

# National Emergency Laparotomy Audit (NELA) In A District General Hospital, Northern Ireland

## Abstract

Emergency laparotomy Audit is the facility that helps to take care of patients in their adverse conditions with the help of advanced medical facilities and tried to cure them every aspect.

**Aim:** We measured our patient outcomes regarding 30-day mortality rate and morbidity post emergency laparotomies performed in Daisyhill Hospital, Newry and compared it to NELA (National Emergency Laparotomy Audit). This is to identify the reasons in our DGH (Daisyhill Hospital) for the better or worse outcome performance to improve patient care.

**Methods:** This audit is carried out over a two years duration from August 2015 to August 2017. Data were collected from the theatre log, surgeons log, secretarial operation notes log and Northern Ireland Electronic Care Record. Inclusion and exclusion criteria of patients were met as set out by NELA.

**Results:** Total number of patients included in the audit is 112. Out of 112, 53 patients are female, and 59 are male. The median age is 65.5-year-old with a range from 19 to 87 years old. The 30-day mortality rate is 7.1% (n=8) which is 1.5 times lower than the national 30-day mortality rate. 90-day mortality rate is 0.9% (n=1).

**Conclusion:** Our unit is performing well compared to NELA patient outcomes regarding 30-day mortality rate post emergency laparotomy. We would recommend detailed data collection including the time of day of operation, ASA (American Society of Anesthesiologist) grading and p-possum score.

**Keywords:** laparotomies, ASA grading, secretarial operation, mortality rate, p-possum score

## Introduction

NELA measures and reports patient outcomes for the quality of care received by patients undergoing emergency laparotomy and compares these against standards of care such as those detailed in recent (National Confidential Enquiry into Patient Outcome and Death ) NCEPOD reports and Department of Health, Royal College of Surgeon England's "Higher Risk General Surgical Patient (2011)"<sup>1,2,3</sup>. NELA is a national clinical audit commissioned by the Health Quality Improvement Partnership (HQIP) and the Patient Outcomes Programme (NCAPOP)<sup>1</sup>. Our hospital is a district general hospital with limited resources where we have no intensive care unit facility and lacking healthcare staffs. However, we do have a significant number of emergency laparotomy performed over the years while meeting the standards of care set out by the Department of Health. There is unlikely to be one 'best way' of organising the delivery of care. Each hospital will need to organise services according to the needs and pressures faced where different issues will exist in each hospital. To find our

38 solution, NELA audit is carried out to provide tools and data to empower our local team to  
39 develop the most effective solution in our environment.

#### 40 **Aims**

41 We compare against NELA standards of care to better define what interventions are effective  
42 in emergency laparotomy care. Our audit also reports patients' outcomes regarding mortality  
43 and morbidity post emergency laparotomies performed in Daisyhill Hospital, a district  
44 general hospital aimed at improving the delivery of care to this high-risk group of patients.

#### 45 **Audit Standards**

46 At present, hospitals are considered to have provided excellent quality care (rated Green) if a  
47 standard has been met for more than 80% of patients. In this audit, 9 key standards set out by  
48 NCEPOD and Department of Health are subject to RAG-rating including (i) CT scan  
49 reported before surgery, (ii) risk of death documented preoperatively, (iii) arrival in theatre  
50 within a timescale appropriate to urgency, (iv) preoperative review by a consultant surgeon  
51 and a consultant anaesthetist when P-POSSUM risk of death  $\geq 5\%$ , (v) consultant surgeon and  
52 consultant anaesthetist both present in theatre when P-POSSUM risk of death  $\geq 5\%$ , (vi)  
53 consultant neurosurgeon only present in theatre when P-POSSUM risk of death  $\geq 5\%$ , (vii)  
54 consultant anaesthetist only present in theatre when P-POSSUM risk of death  $\geq 5\%$ , (viii)  
55 admission directly to critical care after surgery when P-POSSUM risk of death  $> 10\%$ , and  
56 (ix) assessment has done by taking care of the older person with the increasing age of 70  
57 years<sup>4,5</sup>

#### 58 **Methods**

59 A retrospective data collection was performed involving patients undergoing emergency  
60 laparotomy over the past two years from August 2015 to August 2017. Data was collected  
61 from the theatre log, the surgeon log, the secretarial operation notes log and the Northern  
62 Ireland Electronic Care Record. NELA's criteria guided our data inclusion and exclusion  
63 criteria. In this audit, data were collected on patient demographics, surgeon volume,  
64 morbidity, 30-day mortality and length of hospital stay.

