# Improving perioperative care: death, disability & digital records

# Overview

- Intro & Background
- Perioperative death & disability
  - Size & source
  - Significance
- Digital records
  - Clinical efficacy: AIMS, Beyond the OR & bigger EHR systems
  - Cost effectiveness: AIMS & EHR
- Translational clinical informatics
  - Why, what & how
- Conclusions

# Intro & background

- Graduate entry into medical school Queen's University of Belfast
  - Year in EM
  - Anaesthesia training last 7 years.
- Interest
  - HIT / EHR, Deteriorating patients & RRS / MET
  - QI - VIRTUE perioperative fluid management by foundation doctors
  - Organisational learning - black box medicine RCRR
- HIT
  - UK & Ireland - early stage adoption& some high profile failures
  - NIECR major success with access to information across silos.....
  - COI - currently early POC work on RRS based digital noting toolwith SEHSCT

# Perioperative D&D……size & source of the problem

- National confidential enquiries in early 80s
  - Deficiencies at extremes of age and in emergency care
- Observational studies 2000 - 2010
- National audits & more extensive epidemiological work last few years
- Under recognised burden……

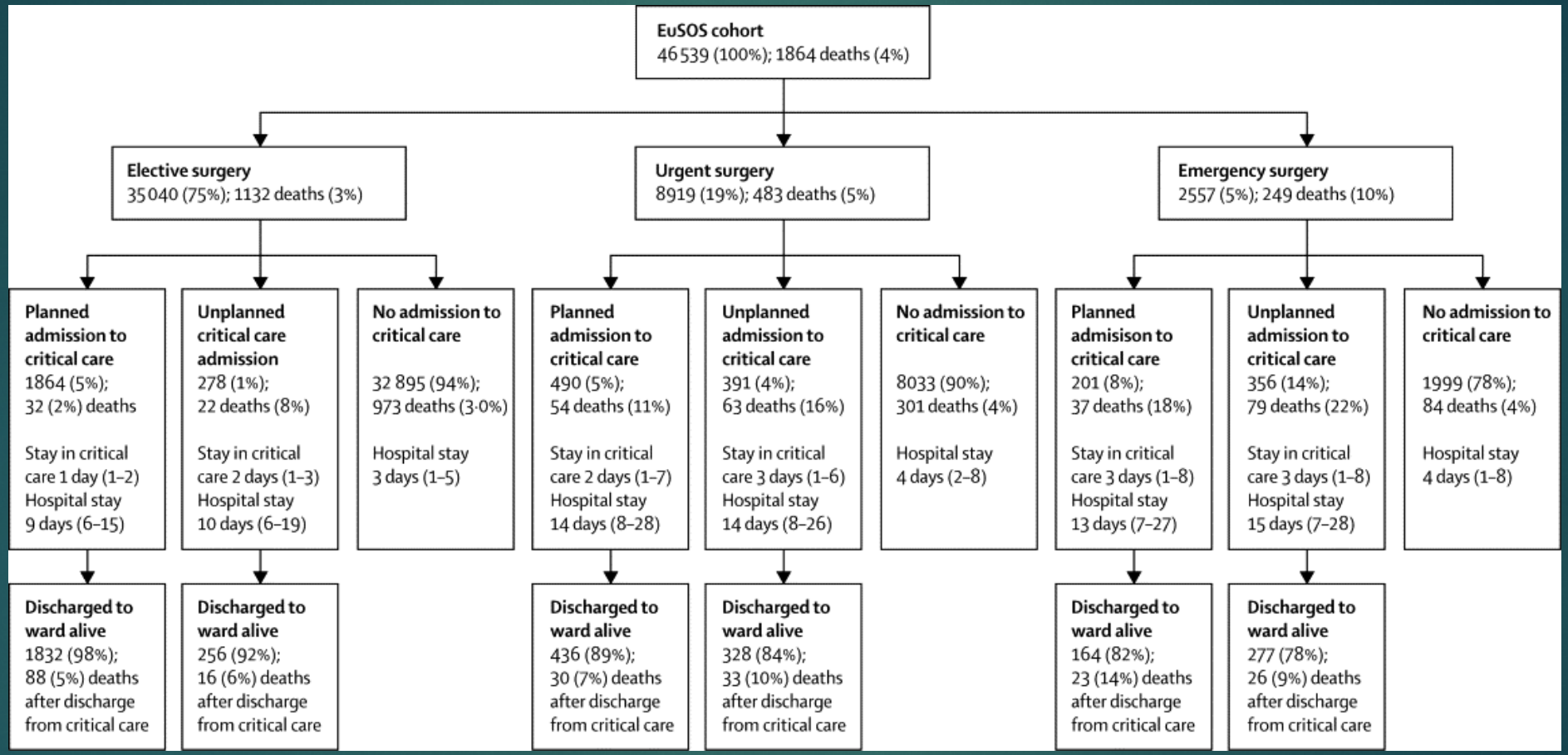
# Fecho et al. perioperative mortality 2008

- Department QI databse (04/05). 12,739 Inpatient operations
- 48h & 30d Mortality - 0.57% & 2.1%
- Statistically associated with both early & delayed mortality
  - ASA & Age (|Extremes: 0 – 1yr & 64+)
  - Emergency surgery & postoperative ICU admission
- Not statistically associated with either
  - Trauma & invasive monitoring
- Mortality higher at 30days....
  - But Emergencies. OR X8 at 48h v X3 at 30d
- Insufficient detail on adverse events...

# Pearse et al.  EuSOS 2012

- One week cross section observational cohort study 4/4/11 - 4/11/11
  - 46 539pts, 498 hospitals, 28 European nations
- 4% overall Mortality.  Elective 3%, Urgent 5% & Emergency 10%
- Elective perioperative mortality four times greater if unplanned ICU admission post op. 2% v 8%
- Significant regional variation across Europe on adjusted OR
  - Lowest in Finland - 0.44 (0.19 - 1.05)
  - Highest in developing nations 6.92 (2.37 - 20.27)

Figure 2. Planned and unplanned admission to a critical-care unit according to urgency of surgery. Data are n (%) or median (IQR). We collected data describing the first critical care admission for any individual patient.




Rupert M Pearse, Rui P Moreno, Peter Bauer, Paolo Pelosi, Philipp Metnitz, Claudia Spies, Benoit Vallet, Jean-Louis Vincent, Andreas Hoeft, Andrew Rhodes. **Mortality after surgery in Europe: a 7 day cohort study**, Volume 380, Issue 9847, 2012, 1059–1065
http://dx.doi.org/10.1016/S0140-6736(12)61148-9

