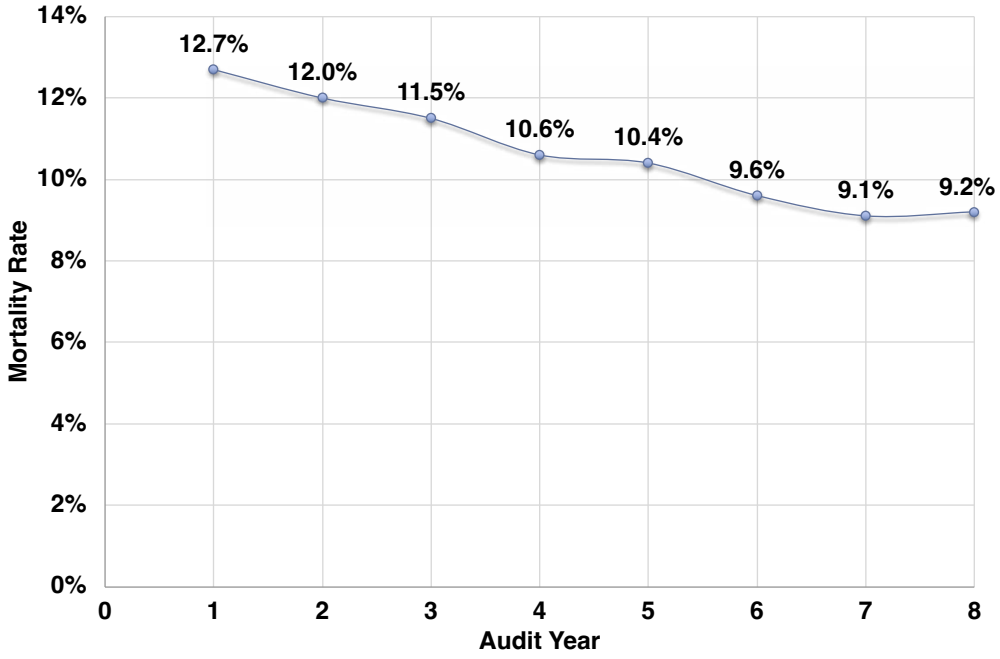
14 Outcomes

Mortality

Risk-adjusted, 30-day mortality data is currently pending and will be published as an update to this report when available. We instead present unadjusted hospital-reported mortality rates, which include any death that occurred in-hospital up to 60 days postoperatively, but does not include any deaths that may have occurred following discharge.

As shown in Figure 3 below, **there has been a steady reduction in in-hospital mortality since NELA's inception, although rates have levelled off in the past two years (9.1% and 9.2% respectively).**

Figure 3. In-hospital mortality over time



Length of Stay

Median length of hospital stay (LOS) for survivors in Year 8 was 10 days (10 days in Year 7) (Figure 4). Patient and surgical factors all influence the rapidity of recovery after emergency laparotomy. Those patients who require a return to theatre or unplanned admission (or readmission) to critical care have a prolonged median LOS of 29 days and 24 days respectively (Table 14), and increased mortality (see Section 11).

