Emergency Laparotomy Collaborative.  
*Saving 1000 lives together. Collaboration across boundaries* 

Nial Quiney  
Royal Surrey County Hospital  
Guildford 

Scaling Up Improvement
Emergency Laparotomy Collaborative Care Bundle

1. Carry out EWS/Lactate. Ensure resuscitation starts where indicated. Escalate depending on EWS/lactate.
2. Screen for sepsis using screen tool. Start Sepsis 6 and ensure antibiotics given within 1 hour.
3. Ensure patients arrive in operating theatre within 6 hrs (Cat 1 and 2A).
4. Start goal directed fluid resuscitation using dynamic cardiovascular indices.
5. Ensure all patients go to critical care.
1. Carry out EWS/Lactate. Ensure resuscitation starts where indicated. Escalate depending on EWS/lactate

NELA lactate measurement Q 3.5
Both prompt a response with fluid resuscitation/oxygen/SIRS/sepsis
Recommended by ELPQuiC, PPU and EPOCH
Most/All hospitals will already have EWS/lactate based escalation protocol
Recommended by NICE 50 guideline
P-POSSUM mortality estimate does not have significant response pathway
Acutely ill patients in hospital
Implementing NICE guidance

July 2007
Pre-op Blood Lactate

Lactate / % cases

Hospitals

Hospital 13
Hospital 29
Hospital 10
Hospital 27
Hospital 15
Hospital 20
Hospital 11
Hospital 26
Hospital 28
Hospital 25
Hospital 5

Average for all
2. Screen for sepsis using screen tool. Start Sepsis 6 and ensure antibiotics given within 1 hour.

Poorly identified in NELA
Recommended in EPOCH, ELPQuiC and PPU study
May need spot audits and local collaboration
New sepsis definitions 16.2.16
January collaborative meeting will strongly focus on sepsis
Source Control/Antimicrobial Interaction and Survival in Septic Shock

<table>
<thead>
<tr>
<th>Source Control Initiation Post-Shock</th>
<th>Antimicrobial Initiation Post-Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 6 h</td>
<td>&lt; 3 h: 92% (n=75)</td>
</tr>
<tr>
<td>6-24 h</td>
<td>80.0% (n=60)</td>
</tr>
<tr>
<td>&gt; 24 h</td>
<td>69.0% (n=29)</td>
</tr>
</tbody>
</table>

Emergency laparotomy in octogenarians: A 5-year study of morbidity and mortality.

100 pts >80 yrs old
70% had post operative complications
Overall mortality 45%
Leading causes of death:
  Sepsis 42%
  Underlying malignancy 29%
  Myocardial and intestinal ischaemia
  Dementia

Green et al. World J Gastrointest Surg 2013
July 27; 5(7): 216-221
Postoperative morbidity survey, mortality and length of stay following emergency laparotomy*


Anaesthesia
Volume 70, Issue 9, pages 1020-1027, 15 APR 2015
Screen for sepsis using screen tool. Start Sepsis 6 and ensure antibiotics given within 1 hour.

- Prompt administration of antibiotics in patients admitted with peritonitis
  - Many patients at high risk of sepsis did not receive timely antibiotic therapy.
  - For patients who were admitted as an emergency with peritonitis and had surgery within 24 hours.
    - Almost half waited more than four hours for their first dose of antibiotics.
    - A quarter waited more than seven hours.
Screen for sepsis using screen tool. Start Sepsis 6 and ensure antibiotics given within 1 hour.

• RECOMMENDATIONS
  ▪ Multidisciplinary Teams should review their pathways of care for the administration of antibiotics in order to identify why delays occur (Multidisciplinary Teams).
  ▪ Any areas of the hospital that admit emergency general surgical patients need to have robust mechanisms in place to identify patients with signs of sepsis and ensure prompt prescription and administration of antibiotics (Medical Director, Clinical Director, Multidisciplinary Teams).
  ▪ Clinicians should regularly review audit data on timing of administration of antibiotics and time to theatre in order to ensure that aims are being achieved (Multidisciplinary Teams).
Pre-op antibiotics

Proportion of patients

<table>
<thead>
<tr>
<th>Site</th>
<th>Baseline</th>
<th>ELPQuiC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>49.0%</td>
<td>53.2%</td>
</tr>
<tr>
<td>Site 2</td>
<td>47.9%</td>
<td>69.4%</td>
</tr>
<tr>
<td>Site 3</td>
<td>75.0%</td>
<td>64.9%</td>
</tr>
<tr>
<td>Site 4</td>
<td>48.6%</td>
<td>85.7%</td>
</tr>
</tbody>
</table>
Screen for sepsis using screen tool. Start Sepsis 6 and ensure antibiotics given within 1 hour.