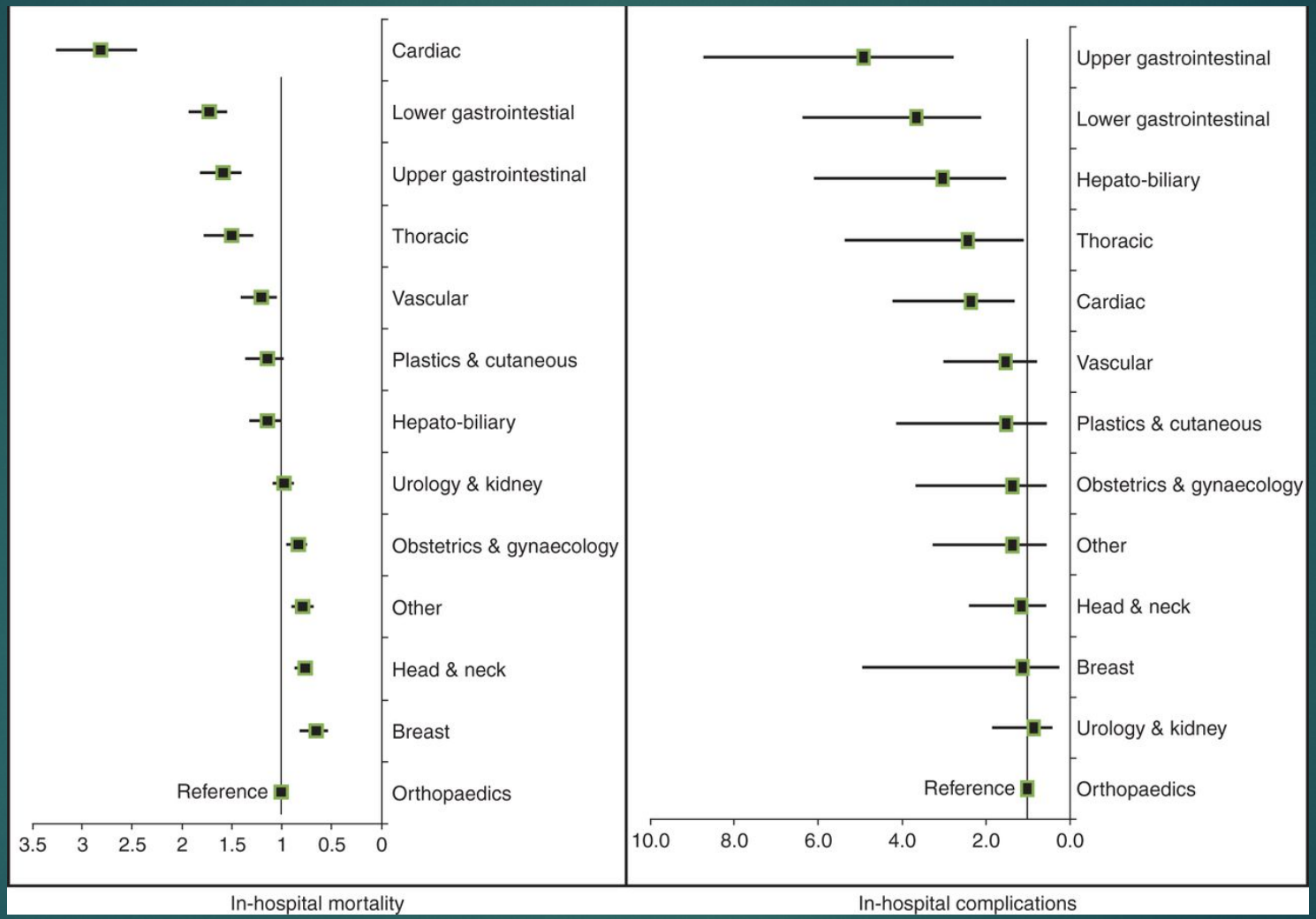
# Pearse et al. ISOS. 2016

- International 7-day cohort study of elective inpatient surgery in adults (inc.  cardiac)
  - 41,378 pts; 474 hospitals; 19H (inc UK & USA), 7M, 1L income countries.
- Overall morbidity 16.8%;
  - 19.8% High income v 11.1% low & middle income.
- Mortality 0.5% v 2.6% after complication (failure to rescue)
- 9.7% planned ICU v 0.9% unplanned ICU
  - Mortality 0.2% no post op ICU but 1.9% after complication in this group (9.5 v 2 times)

# Pearse et al. ISOS. 2016

| | All patients(n = 44 814) | Immediate post op critical care (n = 4360) | No post op critical care (n = 39 935) |
|---|---|---|---|
| **Mortality** | 207/44 814 (0.5) | 105/4360 (2.4) | 99/39 935 (0.2) |
| **Complication(s)** | 7508/44 814 (16.8) | 2198/4360 (50.4) | 5270/39 935 (13.2) |
| **Death following a complication (failure to rescue)** | 207/7508 (2.8) | 105/2198 (4.8) | 99/5270 (1.9) |

# Adjusted risk (odds ratio) of complications with 95% confidence intervals and in-hospital mortality in different surgical procedure categories.




**The International Surgical Outcomes Study group Br. J. Anaesth. 2016;117:601-609**



BJA British Journal of Anaesthesia

| Complications by type & number | | Severity of complications | | | Mortality for patients who developed complications |
|---|---|---|---|---|---|
| | N = 44 814 | Mild | Moderate | Severe | N = 207 |
| Superficial surgical site | 1320 (2.9) | 681/1320 (51.6) | 517/1320 (39.2) | 122/1320 (9.2) | 17/1320 (1.3) |
| Deep surgical site | 566 (1.3) | 120/566 (21.2) | 250/566 (44.2) | 196/566 (34.6) | 28/566 (4.9) |
| Body cavity | 340 (0.8) | 97/340 (28.5) | 136/340 (40.0) | 107/340 (31.5) | 24/340 (7.0) |
| Pneumonia | 708 (1.6) | 240/708 (33.9) | 325/708 (45.9) | 143/708 (20.2) | 55/708 (7.8) |
| Urinary tract | 681 (1.5) | 294/681 (43.2) | 333/681 (48.9) | 54/681 (7.9) | 13/681 (1.9) |
| Bloodstream | 417 (0.9) | 140/417 (33.6) | 162/417 (38.8) | 115/417 (27.6) | 48/417 (11.5) |
| | | | | | |
| Myocardial infarction | 139 (0.3) | 45/139 (32.4) | 43/139 (30.9) | 51/139 (36.7) | 26/139 (18.7) |
| Arrhythmia | 1222 (2.7) | 468/1222 (38.3) | 568/1222 (46.5) | 186/1222 (15.2) | 74/1222 (6.1) |
| Pulmonary oedema | 330 (0.7) | 127/330 (38.4) | 141/330 (42.8) | 62/330 (18.8) | 34/330 (10.3) |
| Pulmonary embolism | 78 (0.2) | 17/78 (21.8) | 33/78 (42.3) | 28/78 (35.9) | 5/78 (6.4) |
| Stroke | 111 (0.2) | 31/111 (27.9) | 28/111 (25.2) | 52/111 (46.9) | 18/111 (16.2) |
| Cardiac arrest | 153 (0.3) | N/A | N/A | 153/153 (100.0) | 91/153 (59.5) |
| | | | | | |
| Other complications | | | | | |
| Gastrointestinal bleed | 201 (0.4) | 95/201 (47.3) | 66/201 (32.8) | 40/201 (19.9) | 24/201 (11.9) |
| Acute kidney injury | 778 (1.7) | 423/778 (54.4) | 203/778 (26.1) | 152/778 (19.5) | 76/778 (9.8) |
| Postoperative bleed | 1362 (3.0) | N/A | 1147/1362 (84.2) | 215/1362 (15.8) | 55/1362 (4.0) |
| ARDS | 142 (0.3) | 46/142 (32.4) | 41/142 (28.9) | 55/142 (38.7) | 34/142 (23.9) |
| Anastomotic leak | 208 (0.5) | 52/208 (25.0) | 62/208 (29.8) | 94/208 (45.2) | 21/208 (10.1) |
| All others | 2934 (6.5) | 1342/2925 (45.9) | 1200/2925 (41.0) | 392/2925 (13.4) | 83/2925 (2.8) |
| | | | | | |
| Total infectious complications | 4032 (34.5) | 1572/4032 (39.0) | 1723/4032 (42.7) | 737/4032 (18.3) | 104/4032 (2.6) |
| Total cardiovascular complications | 2033(17.4) | 688/2033 (33.8) | 813/2033 (40.0) | 532/2033 (26.2) | 141/2033 (6.9) |
| Total other complications | 5625 (48.1) | 1958/5625 (34.8) | 2719/5625 (48.3) | 948/5625 (16.9) | 158/5625 (2.8) |
| Total number of complications | 11 690 | 4218/11 690 (36.1) | 5255/11 690 (45.0) | 2217/11 690 (19.0) | 207/7508 (2.8) |

