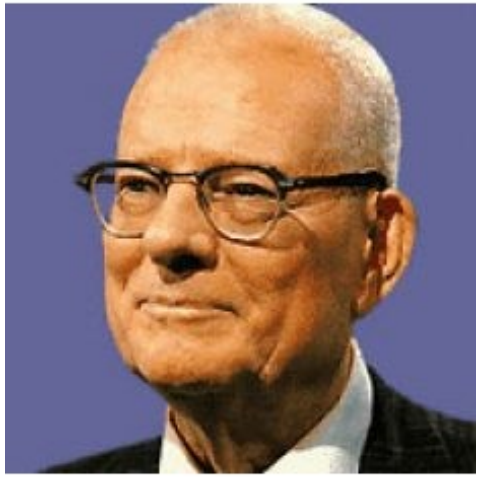
Systems Approach to Recognising and Responding to the Deteriorating Patient

CHRIS HANCOCK – LEAD, RRAILS/ ACUTE DETERIORATION PROGRAMME WALES 2010-2020

Systems approach

- The First Law of Healthcare Improvement "It is not bad people but bad systems that harm and kill our patients" (Don Berwick, IHI)

- "Put a good person in a bad system and the bad system wins, no contest" (W. Edwards Deming)



Acute deterioration: the problem that wasn't there - people do not generally suddenly deteriorate, we suddenly notice

1987 - Near all arrests in patients known to be unstable

- Sax FL, Medical patients at high risk for catastrophic deterioration, Critical Care Medicine

1990 - 84% of cardiac arrests are proceeded by deterioration of respiratory and mental function

- Schein RMH, Clinical Antecedents to in-Hospital Cardiopulmonary Arrest, Chest

1994 - 66% of cardiac arrests have documented deterioration 6 hours pre-arrest

- Franklin C, Developing strategies to prevent in-hospital cardiac arrest, Critical Care Medicine

1998 - 40% of cardiac arrests or ICU admissions are preceded by abnormal physiological observations

- McQuillan et al, NCEPOD Report

2005 - 20% of ICU admissions are avoidable

- NCEPOD Report

2007 - 11% of hospital deaths are caused by avoidable systemic errors

- NPSA

Afferent and Efferent limbs (DaVita et al 2005)

Resuscitation Council UK - 1981

Medical Emergency Teams (MET) – 1990's Australia, Ken Hillman

Rapid Response Teams (RRT) – 1996 USA

Patient at Risk Team (PART) – 1997 Royal London Hospital

Critical Care Outreach Team (CCOT) following Comprehensive Critical Care (2000)

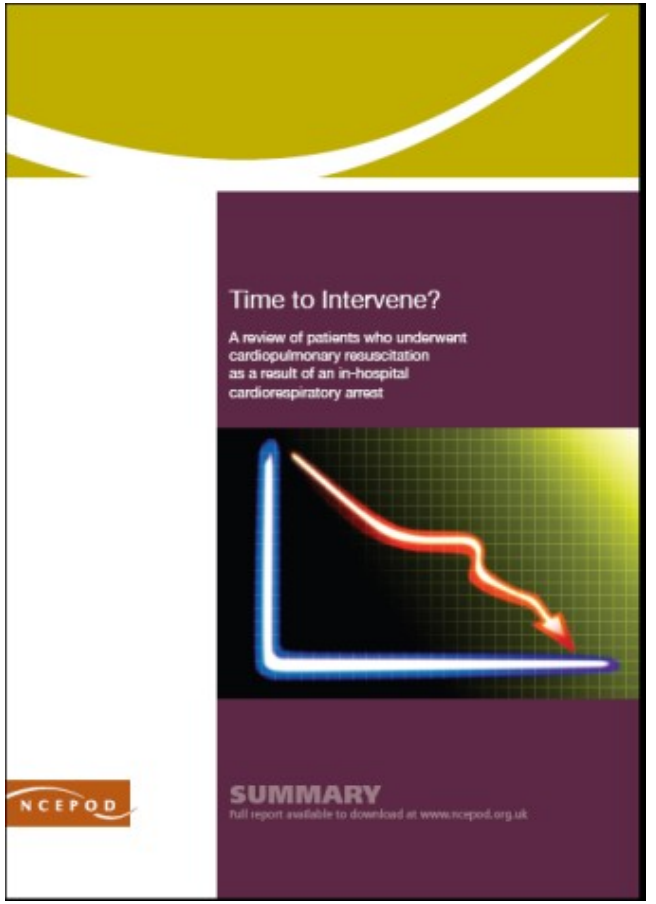
National Outreach Forum (NOrF) founded in 2004

MERIT study (2005) – MET did not significantly reduce incidence of unexpected deaths.