NELA probably still underplays importance of sepsis (only peritonitis?)
Current CCQUIN focused on sepsis in EAU/SAU/EDU
KSS/Wessex have sepsis collaboratives on going
January collaborative meeting will strongly focus on sepsis
This should be an area of major improvement for us.
Antibiotics prior to surgery

Antibiotic / % cases

Average for all
3. Ensure patients arrive in operating theatre within 2 (Cat 1) and 6 hrs (Cat 2A) of booking

NELA question timing 4.1 minus 2.2
Stratified by urgency. NELA question 3.22
Standard as NELA (2 hrs for 1, 2A 2-6 hrs, 2B 6-18hrs)
Recommended by EPOCH, ELPQuiC and PPU
Evidence lies in sepsis treatment (Kumar slide)
3. Ensure patients arrive in operating theatre within 2 (Cat 1) and 6 hrs (Cat 2A) of booking

KEY STANDARDS

• Trusts should ensure emergency theatre access matches need and ensure prioritisation of access is given to emergency surgical patients ahead of elective patients whenever necessary as significant delays are common and affect outcomes.

• The time from decision to operate to actual time of operation is recorded in patient notes and audited locally.

• Delays in surgery for the elderly are associated with poor outcome. They should be subject to regular and rigorous audit and this should take place alongside identifiable agreed standards.
3. Ensure patients arrive in operating theatre within 2 (Cat 1) and 6 hrs (Cat 2A) of booking

When assessed against documented operative urgency:

- **77%** – 1: Immediate (<2 hours).
- **86%** – 2A: Urgent (2–6 hours).
- **84%** – 2B: Urgent (6–18 hours).

**Arrival in theatre was therefore most frequently delayed in patients requiring immediate surgery.**

At 133 hospitals (75%), at least 80% of patients arrived in theatre within a timescale appropriate to their operative urgency.

No substantial variation was observed by time or day of either surgery or hospital admission.

NELA 2015
Time to Operating Theatre - Immediate (<2 hours)

Hospitals

- Hospital 13
- Hospital 29
- Hospital 10
- Hospital 27
- Hospital 15
- Hospital 20
- Hospital 11
- Hospital 26
- Hospital 28
- Hospital 25
- Hospital 5

Average for all
4. Start goal directed fluid resuscitation using dynamic cardiovascular variables/indices

- Recommended by ELPQuiC, EPOCH and PPU
- Significant evidence available and at least no harm
- Patients often have significant perioperative fluid shifts
- NELA 4.4 (cardiac output measurement)
4. Start goal directed fluid resuscitation using dynamic cardiovascular variables/indices

- Goal directed fluid therapy was used in the care of half (52%) of patients during surgery.
- At 12% of hospitals, goal directed fluid therapy was used in at least 80% of patients, whereas at 28% of hospitals it was used in less than 40% of cases (Figure 11).
- Goal directed fluid therapy was more commonly used in the care of higher-risk patients.
  - 56% of patients aged over 80 years.
  - 62% of patients documented preoperatively to be highest-risk.
  - 60% of those requiring immediate surgery.
From: Effect of a Perioperative, Cardiac Output–Guided Hemodynamic Therapy Algorithm on Outcomes Following Major Gastrointestinal Surgery: A Randomized Clinical Trial and Systematic Review


Figure Legend:
Cumulative Incidence of Mortality Up to 180 Days After Surgery Using a Cardiac Output–Guided Hemodynamic Therapy Algorithm Intervention vs Usual Care
• Relative to perioperative fluid therapy, three inescapable conclusions exist: over hydration is bad, under hydration is bad, and what we assume about the fluid status of our patients may be incorrect.

• Dynamic indices have been repeatedly shown to accurately reflect fluid responsiveness and do so better than commonly used static hemodynamic parameters (CVP, RVEDP/V).