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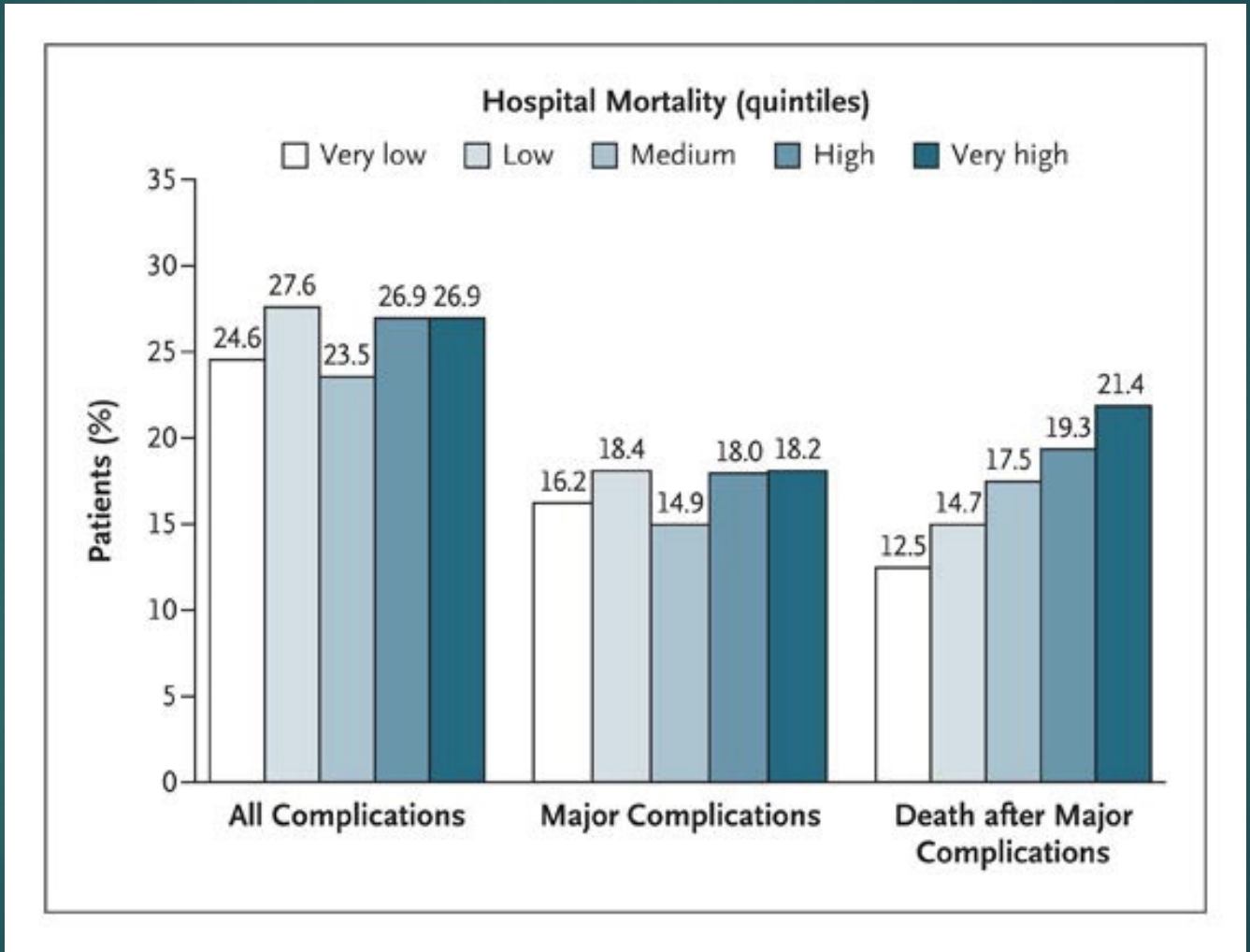
# Ghaferi. Variation in mortality 2009

- ACS SQIP 2005 - 2007. Complication & failure to rescue rate.
  - 84,730pts general & vascular procedures.
  - Mortality quintiles very low to very high.
  - 3.5% - 4.6% - 4.8% - 5.8% - 6.9%
- All complication & major complication rates flat across quintiles
- But FTR ranges from 12.5% to 21.4%
  - AKI, Haemorrhage, Sepsis (Deep wound & septic shock)

# Rates of All Complications, Major Complications, and Death after Major Complications, According to Hospital Quintile of Mortality.




Ghaferi AA et al. N Engl J Med 2009;361:1368-1375.

The NEW ENGLAND JOURNAL of MEDICINE

# Emergency general surgery burden

- UK Emergency laparotomy network first report 2012
  - Mortality in under 50 ~ 10% increasing by ~4% per 10 yrs in age
  - 39.1% planned L1 care
  - 50% of all were >60 & ASAIII, 22% L1 care post op with 17% mortality...
- Scott et al. JAMA surg. 2016 – top 7 operations causing 80% clinical burden of operative emergency general surgery
  - Looked at D&D
  - Death 22% laparotomy
  - Comp. Rate 40 - 45%.. Small bowel, colon, PUD procedures