Recognition, escalation and response

Time to Intervene? NCEPOD 2012

- 75% of cases displayed clear warning signs that the patient was deteriorating.
- Of these patients the signs were not recognised in 35%
- Not communicated to senior doctors in 55% of cases.
- Not acted on in 56%



National Outreach Forum (NOrF)

Patient Track and Trigger

Rapid response

Education, training and support

Patient safety and clinical governance

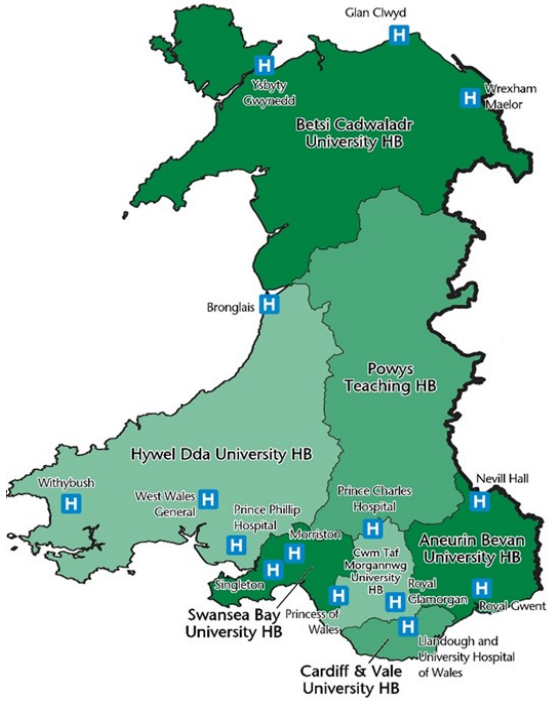
Audit and evaluation; monitoring of patient outcome and continuing quality care

Rehabilitation after critical illness (RaCI)

Enhancing service delivery

RRAILS Acute Deterioration Programme 2010-2020

- **2008–10** – 1000 Lives Campaign/ RRAILS as BTS Collaborative
- **2011** – CNO/DCMO commission to introduce NEWS/ RRAILS Steering Group
- **2014** – Sepsis WG Tier I priority/ Sepsis Patient Safety Alert + actions
- **2015** – DCMO commission to introduce sepsis SOP and metrics
- **2016** – AKI Patient Safety Alert + actions
  - NHS Wales achieves Global Sepsis Award
- **2017** – DCMO commission Peer Review of Acute Deterioration
- **2019** – CNO commissions 'Community NEWS' for Welsh DN and CR Teams
- **Throughout** – Determine Welsh response to publications on NEWS2, Sepsis 3, NICE guidance etc.
- **PLUS** work in collaboration with paediatrics, LD and social care