• We recommend that both perioperative fluid choice and therapy be individualized. Patients should receive fluid therapy guided by predefined dynamic physiologic targets.

• SV/CO, PPV, (SVV, SPV) all recommended
Goal Directed Fluid Therapy

Hospitals

GDFT / % cases

Average for all

Hospital 13  Hospital 29  Hospital 10  Hospital 27  Hospital 15  Hospital 20  Hospital 11  Hospital 26  Hospital 28  Hospital 25  Hospital 5
5. Ensure all patients go to ICU

- Mortality rates for general surgical patients identified from the CHKS and ICNARC databases.
5. Ensure all patients go to ICU

KEY STANDARDS

• An assessment of mortality risk should be made explicit to the patient and recorded clearly on the consent form and in the medical record.

• Patients must be actively involved in shared decision making and supported by clear information from healthcare professionals to make fully informed choices about treatment and ongoing care that reflect what is important to them.
5. Ensure all patients go to ICU

<table>
<thead>
<tr>
<th>Preoperative documentation of risk</th>
<th>Number of patients</th>
<th>Frequency (%)</th>
<th>Proportion of patients admitted directly to a high dependency or intensive care unit after surgery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>3,826</td>
<td>19</td>
<td>34 ***</td>
</tr>
<tr>
<td>High 5-10%</td>
<td>2,386</td>
<td>12</td>
<td>64</td>
</tr>
<tr>
<td>Highest &gt;10%</td>
<td>5,059</td>
<td>25</td>
<td>89</td>
</tr>
<tr>
<td>Not documented ?</td>
<td>8,912</td>
<td>44</td>
<td>53</td>
</tr>
</tbody>
</table>

NELA 2015
5. Ensure all patients go to ICU

- Preoperative P POSSUM educates risk for patient consent
- Who would not admit an:
  - CABG
  - Oesophagectomy
  - Whipples
  - Free Flap
  - Craniotomy
- NELA now suggesting all patients
Critical Care admission for all patients (ALL Risks)

Hospitals

- Hospital 13
- Hospital 29
- Hospital 10
- Hospital 27
- Hospital 15
- Hospital 20
- Hospital 11
- Hospital 26
- Hospital 28
- Hospital 25
- Hospital 5

Average for all

 Observatory

- Hospital 13
- Hospital 29
- Hospital 10
- Hospital 27
- Hospital 15
- Hospital 20
- Hospital 11
- Hospital 26
- Hospital 28
- Hospital 25
- Hospital 5
Consultant involvement

Each higher risk case (>5%) should have the active input of a consultant surgeon and consultant anaesthetist

Cases with higher risk (>10%) should be carried out under direct supervision of consultant surgeon and anaesthetist

NELA 2015
## Consultant involvement by risk

Proportion of patients whose care during surgery was directly supervised by consultant surgeons and consultant anaesthetists by patient characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of patients</th>
<th>Both consultants present in theatre</th>
<th>Consultant surgeon present</th>
<th>Consultant anaesthetist present</th>
<th>Neither consultant present in theatre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>3,826</td>
<td>61% ***</td>
<td>82% ***</td>
<td>71% ***</td>
<td>9% ***</td>
</tr>
<tr>
<td>High</td>
<td>2,386</td>
<td>67%</td>
<td>85%</td>
<td>76%</td>
<td>6%</td>
</tr>
<tr>
<td>Highest</td>
<td>5,059</td>
<td>73%</td>
<td>89%</td>
<td>81%</td>
<td>4%</td>
</tr>
<tr>
<td>Not documented</td>
<td>8,912</td>
<td>62%</td>
<td>83%</td>
<td>71%</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>20,183</strong></td>
<td><strong>65%</strong></td>
<td><strong>85%</strong></td>
<td><strong>74%</strong></td>
<td><strong>7%</strong></td>
</tr>
</tbody>
</table>
### Consultant involvement by time of day

Proportion of patients whose care during surgery was directly supervised by consultant surgeons and consultant anaesthetists by time of day of arrival in operating theatre