From: **Use of National Burden to Define Operative Emergency General Surgery**

JAMA Surg. 2016;151(6):e160480. doi:10.1001/jamasurg.2016.0480

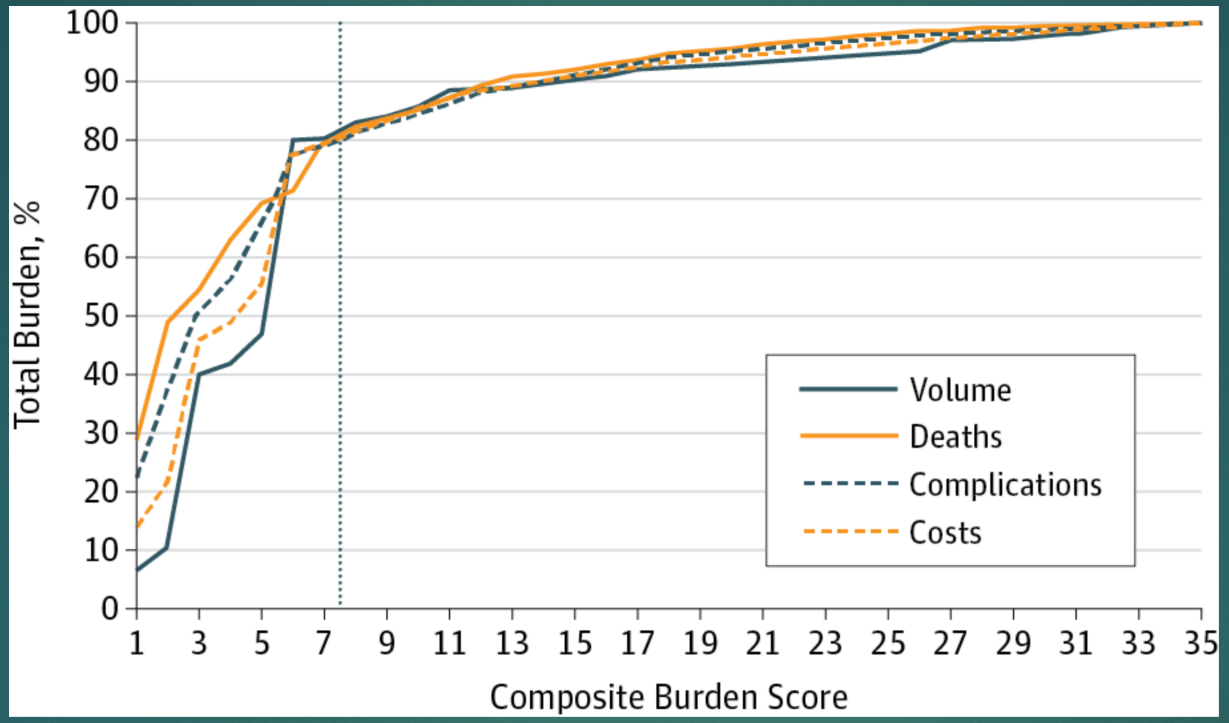



Figure Legend:

Cumulative National Burden of Emergency General Surgery Procedures, by RankEach line represents the proportion of cumulative national burden of procedure volume, patient deaths, complications, and costs. The vertical dotted line delineates the top 7 ranked procedures, which accounted for approximately 80% of all cumulative burden. Data were obtained from the National Inpatient Sample for admissions between 2008 and 2011.