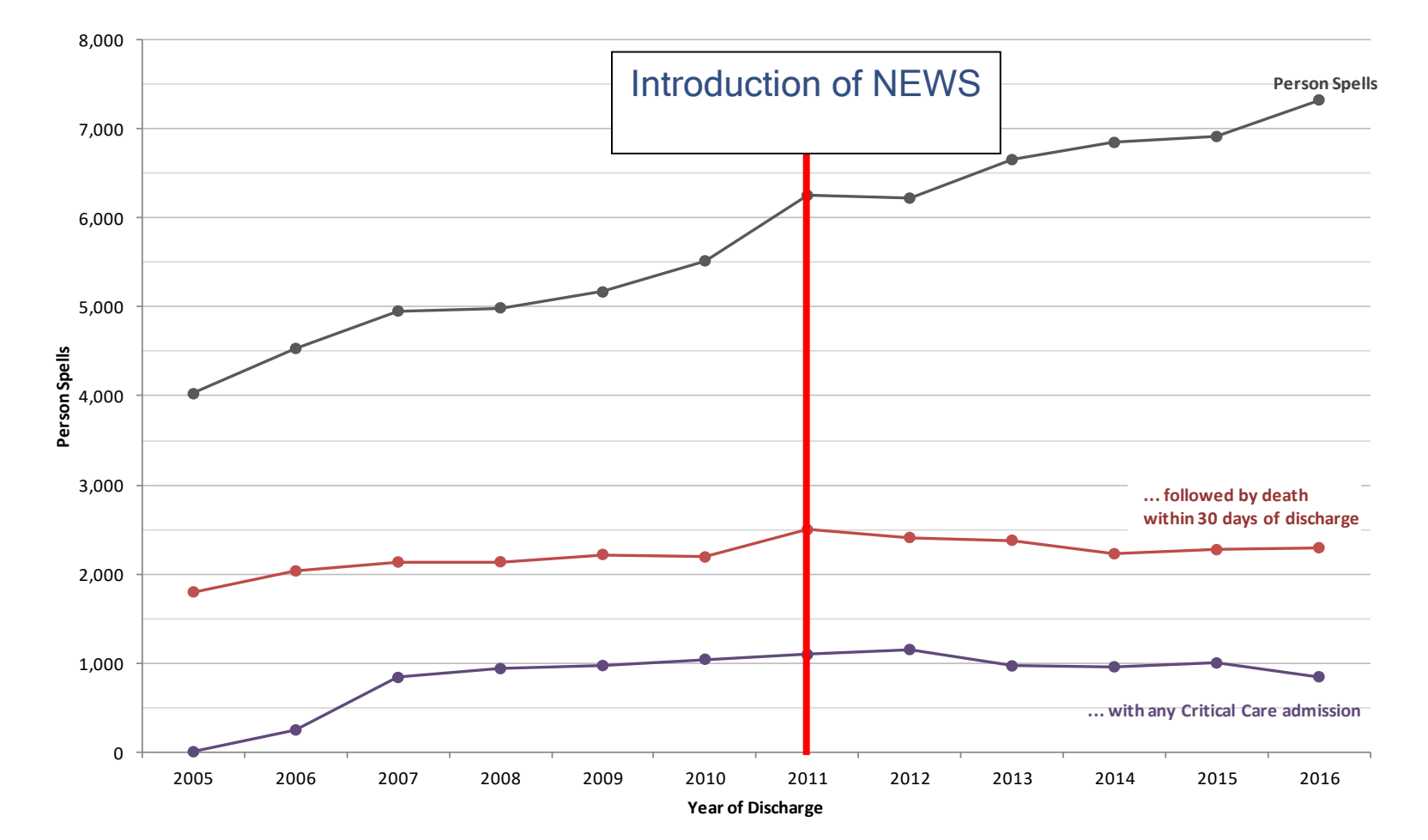


Rollout of NEWS

2013 – 18 ACUTE HOSPITALS AND WELSH AMBULANCE SERVICE TRUST (WAST)

2015 – 60 ACUTE, COMMUNITY AND MENTAL HEALTH HOSPITALS, WAST AND SOME CARE HOMES

ICD10 A40/41 Sepsis codes



The Framework for Peer Review of

Acute Deterioration Services

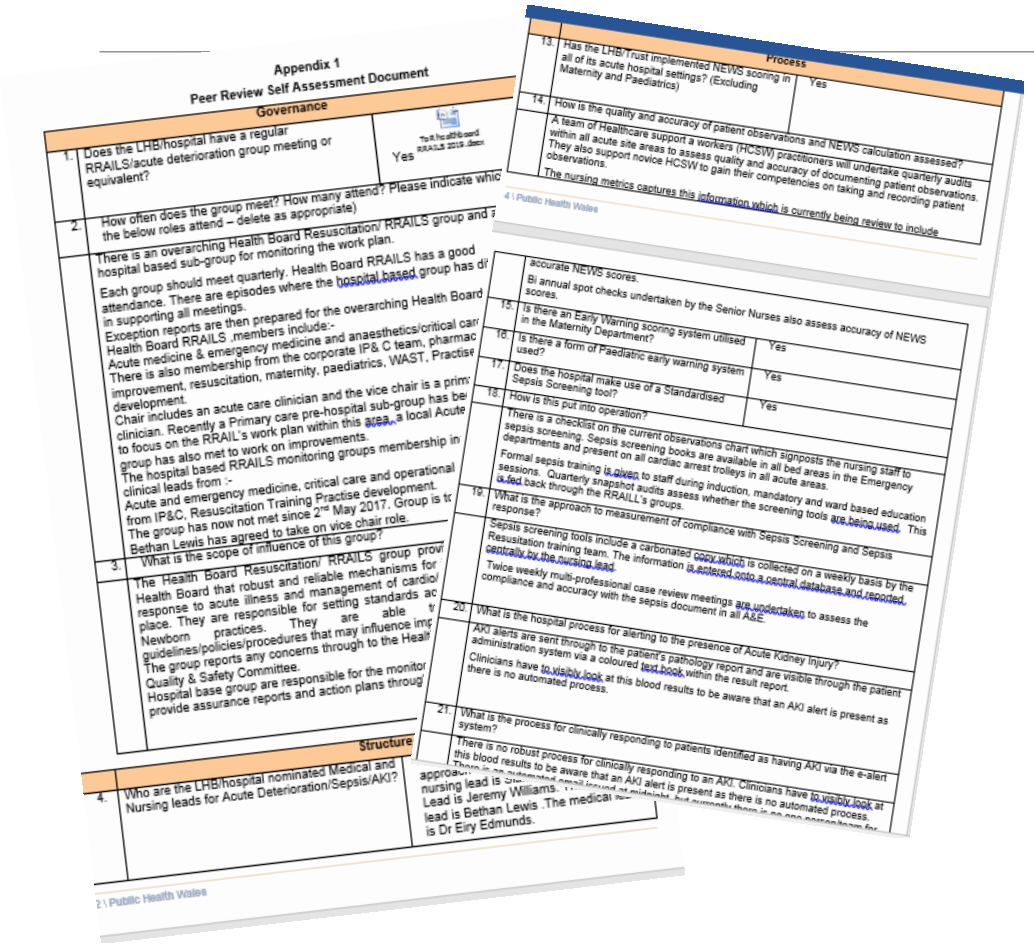
in NHS Wales

November 2017

1000 LIVES 1 O FYWYDAU

GIG CYMRU NHS WALES | Iechyd Cyhoeddus Cymru Public Health Wales

Peer Review Commissioned in 2017



Appendix 1

Peer Review Self Assessment Document

Governance

1.	Does the LHB/hospital have a regular RRAILS/acute deterioration group meeting or equivalent?	Yes
2.	How often does the group meet? How many attend? Please indicate whic the below roles attend – delete as appropriate)	
3.	What is the scope of influence of this group?	

There is an overarching Health Board Resuscitation/ RRAILS group and s hospital based sub-group for monitoring the work plan.

Each group should meet quarterly. Health Board RRAILS has a good attendance. There are episodes where the hospital based group has di in supporting all meetings.

Exception reports are then prepared for the overarching Health Board Health Board RRAILS ,members include:-

Acute medicine & emergency medicine and anaesthetics/critical car There is also membership from the corporate IP& C team, pharmac improvement, resuscitation, maternity, paediatrics, WAST, Practise development.