Figure 4. Median length of stay by audit year

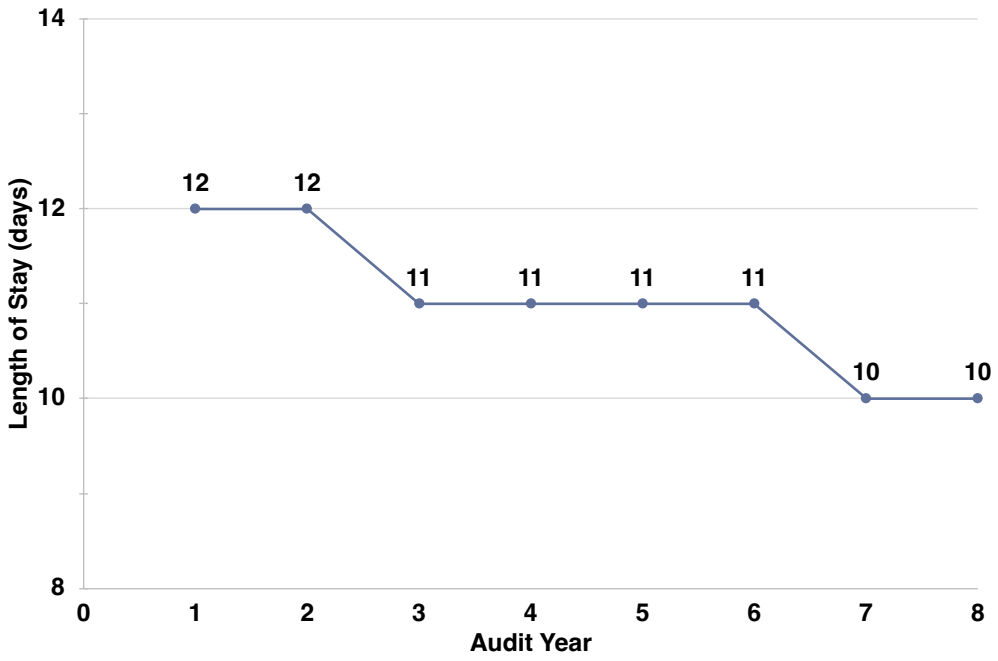


Table 14. Median length of stay by patient characteristics

	Length of Stay (median [IQR])
All patients	10 days [6–18 days]
Age <65	9 days [6–15 days]
Age ≥65	12 days [7–21 days]
Age ≥80	13 days [8–22 days]
American Society of Anesthesiologists (ASA) 3+	13 days [8–24 days]
Postoperative mortality risk ≥5%	15 days [9–26 days]
Unplanned return to theatre	29 days [19–48 days]
Unplanned critical care admission	24 days [15–40 days]

15 Deprivation

Accepted deprivation indices[28–29] have been used to analyse the NELA population by quintiles for both England and Wales (Figures 5–11). In England, a greater proportion of patients were found to live in more deprived areas and they tended to be younger and have lower NELA risk scores than those in less deprived areas. There was no evidence of variation in processes of care between deprivation quintiles for the proportion of patients with a formal risk assessment, and the proportion who meet the BPT composite measure. Mortality appeared higher in the most deprived areas, although this has not been adjusted for risk.

Patients in more deprived areas of Wales also tended to be younger than those in less deprived areas. Mortality rates showed a less consistent pattern across deprivation quintiles in Wales.

Poulton *et al* examined in detail the impact of socioeconomic deprivation on mortality following emergency laparotomy in England.[30] They found increasing deprivation was significantly associated with higher mortality rates, even after controlling for co-morbidity, and despite an absence of evidence of any shortfall in structures of healthcare provision or in the processes of care offered to those admitted to hospitals in more deprived areas. They concluded that neither the hospital-level structures nor the patient-level processes of care studied were sufficient to explain why increasing deprivation was associated with higher mortality rates following emergency laparotomy.