From: **Use of National Burden to Define Operative Emergency General Surgery**

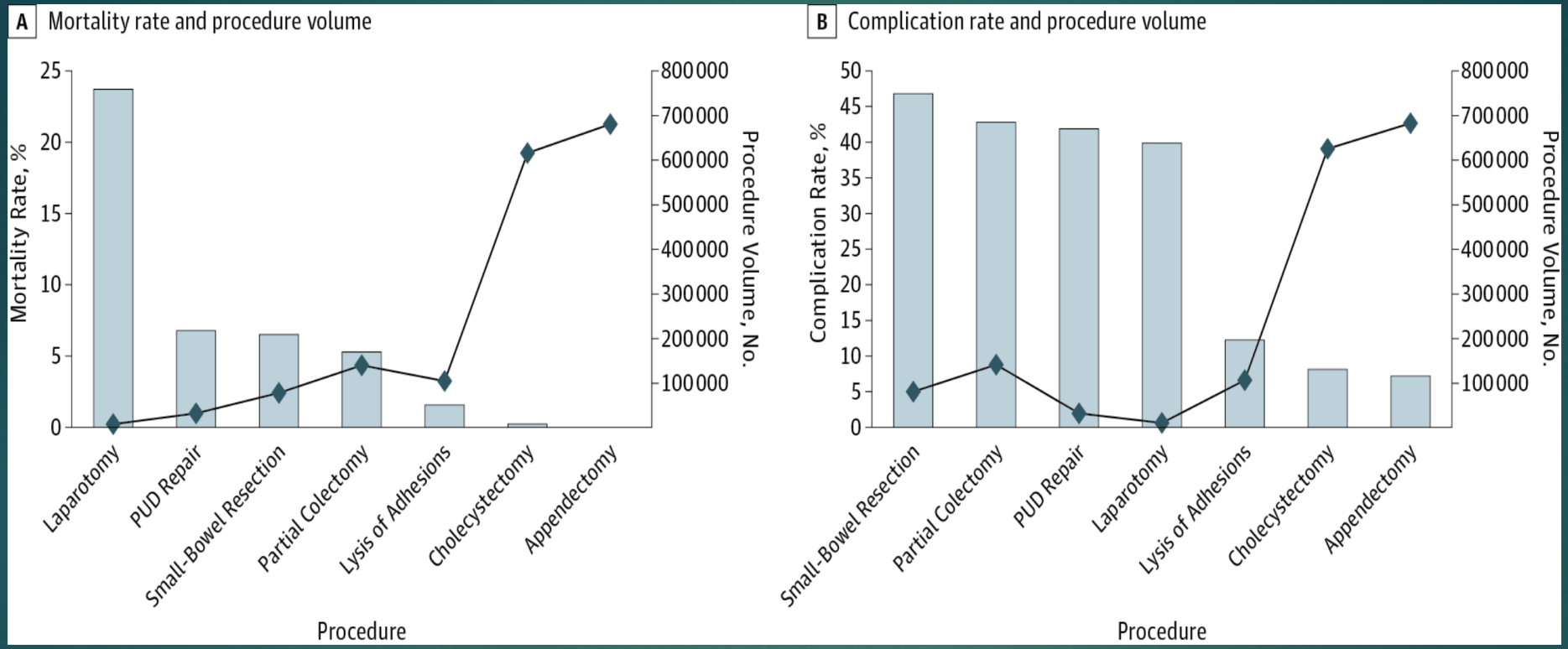


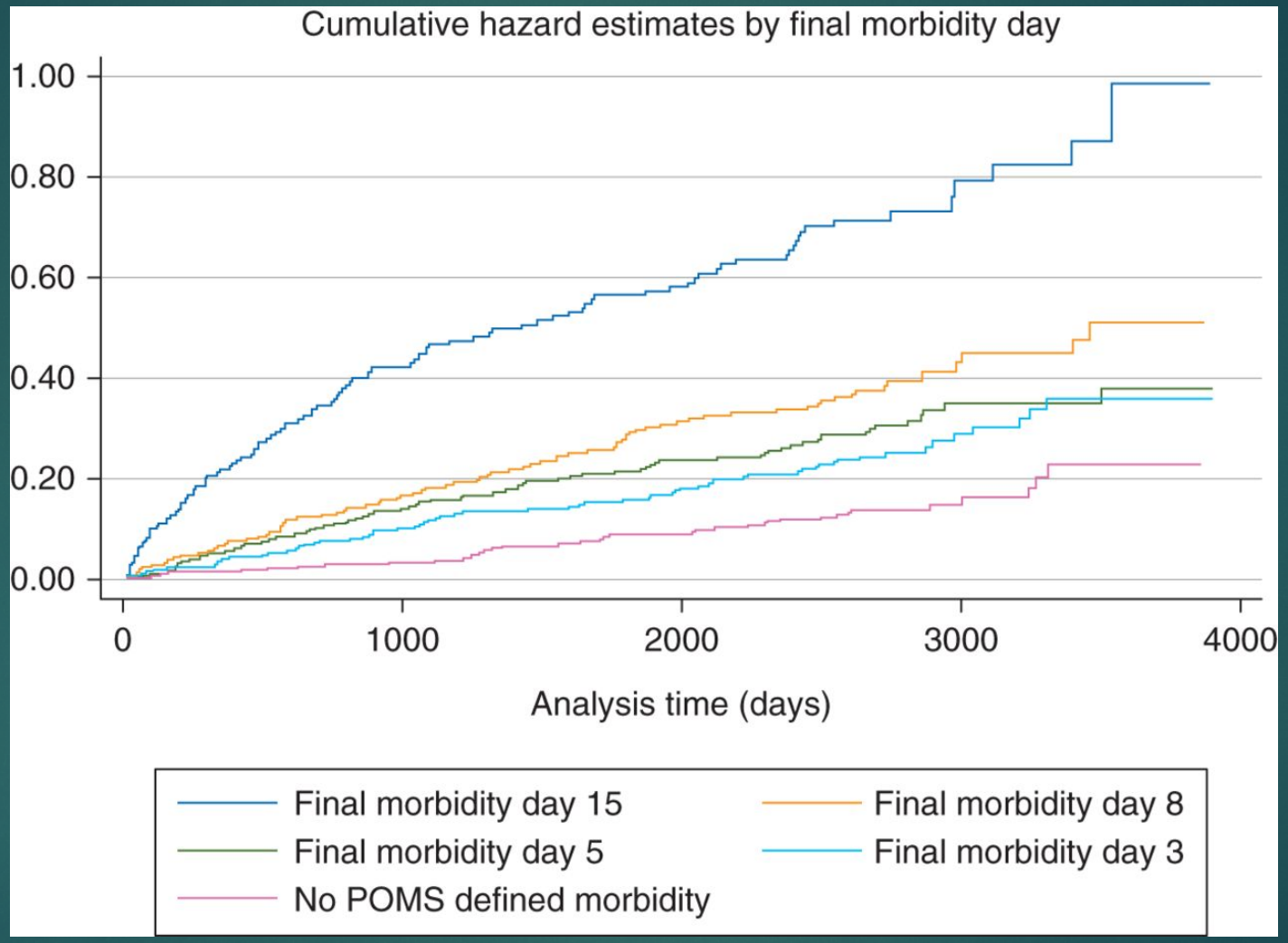

Figure Legend:

Comparison of Mortality and Complication Rates With Procedure VolumeAssociation between mortality (A) and complication (B) rates and the volume of procedures. Data were obtained from the National Inpatient Sample for admissions between 2008 and 2011. PUD indicates peptic ulcer disease.

# Emergency general surgery complications

- Scarborough et al. JAMA surgery 2016
  - 2012 – 2013 ACS NSQIP data base on EGS procedures.  79,183 pts
- Used population attributable fractions to estimate impact of 8 complications
  - Bleeding & pneumonia……

## Cumulative hazard plot for mortality after postoperative morbidity according to FMD.




S. R. Moonesinghe et al. Br. J. Anaesth. 2014;113:977-984



BJA British Journal of Anaesthesia

# Significance

- Big problem – high volume
  - 10% High risk
  - Morbidity varies up to around 50% in emergency cases
  - Affects patients long term survival (3yrs after)
- Complications amplify mortality especially if L1 post op
  - Significant postoperative exposure to L1 care in terms of LOS
  - Focus on part of the journey is not enough

# Digital records & perioperative outcomes

- Clinical efficacy:
  - AIMS
  - Beyond the OR
  - Bigger EHR systems
- Cost effectiveness: AIMS & EHR
  - Promise & potential
  - Population & provider perspective

# Anaesthesia Information Management systems

- Technophilic speciality and AIMS from 1980s
  - Improved technology & functional complexiy
- Diverse functional characteristics & focus in literature
  - Phase of care, technical aspects & patient safety
- Temporal distinction around alerting
  - Real-time, near real-time or retrospective alerts
- Two systematic, one narrative & a simple review
  - Clinical or administrative processes or tasks

# Clinical care

- Antibiotics & beta blockers
- Antiemetics
- Blood pressure
- Glucose management
- Tidal volumes

# Administrative, resource or technical functions

- Documentation
- Fresh gas flow
- Education & training
- Integration, data management & analytics
- OR management

# EHR beyond the OR

- Surgical ICU & Cardiac surgical care
  - CLABSI – 85% decrease but not for LOS/C.Diff/Readmission
  - POAF – better compliance with process  but low uptake
- Perioperative care in general – Systematic review
  - Observational studies
- Methodological limitations  with service development interventions
  - Low evidence
  - Highlights implicit value as enabler in QI
- Magical thinking & confounding

# EHR – in bigger systems.....

- To leverage EHR for better outcomes need to appreciate the whole perioperative journey.
  - LOS & immediate, intermediate and longer term outcomes determined by many factors.
  - Examples of impact in other specialties & organisational levels are important in understaning the "biological" mechanism of EHR impact on care.
- Early studies tended to be single centre evangelist adopters
- Evolving evidence on outcomes at higher levels.

# EHR & Medical care Pre-HITECH

- Early health technology assessment highlighted improved process adherence for CDSS
  - Specialist home grown systems
- Jones et al. National cohort study
  - EHR capability 2003 - 2006 & hospital quality data 2004 - 2007
  - AMI, Heart failure, Pneumonia
  - No v basic v advanced EHR
  - Quality change 2004 v 2007 adjusted relative to no EHR
  - Hear failure only significant increase in quality and only for basic EHR
  - Some process indicators more individual performance dependent than others?

# EHR – ehealth perspective

- Systematic overview (Black et al 2011) grouped into themes
  - Storing/managing/transmitting data
  - Clinical decision support
  - Facilitating care from a distance
- Diverse body of literature (53 reviews & 55 supplemental reviews)
  - Narrative synthesis – Weak & inconsistent empirical evidence for benefit
- Insight in to
  - EHR dimensions individual v aggregate...
  - eHealth equivalent of Mechanism of action....

# EHR & medical care post HITECH

- AMI (Enriquez et al.) & Ischaemic Stroke (Joynt et al.)
  - EHR adoption / capability & Quality of care & outcomes
  - National registries 2007 – 2010
- Stroke
  - No significant improvement after controlling for confounders
  - But less likely to have LOS>4days & increased component care with EHR
- AMI
  - No significant difference in STEMI care
  - But NSTEMI, UFH dosing and risk of major bleeding & mortality lower with full EHR

# EHR– more recent evidence

- Medicare beneficiaries (Lammers 2016)
  - HRR measures of physician EHR adoption v ACSC admissions & readmissions (DM, IHD, CHF, COPD/asthma)
  - Physician adoption reduced admissions not readmissions
- Readmissions more difficult to influence with single site EHR
  - Interoperability & health information exchange a big issue around preventing admissions between providers
- Barnett (2016) observational study of EHR adoption / upgrade on mortality
  - No significant increase in mortality
  - But signal of work around

# EHR – more recent evidence 2

- Nguyen (2014) demonstrated multidimensional evaluation framework to assess benefits & issues - highlighting EHR complexity
  - Quality, use & intended use, net benefit & contingent
- Adler-Milstein (2016) highlighted temporal trends with EHR adoption and hospital performance
  - EHR adoption over time v process, pt satisfaction & efficiency
- Campanella (2015) reported strongest empirical evidence (SR & MA) of EHR on health care quality to date
  - Documentation time, guidline adherence medication error, ADE & mortality
- Yanamdala (2016) observational study with conflicting results
  - Mortality, readmission, PSI & LOS in surgical patients. Stratified by No, partial & Full EHR

From: **Complications and Failure to Rescue After Inpatient Noncardiac Surgery in the Veterans Affairs Health System**