<table>
<thead>
<tr>
<th>Time of arrival in operating theatre</th>
<th>Monday–Friday</th>
<th>Saturday–Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Both consultants</td>
<td>Consultant surgeon</td>
</tr>
<tr>
<td>0800–1159</td>
<td>76%***</td>
<td>87%***</td>
</tr>
<tr>
<td>1200–1759</td>
<td>75%</td>
<td>88%</td>
</tr>
<tr>
<td>1800–2359</td>
<td>61%</td>
<td>83%</td>
</tr>
<tr>
<td>0000–0759</td>
<td>41%</td>
<td>69%</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>69%</strong></td>
<td><strong>85%</strong></td>
</tr>
</tbody>
</table>
Consultant Anaesthetist in Theatre

<table>
<thead>
<tr>
<th>Site</th>
<th>Pre-ELPQuiC</th>
<th>Post-ELPQuiC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>48%</td>
<td>79%</td>
</tr>
<tr>
<td>Site 2</td>
<td>56%</td>
<td>65%</td>
</tr>
<tr>
<td>Site 3</td>
<td>49%</td>
<td>56%</td>
</tr>
<tr>
<td>Site 4</td>
<td>87%</td>
<td>98%</td>
</tr>
</tbody>
</table>
Post CCT Surgeon in theatre (%)

- **Site 1**: Pre-ELPQuiC: 44%, Post-ELPQuiC: 94%
- **Site 2**: Pre-ELPQuiC: 43%, Post-ELPQuiC: 54%
- **Site 3**: Pre-ELPQuiC: 82%, Post-ELPQuiC: 93%
- **Site 4**: Pre-ELPQuiC: 76%, Post-ELPQuiC: 99%
Consultant involvement

• Evidence from acute medicine suggests that work patterns, rather than just numbers of on-call consultants, influence patient outcomes; with reduced mortality rates at hospitals where on-call consultants were:
  • Free from fixed-commitments
  • Were on-call for blocks of at least two consecutive days
  • Where at least two consultant ward rounds occurred every day.

NELA 2015
Emergency Laparotomy Collaborative Care Bundle

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4. Start goal directed fluid resuscitation using dynamic cardiovascular indices
5. Ensure all patients go to critical care
Our vision

Understand significant mortality/morbidity associated with emergency laparotomy

We are here to see if we can convert ELPQuiC to larger scale (system change)

Want to use existing data collection (NELA) with little extra data collection (spot audits) to drive system improvements

Want to enable participants to develop quality improvement capabilities

Want to learn from each other.
Key dates

ELC Quality Improvement plan

Key Milestones

- **September 2015**
  - ELC LAUNCH

- **October 2015**
  - Own site work
  - Creating engagement
  - Situational awareness
  - Systems thinking
  - Data for improvement

- **February - May 2016**
  - Own site work
  - Improving care processes

- **January 2016**
  - Combined meeting
  - The Model for Improvement
  - Engaging colleagues

- **December / January 2016**
  - Own site work
  - Data collection
  - Diagnosis and planning
  - Continue to engage stakeholders

- **May / June 2016**
  - AHSSN meetings
  - Review progress
  - Learn from each other
  - Adapt change efforts

- **June - September 2016**
  - Own site work
  - Continue to improve care processes