Chair includes an acute care clinician and the vice chair is a prim clinician. Recently a Primary care pre-hospital sub-group has be to focus on the RRAIL's work plan within this area, a local Acute group has also met to work on improvements.

The hospital based RRAILS monitoring groups membership in clinical leads from :-

Acute and emergency medicine, critical care and operational from IP&C, Resuscitation Training Practise development.

The group has now not met since 2nd May 2017. Group is t Bethan Lewis has agreed to take on vice chair role.

The Health Board Resuscitation/ RRAILS group provi Health Board that robust and reliable mechanisms for response to acute illness and management of cardio place. They are responsible for setting standards ac Newborn practices. They are able t guidelines/policies/procedures that may influence imp The group reports any concerns through to the Healt Quality & Safety Committee.

Hospital base group are responsible for the monitor provide assurance reports and action plans throug

Structure

4.	Who are the LHB/hospital nominated Medical and Nursing leads for Acute Deterioration/Sepsis/AKI?	

Process

13.	Has the LHB/Trust implemented NEWS scoring in all of its acute hospital settings? (Excluding Maternity and Paediatrics)	Yes
14.	How is the quality and accuracy of patient observations and NEWS calculation assessed?	

A team of Healthcare support a workers (HCSW) practitioners will undertake quarterly audits within all acute site areas to assess quality and accuracy of documenting patient observations. They also support novice HCSW to gain their competencies on taking and recording patient observations.

The nursing metrics captures this information which is currently being review to include

4 \ Public Health Wales

accurate NEWS scores.

Bi annual spot checks undertaken by the Senior Nurses also assess accuracy of NEWS scores.

15.	Is there an Early Warning scoring system utilised in the Maternity Department?	Yes
16.	Is there a form of Paediatric early warning system used?	Yes
17.	Does the hospital make use of a Standardised Sepsis Screening tool?	Yes
18.	How is this put into operation?	

There is a checklist on the current observations chart which signposts the nursing staff to sepsis screening. Sepsis screening books are available in all bed areas in the Emergency departments and present on all cardiac arrest trolleys in all acute areas.

Formal sepsis training is given to staff during induction, mandatory and ward based education sessions. Quarterly snapshot audits assess whether the screening tools are being used. This is fed back through the RRAILL's groups.

19.	What is the approach to measurement of compliance with Sepsis Screening and Sepsis response?	

Sepsis screening tools include a carbonated copy which is collected on a weekly basis by the Resuscitation training team. The information is entered onto a central database and reported centrally by the nursing lead.

Twice weekly multi-professional case review meetings are undertaken to assess the compliance and accuracy with the sepsis document in all A&E.

20.	What is the hospital process for alerting to the presence of Acute Kidney Injury?	

AKI alerts are sent through to the patient's pathology report and are visible through the patient administration system via a coloured test book within the result report.

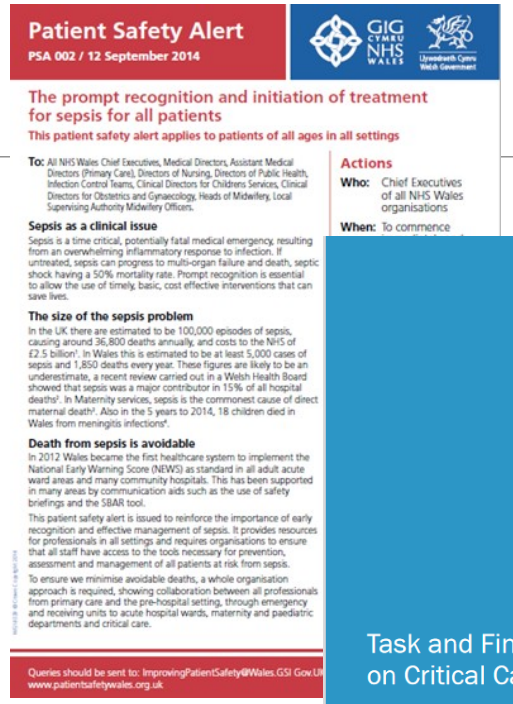
Clinicians have to visibly look at this blood results to be aware that an AKI alert is present as there is no automated process.

21.	What is the process for clinically responding to patients identified as having AKI via the e-alert system?	

There is no robust process for clinically responding to an AKI. Clinicians have to visibly look at this blood results to be aware that an AKI alert is present as there is no automated process.

Lead is Jeremy Williams. The medical lead is Bethan Lewis .The medical is Dr Eiry Edmunds.

2 \ Public Health Wales



Patient Safety Alert

PSA 002 / 12 September 2014

GIG CYMRU NHS WALES

Llywodraeth Cymru Welsh Government

The prompt recognition and initiation of treatment for sepsis for all patients

This patient safety alert applies to patients of all ages in all settings

To: All NHS Wales Chief Executives, Medical Directors, Assistant Medical Directors (Primary Care), Directors of Nursing, Directors of Public Health, Infection Control Teams, Clinical Directors for Childrens Services, Clinical Directors for Obstetrics and Gynaecology, Heads of Midwifery, Local Supervising Authority Midwifery Officers.