Figure 5. Percentage of patients within each deprivation quintile by nation

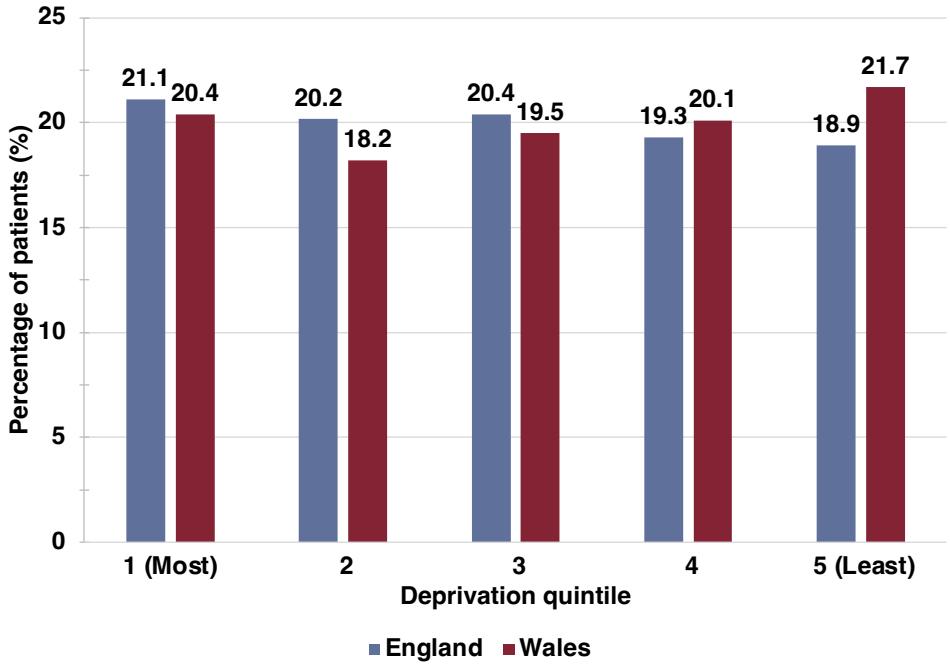


Figure 6. Median age by deprivation quintile and nation

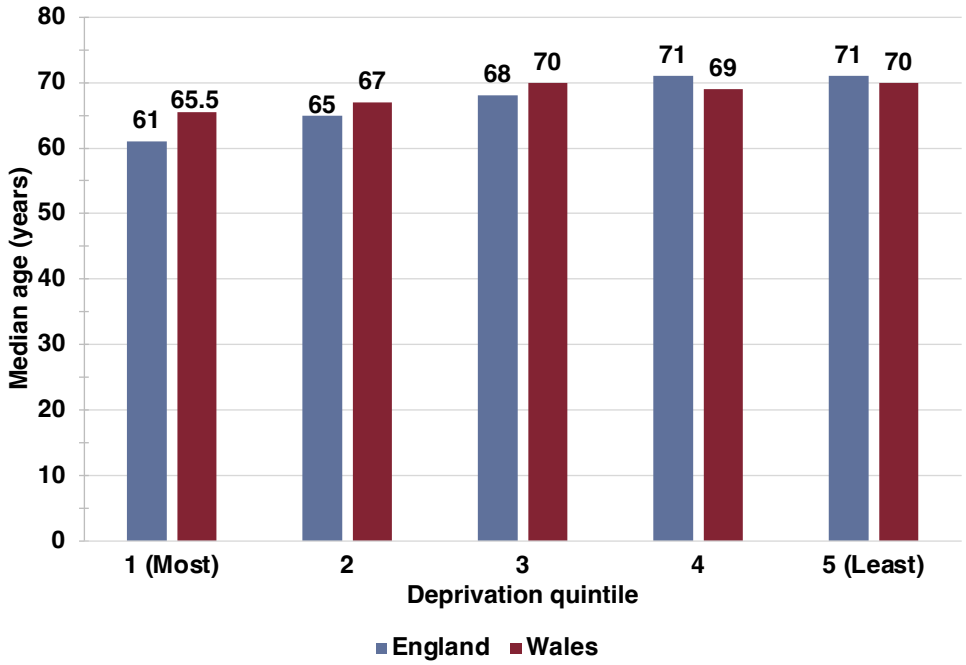


Figure 7. Median NELA risk score by deprivation quintile and nation