JAMA Surg. 2016;151(12):1157-1165

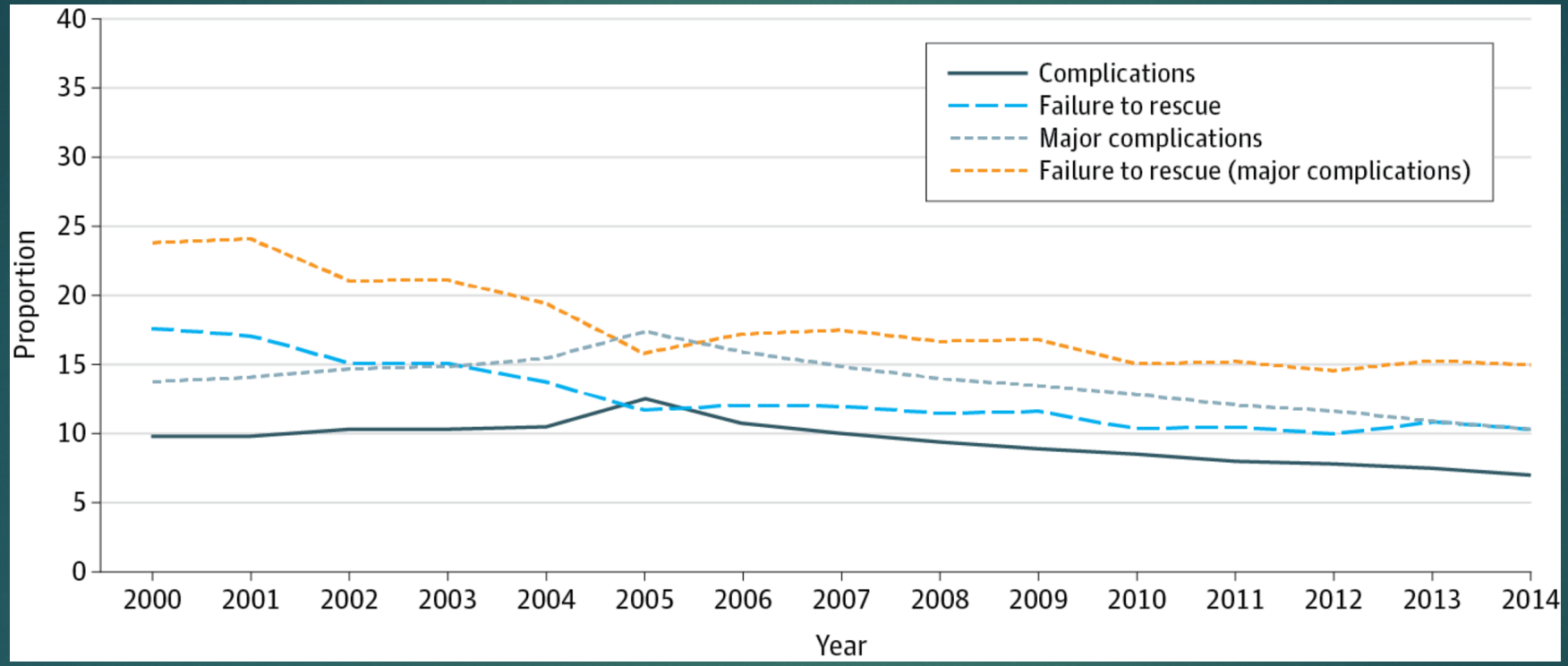



Figure Legend:

Thirty-Day Outcomes During the Study PeriodAll 30-day outcomes decreased during the study period (trend test, P<.001 for all).

# Cost effectiveness / ROI……..

- RAND (2005) estimated saving of $81billion annually
  - Based on ten year adoption & Non-health industry estimates
- Children's medical center – EHR increased OR revenue by 53%
  - Ambulatory v Inpatient case load changes in main OR
- Rate of growth in health spending short of 1.5% productivity improvement
  - But is heading away from national spending prediction
  - Focus on interoperability, adoption & utility

# Cost effectiveness / ROI……..

- More recent observationalstudy on Medicare expenditure & EHR adoption (Lammers 2016) at hospital referral region level
  - $3.8 Billion decrease in FFS
  - $1.6 Billion decrease in acute care
  - Increase in lab $0.55 per beneficiary
- A study of five ambulatory offices with 28 providers did show significant logistical savings
  - Initial costs recaptured in 16 months (18 – 36 range cited)
  - Annual estimated savings $9,983 per provider

# Cost effectiveness / ROI summary

- Lies, dam lies, statistics, health economics
  - Who pays v who profits disconnect
  - Productivity & efficiency v revenue generation
- Difficult analysis & gets harder for bigger implementations
  - More and more assumptions with greater influence of hidden costs and exposure to value of money over time
- What will it cost for next generation technology & is that affordable
- Incentive & responsibility to demand more from vendors…….

# Translational clinical informatics

- Why
  - EHR technology needs to advance
  - Adoption of EHR is high
- What & how
  - Two big challenges -
    - Design / develop better solutions
    - Demonstrate - Usability & utility

# AIMS/EHR - Why TCI?

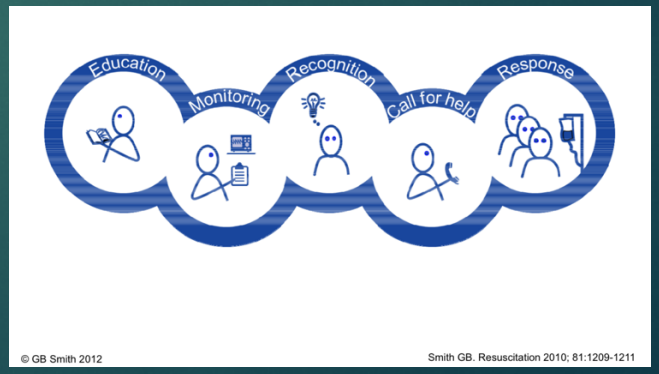
- Perioperative outcomes & whole patient journey
  - Some examples of EHR / AIM use to drive QI
- Sociotechnical insight v magic thinking
  - Primary & secondary use of clinical information
  - Processing clinical information v information for clinical processes
- Usability and interoperability highlighted as critical
- Anaesthetists (perioperative physicians) are well placed to guide development of digital records

# How – Design (Basic Science)

- Problems: Understand antecedents to adverse clinical outcomes in perioperative care
  - "Weak Spots"
  - Retrospective case record review
- Performance: Human factors and ergonomics
  - HIT safety framework
- Processes: Quality improvement science – Demming
  - Rapid response system perspective

# Failure to rescue in perioperative care

- Chain of prevention in rapid response systems
  - Smith  2010
  - Sorensen 2015
- How could technology improve
  - Automation?
  - Alerting?
  - Authoring?



# Performance of rapid response systems of care in a district general hospital: results of an immediate care audit project

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## Introduction

Over the last 20 years, a number of clinical and logistical forces have driven significant changes to acute and emergency care provision in the UK. Clinically, early reports identified the need to improve recognition of, and response to critical illness outside ICU [1&2] whilst the importance of effective organisational learning in improving safety and quality of care has also been highlighted [3]. Logistically, changes to postgraduate medical training and European working time directive have altered working patterns in acute care disciplines. In response to these challenges implementation of various care tools, teams and systems resulted in the development of what is now known as rapid response systems of care (RRS) [4]. Although terminology varies considerably, any system of care with a means of detecting deteriorating or abnormal physiology that triggers a predetermined response is essentially a RRS. In the UK, various bodies [5-7] have produced guidelines that advocate integration of various components of RRS as minimum standard of care. However, definitive evidence that RRS are effective is lacking [8] and reports identifying problems with immediate and ongoing emergency care are very recent [9&10]. The apparent failure of RRS to improve the quality of immediate care is not surprising as the interventions are complex, patient groups are heterogeneous and outcome measures do not include assessment of care quality as a robust universal definition does not exist. It is therefore difficult to conduct appropriate clinical trials leaving responsibility for assessment of RRS with individual organisations at a local level. This project provides a global view of RRS performance in a district general hospital by assessing overall quality of care in the 24 hours prior to ICU admission and identifies the need for multifaceted intervention to improve immediate care of acutely or critically ill patients.