65 Inclusion criteria as per NELA<sup>1</sup>:

- 66 • “Age  $\geq 18$
- 67 • Expedited, urgent or emergency (NCEPOD definitions) abdominal procedure on GI  
68 tract
- 69 • Open, laparoscopic or laparoscopic-assisted stomach, small or large bowel, or rectum  
70 for conditions such as perforation, ischaemia, abdominal abscess, bleeding or  
71 obstruction
- 72 • Washout/evacuation of the intra-peritoneal abscess (unless due to appendicitis or  
73 cholecystitis – excluded)
- 74 • Washout/evacuation of the intra-peritoneal haematoma

- 75 • Bowel resection/repair due to incarcerated incisional, umbilical, inguinal and femoral
- 76 hernias (but not hernia repair without bowel resection/repair). E.g., Large incisional
- 77 hernia repair with bowel resection
- 78 • Bowel resection/repair due to obstructing/incarcerated incisional hernias provided the
- 79 presentation and findings were acute. This will include large incisional hernia repair
- 80 with the division of adhesions.
- 81 • Laparotomy/laparoscopy with inoperable pathology (e.g. peritoneal/hepatic
- 82 metastases) where the intention was to perform a definitive procedure. This does not
- 83 include purely diagnostic procedures.
- 84 • Laparoscopic/Open Adhesiolysis
- 85 • Return to the theatre for the repair of substantial dehiscence of the significant
- 86 abdominal wound (i.e. "burst abdomen")
- 87 • Any reoperation/return to theatre for complications of elective general/upper GI
- 88 surgery meeting the criteria above was included. Returns to the theatre for
- 89 complications following non-GI surgery are now excluded (see exclusion criteria
- 90 below)."

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92 Exclusion criteria as per NELA<sup>1</sup>:

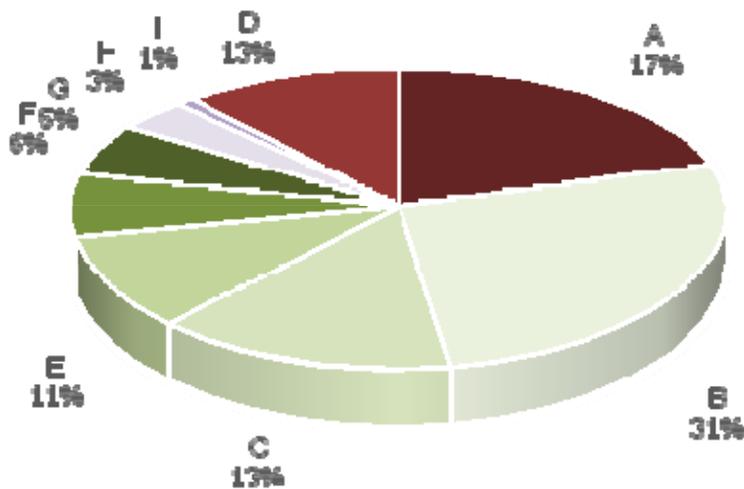
- 93 • "Patients under 18
- 94 • Elective laparotomy / laparoscopy
- 95 • Diagnostic laparotomy/laparoscopy where no subsequent procedure was performed
- 96 • Appendicectomy +/- drainage of localised collection unless the procedure is incidental
- 97 to a non-elective procedure on the GI tract
- 98 • Cholecystectomy +/- drainage of localised collection unless the procedure is
- 99 incidental to a non-elective procedure on the GI tract (All surgery involving the
- 100 appendix or gallbladder, including any surgery relating to complications such as
- 101 abscess or bile leak was excluded.
- 102 • Non-elective hernia repair without bowel resection or division of adhesions
- 103 • Minor abdominal wound dehiscence unless this causes bowel complications requiring
- 104 resection
- 105 • Non-elective formation of a colostomy or ileostomy as either a trephine or a
- 106 laparoscopic procedure (NB: if a midline laparotomy was performed, with the primary
- 107 procedure being the formation of a stoma then this should be included)
- 108 • Vascular surgery, including abdominal aortic aneurysm repair
- 109 • Caesarean section or obstetric laparotomies
- 110 • Gynaecological laparotomy
- 111 • Ruptured ectopic pregnancy, or pelvic abscesses due to pelvic inflammatory disease
- 112 • Laparotomy/laparoscopy for pathology caused by blunt or penetrating trauma
- 113 • All surgery relating to organ transplantation (including returns to theatre for any
- 114 reason following transplant surgery)
- 115 • Operation about sclerosing peritonitis

