Dr Victoria Banks
Consultant Intensive Care Medicine & Anaesthesia

Emergency Surgery at NUH
Emergency Surgery Working Group

- Dr Andrew Hutchinson (Cons Anaesthetist)
- Dr Jonathan Mole (Cons Anaesthetist)
- Dr Jo Lamb (Cons Anaesthetist)
- Mr Abercrombie (Cons Surgeon)
- Mr Welch (Cons Surgeon)
- Dr Dhingsa (Cons Radiologist)
- Dr Mark Simmonds (Cons Intensivist)
- Dr Chana & Dr Pipe (Trainee Anaesthetists)
- Alison Adkin (Patient Safety Lead Nurse for Theatres)
- John Wells (NELA Data)
- Stephanie Brown (Emerg Surgery CQUIN nurse)
- John Seels (Data analyst)
- Better For You
- Owen Bennett
- Sarah Moppett
Case Study – Part 1

Day 1: Elective bowel resection for cancer – enhanced post op recovery
Day 4: Discharged home (Saturday)
Day 5: Readmitted 19:00, septic

- Initially seen - Foundation doctor - Blood Cultures, Abs ✓
- 22:45 CT ordered by Gen Surgical Registrar - ? anastomotic leak
- 00:00ish, d/w consultant “for conservative management” ✗

Day 6: 08:00 BP82/50.
- Ward round → laparotomy
- 14:30 in theatre - purulent peritonitis. (theatre delays)
Case Study – Part 2

Post-operatively: AICU → HDU
Day 5: WARD (Saturday)

Day 6: multiple reviews
- 15:50 ST5 // 19:40 CCOT // 22:00 F1
- SPO₂ 90%, clammy, abdo pain, T38, Low blood pressure - Chest infection

Day 7:
08:45 – Registrar review: peritonitic, faeces in drain - oral Abs + CT scan
10:00 CT backlog ‘later today’
12:50 Consultant R/V → Surgery (i.v. abx 14:00)
18:45 Theatre - washout & drains. (Delay - theatre availability)

AICU post op. 8 days critical care.
Summary

1<sup>st</sup> admission: LOS 4 days
2<sup>nd</sup> admission: LOS 23 days (13 critical care)

- Delay to recognition & treatment of sepsis x 2
- Delay to Surgical decision & CT scan & theatre access x 2

- Delays up & down chain: communication
- Night time/ Weekend inertia
- Weekend step downs / discharges
- Protocol compliance patchy: EWS triggers, sepsis
Emergency Surgery is Challenging
Emergency Surgery is Challenging

- *Limited* dedicated resources
- Low prestige *historically*
- Significant out of hours work
- *Limited* Governance/Morbidity & Mortality Reviews
- *Limited* management structure & workforce planning
- *Limited* commitment to research or training
Emergency Surgery time bomb

- 30% ↑ Emergency workload
- Increasing Age
- Co-morbidity & frailty
- Major impact on NUH resources
A Perfect Storm : Nationally

- 50,000 laparotomies/ year in UK
- 30 Day Mortality rates vary 4 - 31%
- Weekend Admission: ↑ 10% mortality
- Over 70s : at least 25% death rate
- 50% complication rate

Weathering the Storm at NUH

- Changing the way we look at the process
- Changing the way we look at the patients
- Bottom up approach – driven by shopfloor
- Taking the long view
Theatre Process changes since 2002

• ↑ Emergency Theatres
• Dedicated Emergency Theatre Consultant Anaesthetists & Consultant Lead
• ‘decanting’ emergency patients
• Earlier start times/ ↓ Turnover times
• Mathematical analysis of patient flow to ↑ efficiency/ minimise breeches
Surgical Process changes since 2002

- Dedicated consultant emergency commitments
- Increased number of ward rounds
- HPB / colorectal subspecialty input
- C32 Surgical Triage Unit – earlier senior decision-making
- Acute Abdomen Pathway: High Risk of peri-Operative Death ‘HROD’
- Weekly Emergency Surgery Governance meetings

Key Aims:
• To reduce unnecessary admissions
• To streamline sick patient decision-making and care
• To recognise complications early
• To reduce patient morbidity and time in hospital.
Governance changes

Emergency Theatre Case Review Group: ETCRG

Multi-disciplinary structured review process

Emergency Surgery Governance meetings
Recognise & Rescue
Timelines 2013

- ADMISSION
- FIRST SURGICAL REVIEW
- SENIOR SURGICAL REVIEW
- CT DONE
- DECISION TO OPERATE
- ANAESTHETIC REVIEW
- ANAESTHETIC START
- CT DONE
- DECISION TO OPERATE
- ANAESTHETIC REVIEW
- ANAESTHETIC START

URGENCY 1

Overall
ASA 3+
# 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>
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<tbody>
<tr>
<td>&lt; 6 h</td>
<td>&lt; 3 h</td>
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<tr>
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<td>92% (n=75)</td>
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<td>70.3% (n=37)</td>
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<td>6-24 h</td>
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<td>&gt; 6 h</td>
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<td>13.0% (n=100)</td>
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Key things we now knew  2013

- Sickest patients weren’t being recognised
- Sickest patients suffer the most delays
- 84% had pre-op CT scan to aid diagnosis
- Time from booking to CT reporting very variable (hours to days)
- Time from CT to decision to operate equally variable
- Patients deteriorate significantly when source control is delayed
- Only 40% went to Critical Care post op.
Driver Map for improving Emergency Laparotomy Care in NUH April 2013.