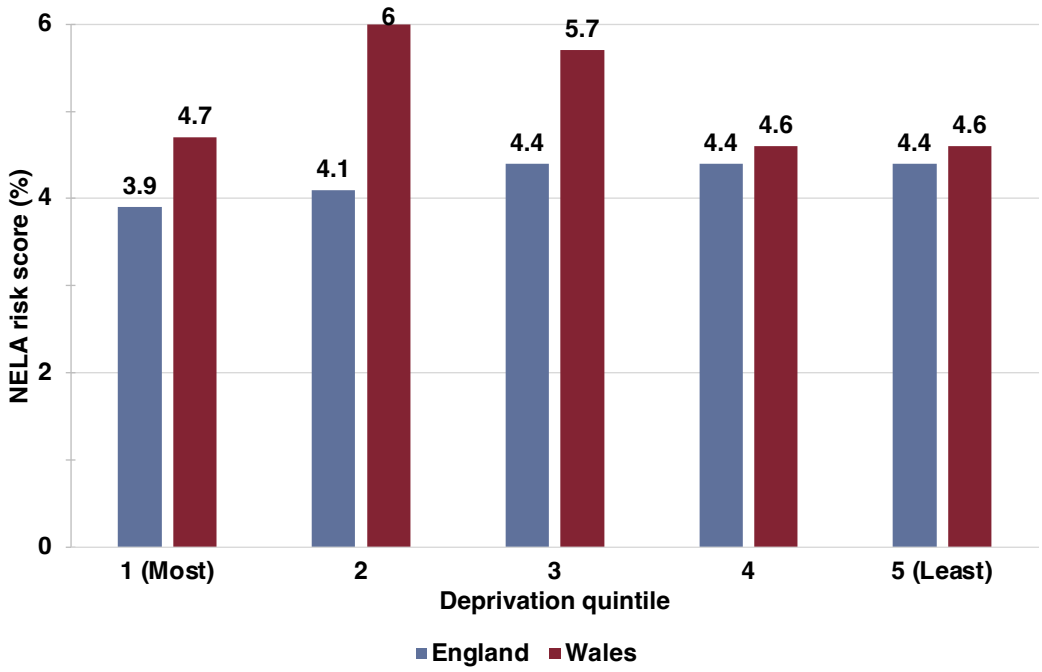


Figure 8. Percentage of patients with risk assessments preoperatively by deprivation quintile and nation

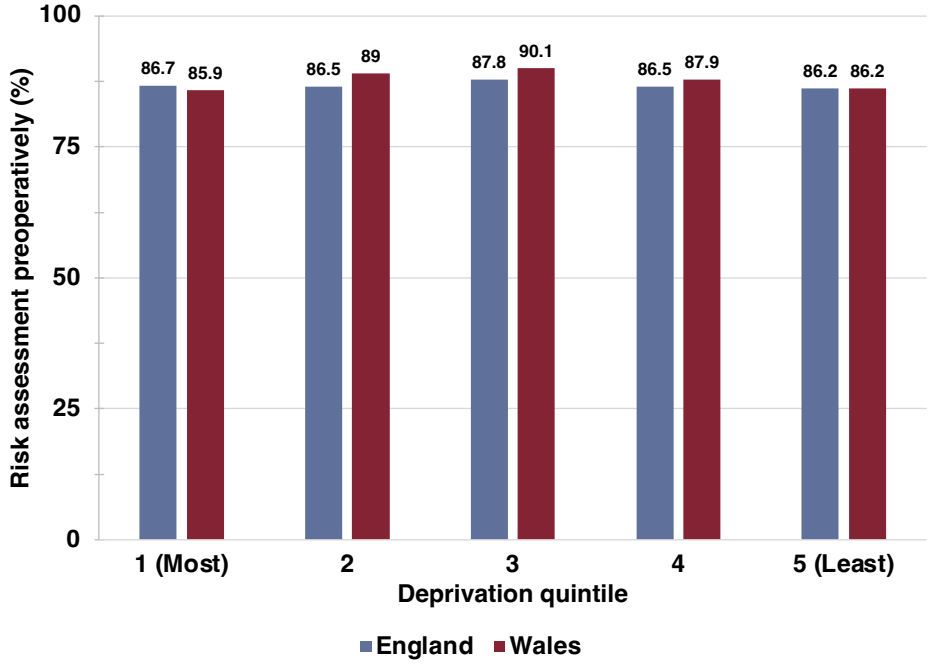


Figure 9. Percentage of patients with composite Best Practice Tariff met by deprivation quintile and nation

