P124

Process measures in the emergency surgical service: which factors are most relevant to improving survival?

C Wong, M Eid, A Boalot, S Abdelbar, M Mohammed, S Basu, AK Saha, BM Dobbins

***Department of General Surgery**, Huddersfield Royal Infirmary, United Kingdom*

INTRODUCTION

- The National Emergency Laparotomy Audit (NELA) started in 2012
- The audit aimed to improve outcomes after emergency laparotomy by measuring a wide range of process measures
- The study group hypothesized that improving performance in these process measures would, in turn, improve outcomes and mortality after surgery
- All process measures are classified using a 'RAG' rating, with 'Green' awarded to those processes which are successfully met >80% of the time (Figure)

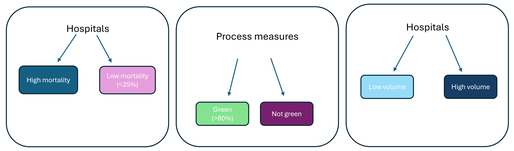
Consultant surgeon present in theatre when risk of death*** >=5% (Year 8)	Consultant surgeon present in theatre when risk of death*** >=5% (Year 9)	Cases included in denominator	Data completene	Change from Ye	Consultant anaesthetist present in theatre when risk of death*** >=5% (Year 8)	Consultant anaesthetist present in theatre when risk of death*** >=5% (Year 9)	Cases included in denominator	Data completene	Change from Ye	Admitted to critical care post op when risk of death***>=5% (Year 8)	Admitted to critical care post op when risk of death***>=5% (Year 9)	Cases included in denominator	Data completene
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	100.0	74	100.0	▲ 0.0	82.4	89.2	74	100.0	▲ 6.8	88.2	82.2	73	100.0
98.1	96.2	53	100.0	▼ -1.9	98.1	96.2	53	100.0	▼ -1.9	61.8	72.5	51	98.1
97.1	94.1	85	100.0	▼ -3.0	91.4	95.3	85	100.0	▲ 3.9	82.8	79.8	84	100.0
100	100.0	153	100.0	▲ 0.0	99.3	100.0	153	100.0	▲ 0.8	73.9	83.8	159	100.0
96.2	97.0	135	100.0	▲ 0.8	86.9	88.9	135	100.0	▲ 2.0	83.3	84.3	127	100.0
97.8	100.0	143	100.0	▲ 2.2	98.7	96.4	143	100.0	▼ -2.3	70.1	87.7	133	100.0
96.7	<10	<10	<10	<10	76.9	<10	<10	<10	<10	47.1	<10	<10	<10
98.1	98.2	164	100.0	▼ -0.1	94.5	93.9	164	100.0	▼ -0.6	35.4	37.1	162	100.0
100	100.0	77	100.0	▲ 0.0	94.5	92.2	77	100.0	▼ -2.3	60.7	75.3	77	98.7
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
96.8	79.2	125	100.0	▼ -17.6	95.2	89.6	125	100.0	▼ -5.6	73.3	72.8	125	100.0
95.7	95.5	89	100.0	▼ -0.2	100	97.8	89	100.0	▼ -2.2	74.5	87.2	94	100.0
100	100.0	34	100.0	▲ 0.0	91.7	91.2	34	100.0	▼ -0.5	63.6	70.6	34	100.0
97.9	97.9	95	100.0	▼ -0.0	96.8	97.9	95	100.0	▼ 0.2	58	78.8	95	100.0
97.6	**97.4**	**721**	**100.0**		**95.4**	**97.6**	**721**	**100.0**		**87.2**	**91.4**	**725**	**100.0**
96.2	91.9	74	100.0	▼ -4.3	94.3	94.6	74	100.0	▲ 0.3	95.7	62.2	77	100.0
<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
95.6	97.7	215	100.0	▲ 2.1	96.7	97.7	215	100.0	▲ 1.0	84	69.3	217	100.0
100	96.1	153	100.0	▼ -3.9	99	94.8	153	100.0	▲ 5.8	77.8	85.1	148	100.0
98.7	96.8	124	100.0	▼ -1.9	88.6	94.4	124	100.0	▲ 5.8	82.4	83.3	126	100.0
98	96.9	127	100.0	▼ -1.1	98	98.4	127	100.0	▲ 0.4	87.5	90.9	136	100.0
100	100.0	23	100.0	▲ 0.0	100	100.0	23	100.0	▲ 0.0	92	96.2	26	100.0
93.2	**94.3**	**1471**	**100.0**		**91.1**	**89.1**	**1471**	**100.0**		**74.3**	**77.0**	**1419**	**100.0**

AIMS

- Though NELA Reports describe hospital-level performance, there have not been any conclusions on which factors are important to reduce mortality
- No NELA report has provided an independent analysis of which process measures are associated with improved outcome or whether success in achieving these process measures makes any difference to mortality
- This study aimed to analyse NELA summary data to determine which process measures might contribute to better outcomes and assess which factors are common to low mortality hospitals.

METHODS

- The Year 8 NELA data table was downloaded and interrogated.
- For each process measure, hospitals were grouped into Red or Amber/Green
- Hospitals were further grouped into low mortality (lower than the national average) and high mortality units



- Chi-squared tests were performed to see which process measures were associated with low mortality hospitals

RESULTS

- There were 21,710 cases. Adjusted mortality was 9.03% (range, 2.5 – 18.4%)
- There was wide variability in success in achieving various process measures (Table)

	Number of Hospitals in Each RAG rating Group (n=164 hospitals)		
Process Measure	**RED**	**AMBER**	**GREEN**
Case ascertainment	25	54	85
Arrival in theatre in appropriate timescale	20	123	21
Admitted to ICU if risk of death <5%	13	91	60
Admitted to ICU if risk of death <10%	12	60	92

RESULTS (*continued*)

- The proportion of patients who had an unplanned return to theatre varied from 0% to 17.2% (median, 4.9%).
- The only process measure with any association with low mortality was an unplanned return to theatre (P=0.009%). Hospitals with low case ascertainment were also associated with low mortality
- Considerable variation between years for individual units (in terms of success in achieving process measures and in outcome)
- General trend in reducing mortality has plateaued in most recent reports

CONCLUSIONS

- Though NELA has been successful in reporting mortality statistics and process measures, it has not (to date) provided any guidance or certainty about which of these process measures make any difference to outcome
- The summary data in this study suggest **unplanned return to theatre is the only factor associated with low mortality** and hospitals should focus resource on high quality primary surgery
- The NELA data offer an unparalleled opportunity to produce meaningful findings to help improve outcomes and future reports should aim to offer specific management recommendations and algorithms based on knowledge of which process measures are proven to improve mortality
- NELA database could be used to explore multivariate analyses of various process measures and assess the strength of any volume0outcome relationship for specific operations

NHS Calderdale and Huddersfield NHS Foundation Trust





SAGES