Actions

Who: Chief Executives of all NHS Wales organisations

When: To commence

Sepsis as a clinical issue

Sepsis is a time critical, potentially fatal medical emergency, resulting from an overwhelming inflammatory response to infection. If untreated, sepsis can progress to multi-organ failure and death, septic shock having a 50% mortality rate. Prompt recognition is essential to allow the use of timely, basic, cost effective interventions that can save lives.

The size of the sepsis problem

In the UK there are estimated to be 100,000 episodes of sepsis, causing around 36,800 deaths annually, and costs to the NHS of £2.5 billion[1]. In Wales this is estimated to be at least 5,000 cases of sepsis and 1,850 deaths every year. These figures are likely to be an underestimate, a recent review carried out in a Welsh Health Board showed that sepsis was a major contributor in 15% of all hospital deaths[2]. In Maternity services, sepsis is the commonest cause of direct maternal death[3]. Also in the 5 years to 2014, 18 children died in Wales from meningitis infections[4].

Death from sepsis is avoidable

In 2012 Wales became the first healthcare system to implement the National Early Warning Score (NEWS) as standard in all adult acute ward areas and many community hospitals. This has been supported in many areas by communication aids such as the use of safety briefings and the SBAR tool.

This patient safety alert is issued to reinforce the importance of early recognition and effective management of sepsis. It provides resources for professionals in all settings and requires organisations to ensure that all staff have access to the tools necessary for prevention, assessment and management of all patients at risk from sepsis.

To ensure we minimise avoidable deaths, a whole organisation approach is required, showing collaboration between all professionals from primary care and the pre-hospital setting, through emergency and receiving units to acute hospital wards, maternity and paediatric departments and critical care.

Queries should be sent to: ImprovingPatientSafety@Wales.GSI.Gov.U
www.patientsafetywales.org.uk

Llywodraeth Cymru
Welsh Government

Task and Finish Group on Critical Care

Final Report

July 2019

Peer Review of Acute Deterioration Services in NHS Wales

2017-2019

- Governance
- Structures
- Processes/procedures
- Outcomes/measures
- Training/education

Themed recommendations from Action Plans

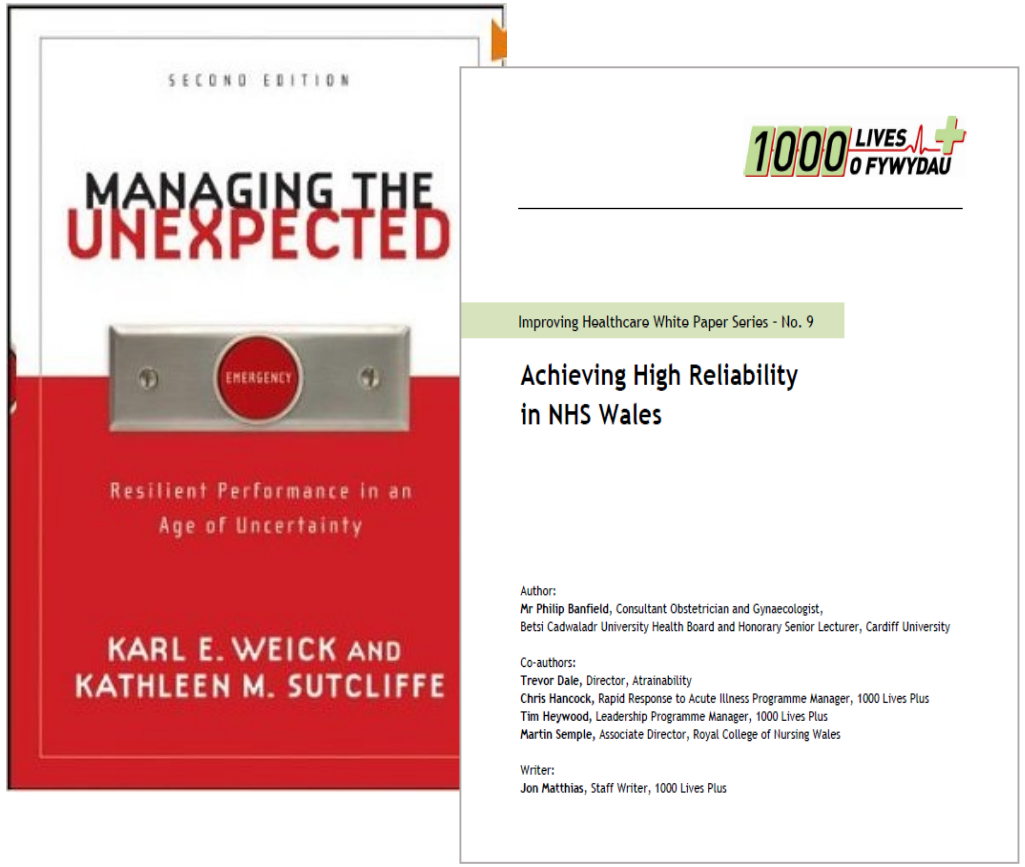
Governance

The Health Board should establish an overarching Acute Deterioration Steering Group chaired by a senior leader and incorporating, where appropriate, the existing Resuscitation Committee.

Identify an operational lead for acute deterioration within each organisation, ideally with protected time for the role.