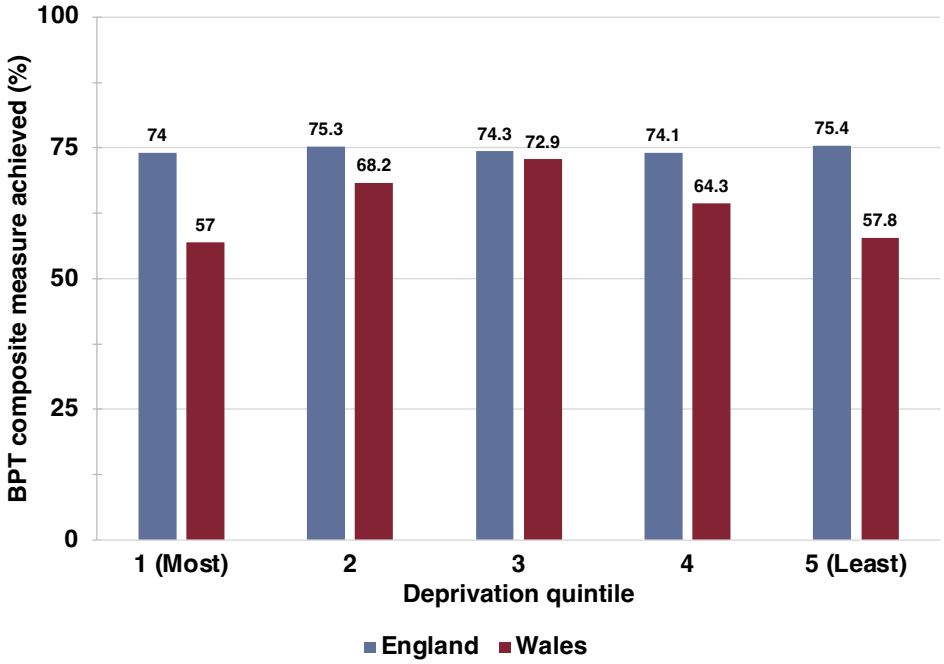


Figure 10. Median postoperative length of stay by deprivation quintile and nation

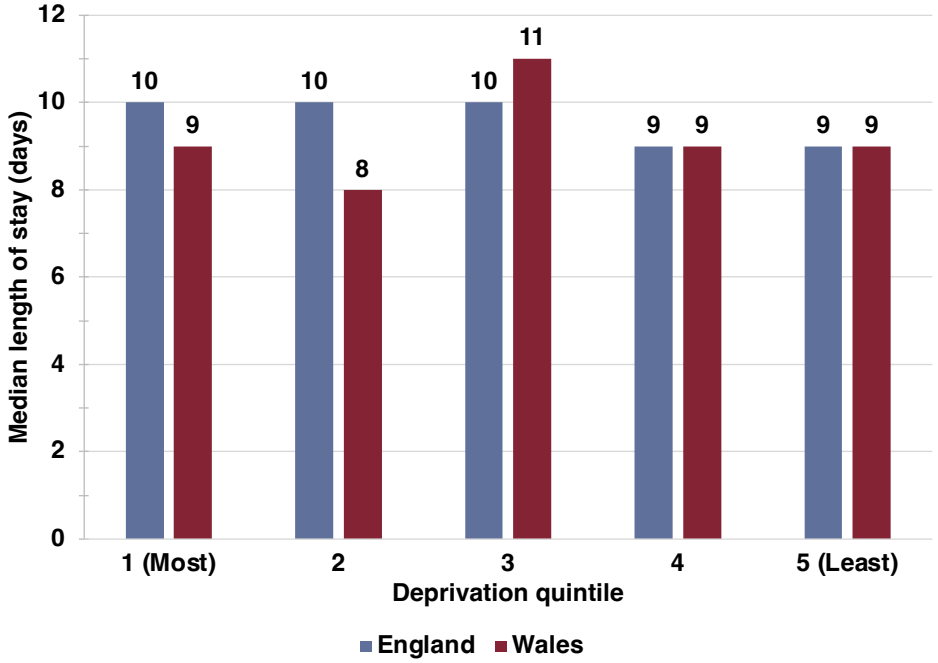
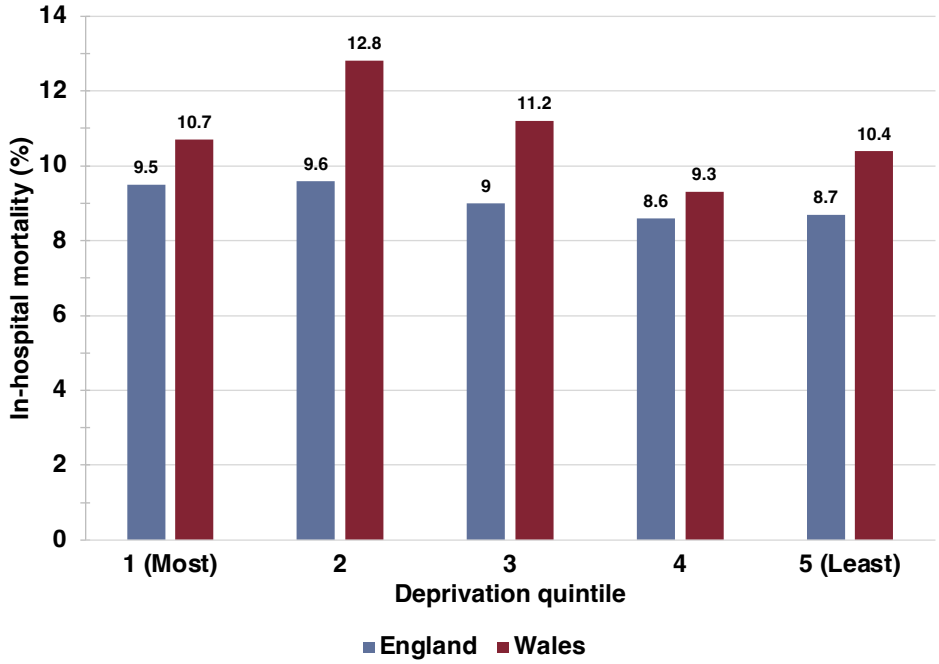