- **September 2016 onwards**
  - Quality Collaborative meetings continue

Scaling Up Improvement

The Health Foundation
## Team Milestones 2015-17

### Team Milestones and related QI training activities

<table>
<thead>
<tr>
<th>Milestones and meetings</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oct to mid Nov</td>
<td>• QI Leads form inter-professional QI team</td>
</tr>
<tr>
<td></td>
<td>• QI Leads spread the message about ELC at their site and start to engage all stakeholders</td>
</tr>
<tr>
<td></td>
<td>• Stakeholder meeting (professionals from across the patient pathway) arranged</td>
</tr>
<tr>
<td></td>
<td>• Notes / data review of current performance ahead of Nov meetings, to include sepsis care</td>
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<td></td>
<td>• Notes / data review of current performance ahead of Nov meetings, to include sepsis care</td>
</tr>
<tr>
<td>1. Nov meeting</td>
<td>• Sharing ideas, progress</td>
</tr>
<tr>
<td></td>
<td>• Sharing data - 'where are we now' on ELC metrics</td>
</tr>
<tr>
<td></td>
<td>QI Training:</td>
</tr>
<tr>
<td></td>
<td>• Systems thinking (Process mapping and Driver Diagrams)</td>
</tr>
<tr>
<td></td>
<td>• Data analysis and usage (Runchart interpretation, data feedback, CUSUM)</td>
</tr>
<tr>
<td>1. Mid-Nov to end Jan</td>
<td>• QI teams will have used data sources (NELA etc, snapshot audits) to identify change goals for their sites &amp;</td>
</tr>
<tr>
<td>Data collection,</td>
<td>• process mapped interventions to understand the QI interventions required</td>
</tr>
<tr>
<td>diagnosis and planning</td>
<td>• Driver Diagrams created to lay out change goals and processes to be changed</td>
</tr>
<tr>
<td></td>
<td>• QI Teams reflect on experiences of successful and unsuccessful change / QI</td>
</tr>
<tr>
<td></td>
<td>(to be discussed at January meeting)</td>
</tr>
<tr>
<td>1. Jan meeting (p.m., in AHSN groups)</td>
<td>• Sharing ideas, progress, change goals</td>
</tr>
<tr>
<td></td>
<td>• Planning for change and initial PDSAs</td>
</tr>
<tr>
<td></td>
<td>QI Training:</td>
</tr>
<tr>
<td></td>
<td>• QI methodology (using and adapting the Model for Improvement and PDSA approach)</td>
</tr>
<tr>
<td>1. Feb to end May -</td>
<td>• Team start to make changes to processes (using PDSA approach as appropriate)</td>
</tr>
<tr>
<td>Initial change activities rolled out</td>
<td>• Team review NELA data regularly and use this to engage colleagues</td>
</tr>
<tr>
<td>1. May meeting</td>
<td>• Sharing ideas and progress</td>
</tr>
<tr>
<td></td>
<td>• Re-setting goals</td>
</tr>
<tr>
<td></td>
<td>QI Training:</td>
</tr>
<tr>
<td></td>
<td>• TBC, based upon local needs</td>
</tr>
<tr>
<td>1. June onwards -</td>
<td>• Team continue improving processes, with new / same goals as appropriate</td>
</tr>
<tr>
<td>Reviewing progress,</td>
<td></td>
</tr>
<tr>
<td>learning from each other,</td>
<td></td>
</tr>
<tr>
<td>adapting change activities</td>
<td></td>
</tr>
</tbody>
</table>
Local meetings

NOVEMBER 2015 – LOCAL MEETING one

1. System thinking
   - process mapping
   - driver diagrams

2. Data
   - run charts

   • What are they
   • How do we make them
   • How do analyse them
   • How to share and engage people with them

   Interactive session on run charts. Team working, annotate their own, what are they already doing.

3. CUSUM
   • What are they
   • How to interpret them
   • How to share and present them and engage stakeholders

4. Audit
   • Sampling
   • How to audit new pathways e.g. sepsis that aids emergency lap.

MAY 2016 – LOCAL MEETING two

1. PDSAs and the Model for Improvement
   • Teams bring with them a list of key features of successes/failures. They present to rest of group in 5 mins.

2. Other improvement strategies:
   • Collaborative team work
   • Michigan keystones
   • Why Matching Michigan failed

3. Leadership and how to increase excitement and drive for project

4. Collaborative work and engaging stakeholders
Data handling

- Ensure data correct and complete on NELA database
- Each trust to extract NELA data every 3 months
- Use run chart maker on website (downloadable)
- Send data to rsc-tr.emergencylaparotomy@nhs.net
  - (data sharing agreements in place?)
- Discuss own run charts
- Plan appropriate interventions
- Be ready to present and discuss at local/regional meetings
Other resources

• Website. www.emergencylaparotomy.org.uk
• Twitter handle.@ELCSavingLives
• Delegate pack.
• Trust departure pack
In-hospital mortality (crude)

Crude in-hospital mortality / % cases

Hospitals 13, 29, 10, 27, 15, 20, 11, 26, 28, 25, 5

Average for all
Quality improvement and performance

‘Every system is perfectly designed to get the results it gets. The only way to get real change is to change the system. To do this you need ‘will, ideas and execution’.

- You must have the **Will** to make the system better- this may be because you have identified poor performance or outcome through audit or patient experience
- You must have **Ideas** about how you could change things for the better
- You must have skills to make it happen: **Execution**.

Paul Batalden IHI 1984
Questions?