## Methods

Following a pilot audit (November 2010) assessing quality of immediate care in patients admitted to ICU within 24 hours of hospital admission, subsequent audits (September 2011 & February 2012) included unscheduled ICU admissions within a week of hospital admission. All projects were registered with the governance department. Only patients over the age of 16 were included in the audits and significant remediable factors in patient care were identified by case note review. As no standard definition of satisfactory pre-ICU care exists, quality of care was assessed subjectively based on NCEPOD methods [9] and discussed with the project supervisor. It was also agreed that the pre-ICU period for case note review would be 24 hours +/- 12 hours to facilitate data collection at a convenient or logical point in the patients care. Data collection began at the beginning of each month and was terminated when at least two weeks of admissions had been reviewed. Following each audit results were presented locally and a multidisciplinary M&M meeting targeted at trainees and other frontline staff was organised to highlight problems with care after both audits.

## Results

Pilot audit: five (45%) patients were eligible for review. Three (27%) cases had significant remediable factors in care identified from case notes, all involving, actual or evolving sepsis with indeterminate early warning scores. Combination of case notes reviewed from follow up audits provided a total of 27 patients out of 42 eligible from 51 total admissions during the audit dates. One patient reviewed was excluded at analysis because duration of hospital admission exceeded predetermined duration of seven days leaving 26 patients for analysis. Mean patient age was 57.6 (51.3 - 63.9) and 17 (65%) were male. Ten (38%) patients had significant remediable factors identified in pre-ICU care of which eight (30%) cases were noted to have recurrent themes in recognition of, and response to, haemodynamic compromise (Figure 1) however; airway or respiratory emergencies were managed satisfactorily. Five (50%) cases with significant remediable factors in pre-ICU care were admitted between 1800 - 0000hrs. A large proportion of patients (40%) were admitted from emergency department of which most were managed satisfactorily (figure 2). Most patients admitted in this sample were surgical and the proportion of patients managed satisfactorily was less in this specialty (Figure 2). Furthermore, more patients were managed unsatisfactorily than satisfactorily in the surgical high dependency unit (Figure 3). One patient needed an emergent laparotomy after failure to recognise developing hypovolaemia overnight following admission with polytrauma. Another had dangerously rapid correction of hyponatraemia with inappropriate fluid resuscitation for tachycardia secondary to alcohol withdrawal. Two patients with abdominal sepsis had delayed initiation of resuscitation and source control measures. Attendance at the subsequent M&M meeting was minimal and an online survey sent to trainees had an equally disappointing response rate with only eight trainees responding, none of which were foundation trainees.

Figure 1

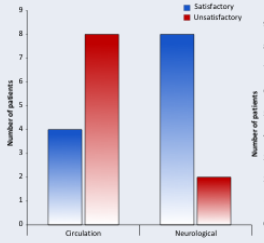



Figure 2

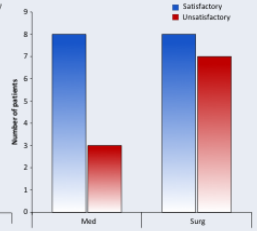
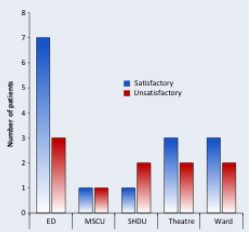



Figure 3




## Discussion

Assessment of care quality is an important indicator of RRS performance that is difficult to measure and has been the focus of confidential enquiries [9]. However, there is no objective definition of satisfactory pre-ICU care for all critically ill patients. During this project we developed a more objective working definition of satisfactory care based on the principle that good care can essentially be considered to consist of timely, appropriate adequate interactions or interventions without omission or adverse event. Further investigation will allow testing of how universally and reproducibly this can be applied to a heterogeneous group of patients by different reviewers. Furthermore, the difficulty and complexity of this audit reinforces the need for developments in the data collection process to reduce the effort of extracting information from the case notes and associated documentation.

Results from this project demonstrate a significant number of patients still receive suboptimal care prior to ICU admission. In particular, problems managing patients with actual or evolving haemodynamic compromise was a recurring theme. More specifically, problems encountered included poor accuracy, sensitivity and triggering of early warning scores and inadequate clinical review by junior staff with a lack of insight regarding acute illness severity assessment. There were also some examples that important laboratory results were documented without clinical review and emergency assessment of the cardiovascular system by many members of staff was inadequate Organisational delays in care were evident but it was difficult to identify the exact cause. Variations in quality of pre-ICU care by specialty and patient location could be misrepresentative. The apparently unfavorable care provided in surgical high dependency could reflect an inadequate level of medical cover. However, initial location of patients admitted from theatre was not recorded and this may have biased results. In contrast to this, apparently favorable care provided in the ED is probably skewed by the obvious or catastrophic nature of critical illness that was noted in most cases of satisfactory pre-ICU care. Importantly, attendance at a multidisciplinary M&M meeting targeted at trainees and other frontline staff was minimal. As effective learning at an organisational level is critical to improvements in the quality and safety of care [3] it is likely the same issues will be identified in subsequent audits.

This project demonstrates that despite implementation of RRS, there is still significant room for improvement in multiple aspects of RRS performance at both the individual and organisational level. This is a complex challenge for which there id no single solution and further work to develop a multifaceted intervention, based on the methodological and clinical issues above, is ongoing. This will involve development of a tablet computer application to enhance data collection and facilitate service monitoring by the case note review process with ongoing audit; development and implementation of an educational campaign entitled early recognition of, and response to, perioperative shock (ERRPOS) and follow up audit or surveys examining barriers to effective organisational learning in the workplace.