Figure 11. In-hospital mortality by deprivation quintile and nation



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Appendix 1
Membership of the NELA Project Board and Clinical Reference Group

Project Board

- Mr Iain Anderson (Chair), Association of Surgeons of Great Britain and Ireland
- Dr Seema Agarwal, Association of Anaesthetists
- Professor David Cromwell, Royal College of Surgeons of England
- Ms Sharon Drake, Director of Clinical Quality and Research, Royal College of Anaesthetists
- Professor Mike Grocott, Royal College of Anaesthetists
- Dr Carolyn Johnston, NELA Quality Improvement Lead
- Mr Jose Lourtie, Head of Research, Royal College of Anaesthetists
- Ms Carly Melbourne, Associate Director of Clinical Quality and Research, Royal College of Anaesthetists
- Professor Ramani Moonesinghe, NHS England
- Ms Janet Moss, Patient representative
- Dr Dave Murray, NELA Chair
- Ms Lyndsay Pearce, NELA Research and Surgical Lead
- Ms Natalia Plejic, Healthcare Quality Improvement Partnership
- Dr David Saunders, NELA Anaesthetic Lead
- Mr Paul Smith, Healthcare Quality Improvement Partnership
- Ms Christine Taylor, Research Manager/NELA Project Manager, Royal College of Anaesthetists
- Ms Gillian Tierney, Association of Surgeons of Great Britain and Ireland

Clinical Reference Group

- Dr Seema Agarwal, Association of Anaesthetists
- Dr Majd Al Shamaa, Welsh representative
- Professor David Cromwell, Royal College of Surgeons of England
- Ms Sarah Duff, Association of Surgeons of Great Britain and Ireland
- Mr Tim Duncan, British Gynaecological Cancer Society
- Professor David Harrison, Intensive Care National Audit and Research Centre
- Dr Carolyn Johnston, NELA Quality Improvement Lead
- Ms Lindsay Keeley, Association for Perioperative Practice
- Dr Shondipon Laha, Intensive Care Society
- Mr Nicholas Lees, Royal College of Surgeons of England
- Ms Janet Moss, Patient representative
- Dr Dave Murray, NELA Chair
- Dr Babu Muthuswamy, Welsh representative
- Dr Mike Nevin, UK Clinical Directors Network
- Ms Lyndsay Pearce, NELA Research and Surgical Lead
- Dr Anne Pullyblank, Academic Health Services Network
- Dr David Saunders, NELA Anaesthetic Lead
- Dr Tanuja Shah, Age Anaesthesia Association
- Dr Peter Shirley, Faculty of Intensive Care Medicine
- Ms Anna Tennant, Royal College of Nursing
- Dr Simon Varley, Emergency Laparotomy Network
- Dr Arturo Vilches-Moraga, British Geriatrics Society
- Dr Sally-Anne Wilson, Royal College of Emergency Medicine