- 116 • Surgery for removal of dialysis catheters
- 117 • Laparotomy/laparoscopy for oesophageal pathology
- 118 • Laparotomy/laparoscopy for the pathology of the spleen, renal tract, kidneys, liver,
- 119 gallbladder and biliary tree, pancreas or urinary tract
- 120 • Returns to the theatre for complications (e.g. bowel injury, haematoma, collection)
- 121 following non-GI surgery were excluded."

122 **Results**

123 A total number of emergency laparotomy performed in our unit over the last two years which  
 124 met the NELA criteria is 112 patients. Out of 112 patients, 53 of them are female, and 59 are  
 125 male. The mean age of the patients is 59.9 years old, and the median age is 62-year-old (age  
 126 ranging from 19 to 87 years old). Percentage of patients above 70 years old is 36.6% (i.e.,  
 127 41/112). The average length of hospital stay is 14.5 days (ranging from 1 to 77 days). Our  
 128 hospital unadjusted 30-day mortality rate is 7.1% (i.e., eight mortality out of 112 patients  
 129 resulting within 95% standard deviation of the national data) which is 1.5 times lower than  
 130 the national 30-day mortality rate of 10.6%. Our 90-day mortality rate is 0.8% (i.e. 1/112).  
 131 The individual consultant caseloads of emergency laparotomy over the two years audit are  
 132 (A) 19, (B) 35, (C) 15, (D) 14, (E) 13, (F) 7, (G) 6, (H) 4, and (I) 1.

133 Figure 1: Pie chart depicting the percentage of individual consultant caseloads



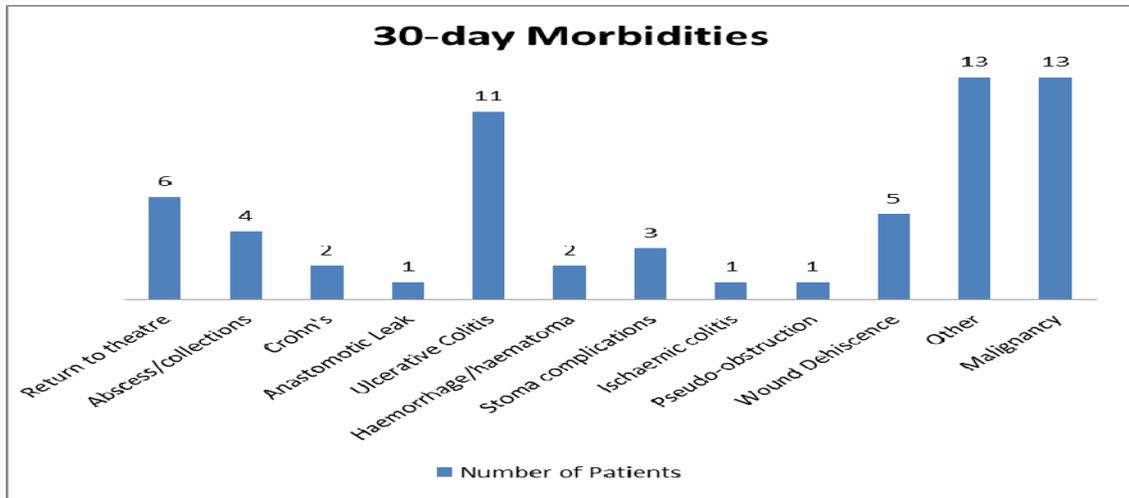
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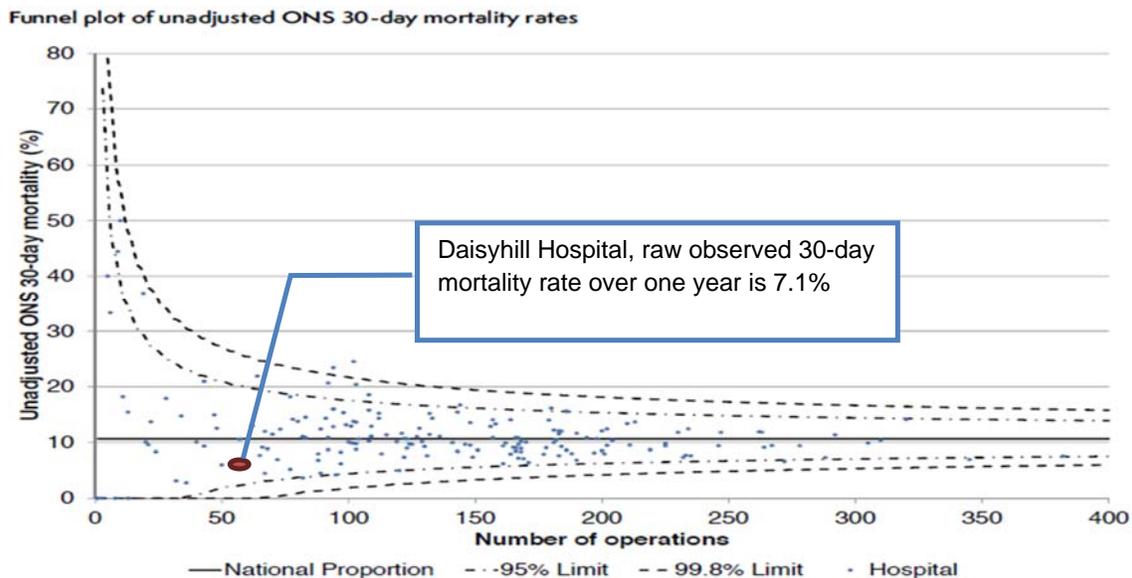
138 Figure 2: a Bar graph showing 30-day post-operative morbidities.