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Figure 1

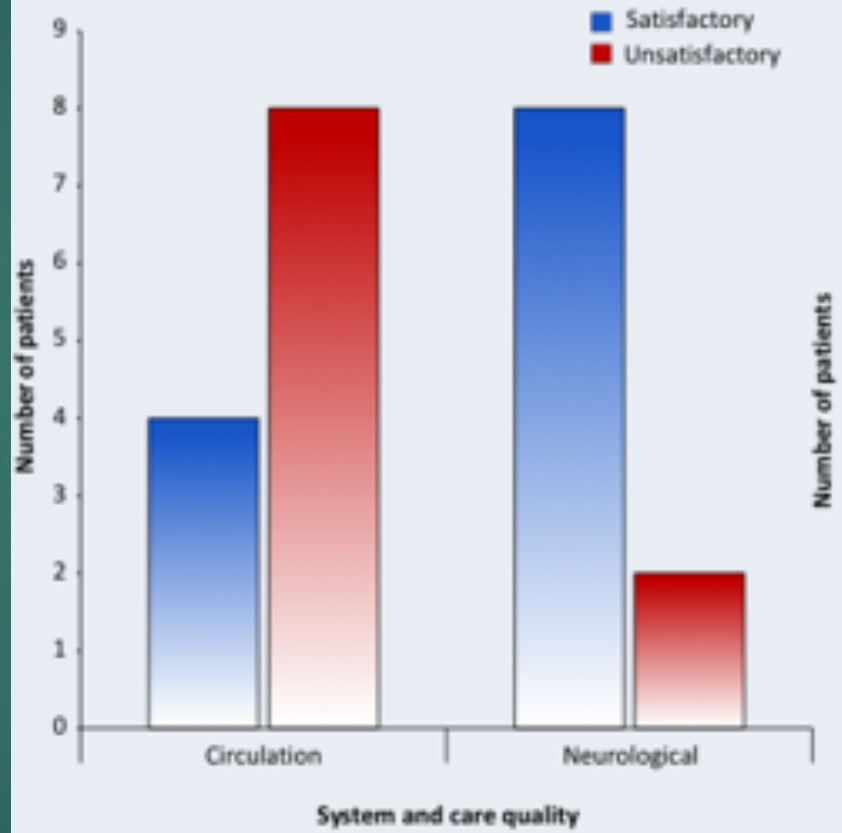
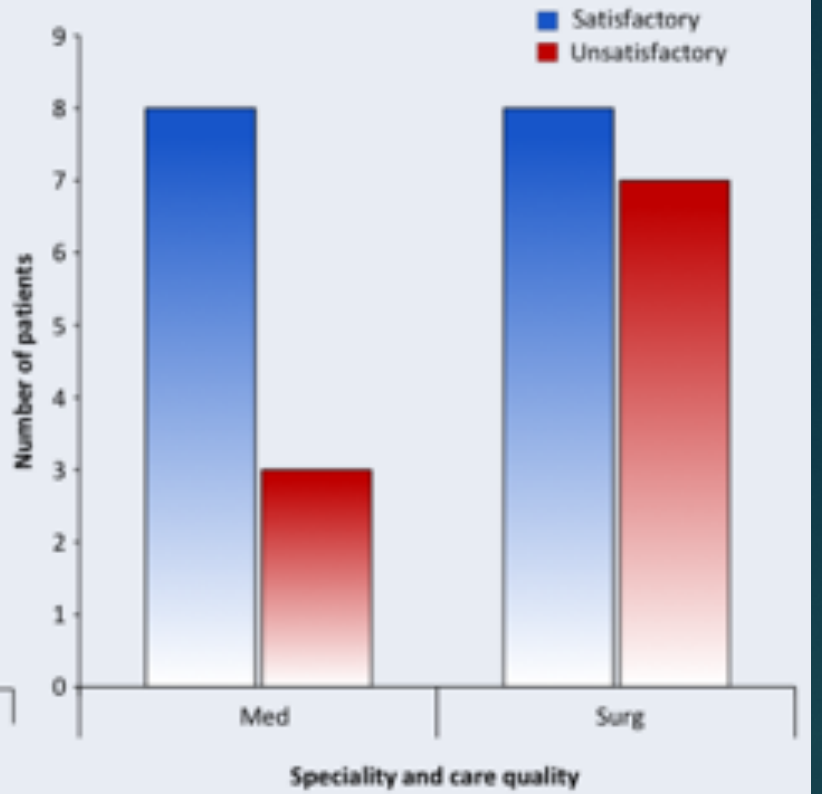



Figure 2



# Automation & alerting……

- Electronic observations
- Machine learning
- Acute kidney injury alerts

# Authoring (Clinical noting)

- Structured noting solutions established on paper
- Digital noting could support better processing of clinical information
- Minimise cognitive error & support efficiency
  - RESET Shock project
- Change to clinical processes / practice

THE ROYAL COLLEGE OF ANAESTHETISTS

# PERIOPERATIVE MEDICINE

## THE PATHWAY TO BETTER SURGICAL CARE

# How to save lives in emergency laparotomy

## Emergency Laparotomy Collaborative

**Screen patient**
NEWS/SIRS/arterial lactate

**Is the patient septic?**
Antibiotics within one hour

**Theatre**
within 6 hours of decision to operate

**ICU**
for all patients

Cardiac output monitored **goal-directed fluid therapy**

**Consultant surgeon and anaesthetist**
in theatre

www.emergencylaparotomy.org.uk
rsc-tr.emergencylaparotomy@nhs.net
@emlapcollaborative

NELA National Emergency Laparotomy Audit

The Health Foundation Inspiring Improvement

Emergency Laparotomy Collaborative

# Demonstrate – Usability testing

- Clinical decision support is advanced EHR function
  - Relies on user interaction in  heterogeneous clinical settings and scenarios
- Workflow process v processing of clinical information
- Use of simulation allows developers to optimise the later
- Usability testing of Well's clinical prediction rule  62% adoption cf 10 – 20%
- Improvements limited by rigidity of live EHR

# Utility – Simulation, Step wedge trials & statistical process control

- Assessment process by juniors evaluated in high fidelity simulation of medium acuity deteriorating patients
- Traversing the concept– clinical practice gap is difficult with service delivery solutions / interventions.
  - Randomisation not logistically or ethically possible.
- Recent reports on stepped wedge trial methodology for electronic observations solution highlights potential
- Methods of measuring & charting process, outcome & balance need further development

# Conclusion

- Burden of perioperative D&D is a public health crisis
  - Hot spots & weak spots are being identified and digital records have implicit value in delivering better care
- Evidence of consistent clinical benefits & cost effectiveness emerging & is probably improving with time
- Significant room for improvement in digital patient record technology
- Need to think outside traditional silos - with both clinical & procurement processes
- Translational clinical informatics offers an approach for development and demonstration of better digital records with clinicians in the driving seat

NEWS & EVENTS

- NIAA News Stories
- NIAA eNewletter Archive
- NIAA Events
- NIAA Internal Meetings
- External Meetings and Events
- Postgraduate Qualifications

Text size Aa Aa

NIAA > News & Events > NIAA News Stories > BJA/RCoA International Collaborative Grant 2017

NEWS 25th Aug 2016

# BJA/RCoA International Collaborative Grant 2017

The *British Journal of Anaesthesia* is delighted to give advance notice of a new **International Collaborative grant** to be awarded in Spring 2017.

**Aim**

The grants are intended to support internationally collaborative research projects in Anaesthesia, Critical Care or Pain Management and may be for salaries or for the purchase of items of equipment. We will not consider specific PhD studentships in this grants category - please see here for information on our non-clinical PhD studentship currently available through NIAA Grants 2016 R2.

**Eligibility**

Applicants should be from **outside** of Great Britain & Ireland. The proposal **must** involve real, credible, collaboration with an individual / institution based in Great Britain & Ireland. Pilot / feasibility studies are welcome.

**The Research Project**

Preference will be given to projects that involve the application of basic science to Anaesthesia, Critical Care or Pain Management but clinical research projects will also be considered. The work may be done in a university science department or in an academic clinical department, but preference will be given to projects involving co-operative research between a basic-science department and a clinical department.

**The Support**

£100,000 per grant is available. This support is for salaries (including Superannuation and National Insurance (or equivalent) contributions; the *BJA* and RCoA decline to contribute to any other indirect costs), equipment (including VAT) and running costs. Applicants will need to provide full justification of all costs applied for. Applications requesting less than the stated amounts are welcome. The BJA/RCoA will wish to share any intellectual property rights and income arising from this work with the host institution. There will be funding available to make at least one award.

**More information**

Potential applicants are welcome to contact the *BJA* Grants Officer Dr Iain Moppett with any questions about the award. A draft version of the application form is available below for information.

BJA_RCoA_Int_Proj_Grant_Form_2017 DRAFT EXAMPLE.docx (1.24 MB)

The formal application process for this award will open early next year, as part of NIAA Grants 2017 R1.

BJA/RCoA International Collaboration Gr

NIAA HSRC Health Services Research Centre
Jump to HSRC website

NAP National Audit Project
Jump to NAP website

NELA National Emergency Laparotomy Audit
Jump to NELA website

UK PERIOPERATIVE MEDICINE CLINICAL TRIALS NETWORK
Jump to CTN website

SNAP Sprint National Anaesthesia Projects

Get involved: join the NIAA mailing list

NIAA Researchers' Database

NIAA Comprehensive Review 2014 - 2015