Appendix 2
Glossary and Abbreviations

Abdomen/Abdominal
Anatomical area between chest and pelvis, which contains numerous organs, including the bowel

Adhesiolysis
Surgical procedure to remove intra-abdominal adhesions that often cause bowel obstruction

ASA
American Society of Anesthesiologists Physical Status score (ASA-PS)

Bowel
Part of the continuous tube starting at the mouth and finishing at the anus. It includes the stomach, small intestine, large intestine and rectum

BP
Blood pressure

BPT
Best Practice Tariff

CFS
Clinical Frailty Scale

Colon/Colonic
Part of the large intestine

COVID-19
Coronavirus disease caused by SARSCoV-2

CT
Computed tomography – a very advanced form of X-ray used in diagnosis and treatment

ED
Emergency Department

Elective
In this report, refers to both the mode of hospital admission and to urgency of surgery. The timing of elective care can usually be planned to suit both patient and hospital (can be weeks to months). In contrast, urgent/emergency care usually has to take place within very short timescales (hours)

Enhanced perioperative care
A model of care for surgical patients who cannot be optimally cared for in a general ward environment. It provides a pathway for patients with monitoring, treatment or care needs which are greater than those provided on normal postoperative wards, but who are not expected to require Level 2 or 3 (Critical Care) interventions or staffing to meet their care needs

Emergency laparotomy
Opening of the abdomen to undertake emergency bowel surgery that, due to underlying conditions, must be carried out without undue delay

Geriatrician
A clinician specialising in care of older patients

Hartmann's Procedure
Surgical procedure to remove part of the large bowel resulting in the formation of an end colostomy, and leaving part of the rectum in-situ

HES
Hospital Episode Statistics

High-risk
All patients are assumed to be high risk, unless the NELA risk score is less than 5% AND the patient was considered to be low risk according to clinical judgement (where documented). Therefore, either a NELA risk score of ≥5% or clinical judgement that a patient is high risk will put a patient into the high-risk category. Where the NELA risk model is incomplete and cannot be calculated, the patient will be assumed to be high risk

HQIP
Healthcare Quality Improvement Partnership

Intestine/Intestinal
Part of the bowel

Intra-abdominal
Inside the abdomen/tummy

IQR
Interquartile range – the middle 50% of observations either side of the median

Ischaemia
Loss of, or insufficient blood supply to an affected area or organ

Key Finding
Significant result from the analysis

Key Process Measure
The metric by which NELA computes compliance with Key Standards

Key Standard
Guideline which NELA audits care against

Laparoscopic
Keyhole surgery

Laparotomy
A surgical incision (cut) into the abdominal cavity

LOS
Length of Stay

Median
Midpoint of all observations when ranked in order from smallest to largest

NCEPOD
National Confidential Enquiry into Patient Outcome and Deaths

NELA
National Emergency Laparotomy Audit

NEWS2
National Early Warning Score

Obstruction
Blockage of the bowel. It can be caused by a variety of conditions and can cause the bowel to burst (perforate). It has the potential to make people very unwell and can be life threatening

PEDW
Patient Episode Database of Wales

Perforation
One or more holes in the wall of the bowel. It can be caused by a variety of conditions. It has the potential to make people very unwell very quickly and can be life threatening

Perioperative
Around the time of surgery (incorporating preoperative, intraoperative and postoperative)

Peritonitis
Infection or inflammation within the abdomen, causing severe pain. It has the potential to make people very unwell very quickly and can be life threatening

Postoperative
After surgery

Preoperative
Before surgery

RAG
Red, Amber, Green

RCoA
Royal College of Anaesthetists

Stoma
A small opening on the surface of the abdomen created to divert fluid/faeces to the outside of the body

National Emergency Laparotomy Audit (NELA)

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