**AIM**
- Decrease:
  - Mortality 10%
  - Complications 5%
  - Reduce LOS/variability

**Primary Drivers**
- Pre-operative Care
  - Pre-operative assessment; Time to senior review, time to imaging result, time to decision to operate
  - Optimisation: sepsis bundles, fluids, analgesia, lactate/CCOT referral
  - Risk assessment: PPOSSUM, HROD documentation
    - HROD Theatre booking + expedited operation
  - Patient information / consent
  - Evidence-based Peri-op Anaesthetic management
  - Goal-directed therapy
  - Experienced surgeon and anaesthetist: Damage control surgery
  - Checklists: WHO, and End of Surgery Bundle

- Intra-operative care
  - Pre-op destination based on Risk Assessment
    - Optimal Pain & Fluid Management, Nutrition, Physiotherapy
    - Delirium Management: early HCOP involvement
  - Non-pharmacological management – conservative management

- Post-operative care
  - End of Life Pathway
  - Patient and Family Involvement

- Care of Dying
  - Discharge & Case Review

- Discharge & Case Review
  - Review of Care: Readmission Rates monitored, 30 day/6 month survivals, Complication rates(reduced)
    - Sampling notes review to decrease variability

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*Image credit: Nottingham Health Science Research Centre (HSRC)*

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*Image credit: NELA National Emergency Laparotomy Audit (NELA)*

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*Image credit: Nottingham University Hospitals (NUH)*

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*Image credit: Sign of SAFE*
Focus on High Risk Patients

54% HROD

36%

95% Hospital Deaths

ASA1

ASA2

ASA ≥ 3
High Risk Emergency Surgery Report

The Emergency Theatre Case Review Group has been tasked with monitoring and improving the recognition and escalation of Emergency Surgical patients at NUH. The following patient underwent an Emergency Laparotomy and was identified as having a High Risk of peri-Operative Death (HROD). Their care has been reviewed by the group and audited against the requirements of the Trust Emergency Surgery standards. As part of the feedback mechanism, you have been sent this report. The NUH guideline for Emergency Surgical Care is attached for your information.

Hospital Number:
Named Consultant:
Admission Date:
Emergency Laparotomy Date:
Ward:

<table>
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<th>Emergency Surgery Standard</th>
<th>Achieved?</th>
<th>Comment</th>
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Consider a case review at your

Surgical Unit.

The names of the specialties involved have been obtained from NOTIS, ORMIS and the patient’s notes.

Best Wishes,

Dr Victoria Banks
Emergency Surgery CQUIN

APRIL 2014
£1.3 million

Focuses on High Risk Patients

- Risk Assessment pre-op
- Expedited CT scan
- Consultant Surgeon theatre
- Minimise Delays to theatre
NCEPOD 2-6 hours

Emergency Laparotomy Timeline at NUH: comparison NCEPOD 2a

EARLY 2014

LATE 2014

Hospital LoS - All Patients [n=313]

LOS hospital: 20.3 days
High Risk Patient: 26 days
Critical Care LOS: 9 days
High Risk Pt: 11.5 days
How far we have come since 2002

- Consultant Anaesthetist presence:
  - 2002: 22%
  - 2010: 76%
  - 2014: 93%

- Consultant Surgeon Presence:
  - 2002: 67%
  - 2010: 67%
  - 2014: 60%

- Critical Care Admission:
  - 2002: 25%
  - 2010: 20%
  - 2014: 11%

- Overall Hospital mortality:
  - 2002: 20%

- High Risk Patient Mortality:
  - 2002: 28%
  - 2014: 20%
NUH successes

- Earlier identification of patients at High Risk of Death
- Improving efficiency within Emergency Theatres
- High levels Consultant input
- Appropriate Critical Care use
- Improved Hospital Survival
- Reduced Length of Stay variability
The Future of Emergency Surgery at NUH

• Robust & Sustainable Data collection
  - Information
  - Patient outcomes
• Communication
• Care of the Elderly
• Improved Commissioning links
• NUH as a Nationally recognised Emergency Surgery Centre? (by 2016?…2017….2020?)
National Emergency Laparotomy Audit
Dec 2013 - Dec 2015

Provision of high quality comparative data from all providers of emergency laparotomy

- 191 NHS centres
- Patient Audit published 2015
- National Guidelines/ Standards of Care