Weick's Characteristics of High Reliability Organisations

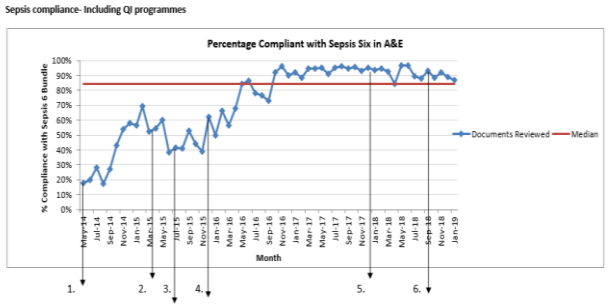
- Sensitivity to operations
- Preoccupation with failure
- Reluctance to simplify
- Commitment to resilience
- Deference to expertise



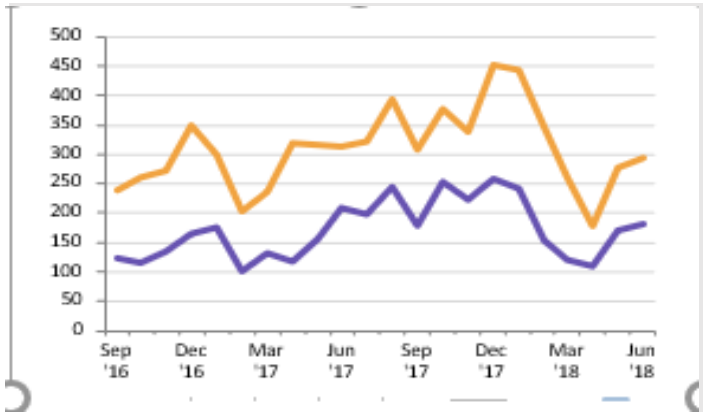
Sensitivity to operations – the same metric should be understood by all levels of the organisation

Sepsis 6 bundle compliance within 1 hour

Ward



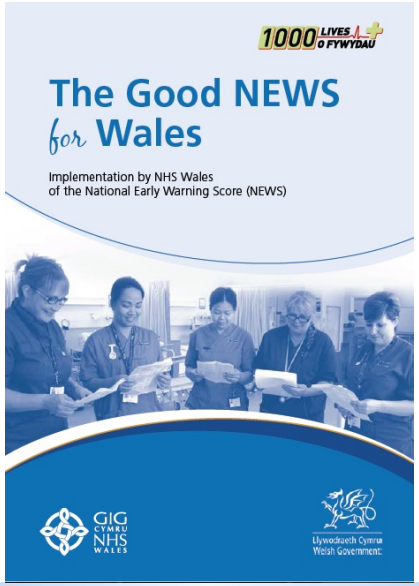
Board



Government

National Early Warning Score (NEWS) – a common language

- NEWS detects - the best (non-electronic) predictor of acute deterioration and death
- NEWS protects - prompts and guides planning for care nearer to home avoiding inappropriate treatment
- NEWS connects - a common language that promotes communication between many different care settings



Physiological Parameters		3	2	1	0	1	2	3
A B	Respiratory rate (bpm)	≤8		9-11	12-20		21-24	≥25
	O2 Saturations (%)	≤91	92-93	94-95	≥96			
	Any supplemental Oxygen		Yes		None			
C	Systolic BP (mmHg)	≤90	91-100	101-110	111-219			≥220
	Pulse (bpm)	≤40		41-50	51-90	91-110	111-130	≥131
D	AVPU score				Alert			VPU
E	Temperature (°C)	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

Concern about a patient should lead to escalation, regardless of the score.

supplied by www.jpds.co.uk

Structures

Establish a 24/7 Rapid Response System (RRS) featuring a Critical Care Outreach, Rapid Response or Acute Intervention team that complies with the principles laid out in the Task and Finish Group on Critical Care Final Report.

Ensure whole hospital daily ‘huddles’ and ward shift handover explicitly feature information on patients at risk of deterioration and generate data to demonstrate the burden of AD.

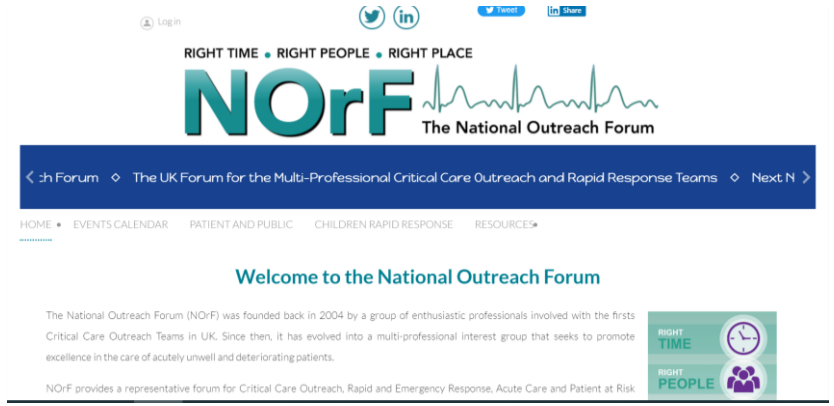
Critical Care Outreach Team (CCOT) – The Patient Safety Engine of the Hospital