139

140 **36 out of 62 patients, who developed the complications 30 days post emergency**  
 141 **laparotomy as demonstrated on the bar graph above are aged above 70 years old. The**  
 142 **incidence of 30-day morbidity in our hospital is 62 cases (i.e. 55%). This is higher than**  
 143 **the national 30-day morbidity rate which is 50%.<sup>11</sup> In comparison to NELA's fourth**  
 144 **report data, our unit has a lower return to theatre rate of 5.4%(6/112) compared to 6%.**  
 145 **All the patients who had to return to the theatre were aged above 70 years old. 5 out of**  
 146 **8 patients of the 30-day mortality numbers included in this hospital were aged above 70**  
 147 **years old.**

148 **Figure 3: Funnel plot comparing our hospital unadjusted 30-day mortality rate to**  
 149 **national data<sup>1</sup>.**



150

151 **Discussion**

152 Results are a good reflection of the unit's performance level against the national standards  
 153 despite Daisyhill Hospital being a district general hospital with no intensive care unit on site.

154 We reduced biases of under-reporting morbidities and mortality via data collection  
155 undertaken by five clinicians not related to the operations that were carried out. To reduce the  
156 probability of missing data, we collected adequate operative information from theatre log and  
157 surgeon's logbook. Advancing age is associated with worse outcomes after emergency  
158 laparotomy.<sup>6</sup> The physical presence of a consultant surgeon and anaesthetist in the theatre is  
159 vital. To improve post-operative recovery and shorter hospital stay for our high-risk surgical  
160 group patients as recommended by NELA standards, we transfer our patients to local high  
161 dependency unit or intensive care unit in another hospital for initial care post-surgery.<sup>7,8,9,10</sup>

162 We recognised that our sample size is small which may then affect the significance of our  
163 results. This is due to limited data collection as a consequence of time constraint. Hence, we  
164 would recommend calculation of adjusted 30-day mortality rate and include other data  
165 detailed in NELA. These are inclusive of the time to the theatre, time of the day for operation,  
166 p-possum score, ASA grading, anaesthetic time, consultant anaesthetist and surgeon presence  
167 in theatre which could be gathered prospectively from the theatre management system and  
168 patient medical notes from medical records.

## 169 **Conclusions**

170 Our patients had more minor complications, but survival is significantly better in our  
171 department compared to the national 30-day mortality rate.

## 172 **Recommendations**

173 We would recommend the introduction of an Urgent Bookable list (i.e. NCEPOD for urgent  
174 or expedited cases) to improve efficacy in organizing services according to the needs and  
175 pressures faced in district general hospital.

## 176 **COMPETING INTERESTS DISCLAIMER:**

177 Authors have declared that no competing interests exist. The purpose of this research is  
178 commonly and predominantly use for research and country. There is absolutely no conflict of  
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181

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