The Critical Care Outreach/ Acute Intervention/ Rapid Response Team perform many roles

- Change agents
- Educators
- Researchers
- Data collectors and analysts
- Patient advocates
- Liaison between acute and critical care etc …

Welsh Outreach Forum (WOrF)

“Is CCOT necessary when the system is running well”

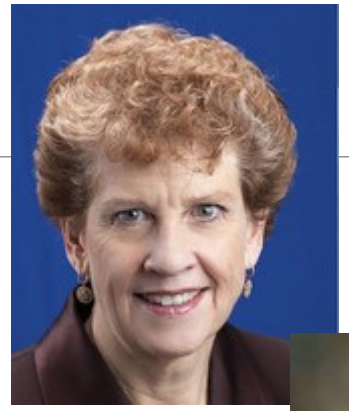


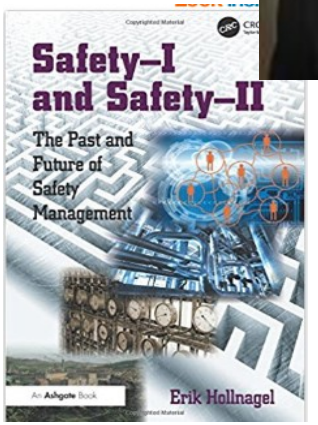
Processes

Health Board Acute Deterioration Steering Group should agree, publicise and monitor compliance with Standard Operating Procedures (SOPs) for escalation and treatment of acute deterioration, sepsis and acute kidney injury (AKI)

Reliability and Safety II

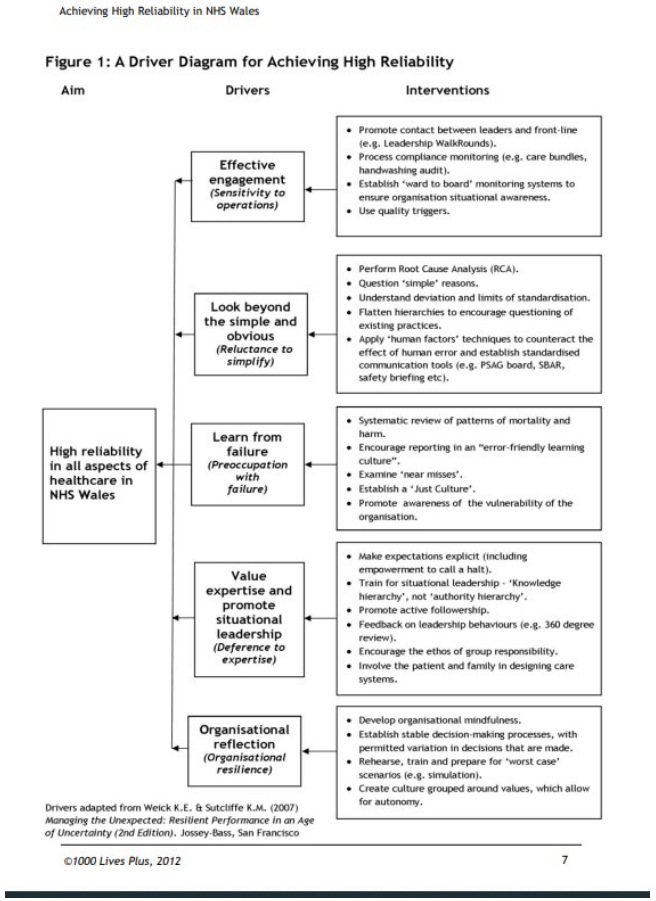
- The defect rate in technical quality of American health care is approximately 45% (McGlynn, 2003)
- The gap between perception and practice is what we think we do versus what we actually do (Mitchell Levy, Director, Surviving Sepsis Campaign)
- “Safety management should .... move from ensuring that ‘as few things as possible go wrong’ to ensuring that ‘as many things as possible go right’” (Hollnagel et al. 2015)





Care Bundles/ SOPs

- Give ‘permission to act’
- Ensure consistent delivery of evidence based interventions
- Process reliability
- Means of demonstrating improvement
- Assurance on quality of care



Achieving High Reliability in NHS Wales

Figure 1: A Driver Diagram for Achieving High Reliability

Aim	Drivers	Interventions
High reliability in all aspects of healthcare in NHS Wales	Effective engagement *(Sensitivity to operations)*	• Promote contact between leaders and front-line (e.g. Leadership WalkRounds). • Process compliance monitoring (e.g. care bundles, handwashing audit). • Establish ‘ward to board’ monitoring systems to ensure organisation situational awareness. • Use quality triggers.
	Look beyond the simple and obvious *(Reluctance to simplify)*	• Perform Root Cause Analysis (RCA). • Question ‘simple’ reasons. • Understand deviation and limits of standardisation. • Flatten hierarchies to encourage questioning of existing practices. • Apply ‘human factors’ techniques to counteract the effect of human error and establish standardised communication tools (e.g. PSAG board, SBAR, safety briefing etc).
	Learn from failure *(Preoccupation with failure)*	• Systematic review of patterns of mortality and harm. • Encourage reporting in an “error-friendly learning culture”. • Examine ‘near misses’. • Establish a ‘Just Culture’. • Promote awareness of the vulnerability of the organisation.
	Value expertise and promote situational leadership *(Deference to expertise)*	• Make expectations explicit (including empowerment to call a halt). • Train for situational leadership - ‘Knowledge hierarchy’, not ‘authority hierarchy’. • Promote active followership. • Feedback on leadership behaviours (e.g. 360 degree review). • Encourage the ethos of group responsibility. • Involve the patient and family in designing care systems.
	Organisational reflection *(Organisational resilience)*	• Develop organisational mindfulness. • Establish stable decision-making processes, with permitted variation in decisions that are made. • Rehearse, train and prepare for ‘worst case’ scenarios (e.g. simulation). • Create culture grouped around values, which allow for autonomy.

Drivers adapted from Weick K.E. & Sutcliffe K.M. (2007) *Managing the Unexpected: Resilient Performance in an Age of Uncertainty (2nd Edition)*. Jossey-Bass, San Francisco

Outcomes

- Establish and regularly review at a hospital and Health Board level, a standard dashboard of acute deterioration metrics including:
  - information on sepsis and AKI incidence and treatment
  - resuscitation events
  - CCOT referrals
  - sepsis registry data
  - suspicion of sepsis (SoS) outcomes.
- This can be facilitated by the operational lead for acute deterioration and ideally should remain a standing agenda item on senior leadership meetings.

The ‘Dark Matter of Harm’

Like Dark Matter, the majority of what causes harm in healthcare is hidden because it is difficult to measure:

Infection

Sepsis

AKI

Measure the right thing

RESUSCITATION 141 (2019) 1–12

Available online at www.sciencedirect.com

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Statement paper

Quality metrics for the evaluation of Rapid Response Systems: Proceedings from the third international consensus conference on Rapid Response Systems

Christian P. Subbe[a,], Jonathan Bannard-Smith[o], Jacinda Bunch[v], Ratapum Champunot[u], Michael A. DeVita[b], Lesley Durham[c], Dana P. Edelson[d], Isabel Gonzalez[t], Christopher Hancock[e], Rashan Haniffa[p], Jillian Hartin[f], Helen Haskell[g], Helen Hogan[h], Darly A. Jones[n], Cor J. Kalkman[s], Geoffrey K. Lighthall[i], James Malycha[q], Melody Z. Ni[j], Alison V. Phillips[k], Francesca Rubulotta[r], Ralph K. So[l], John Welch[m], on behalf of the International Society for Rapid Response Systems*

Training/education

Embed standardised national training on AD, sepsis and AKI in all clinical education and consider making ‘RRAILS Online’ e-learning modules mandatory.

In teams

Simulation

Real world events

The system is far larger than the hospital - Community NEWS

NEWS in Your Community

The NEWS tool embodies the values championed by 'A Healthier Wales', **predicting acute deterioration** and facilitating early intervention to reduce mortality. The tool is evidence driven and of high value, as it reduces harm and variation, as well as being scalable and allowing **seamless transition between care settings and providers.**

NEWS is an empowering tool, which gives a voice to people receiving care in the community, as well as care providers, enabling a personalised approach that **maintains safety and reduces risk.**

Visit the RRAILS (Rapid Response to Acute Illness Learning Set) website for more information and updates:

www.1000livesplus.wales.nhs.uk/rrails

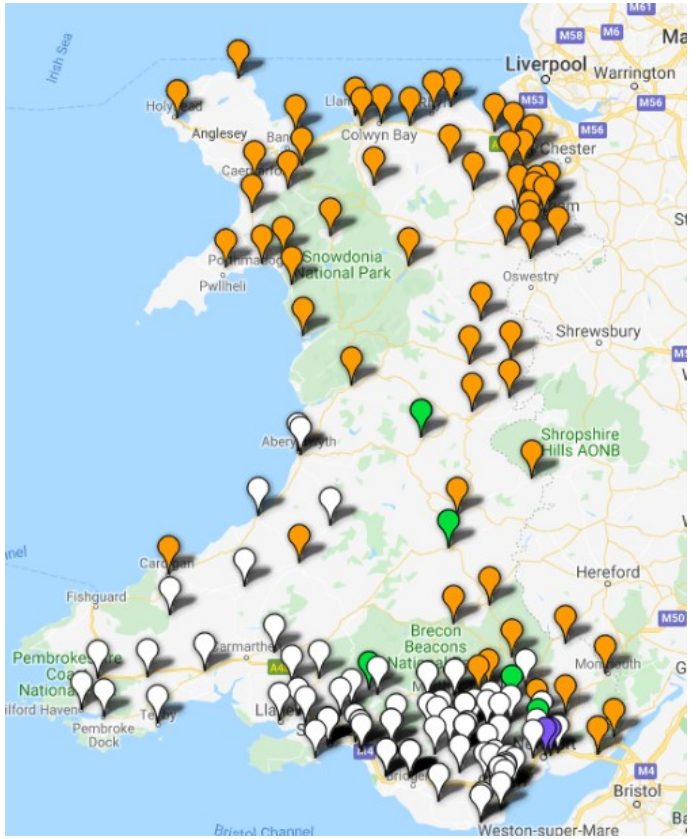
See the 'Out of Hospital' section for resources on sepsis detection in non-acute settings.

Join the conversation: #NEWSInYourCommunity

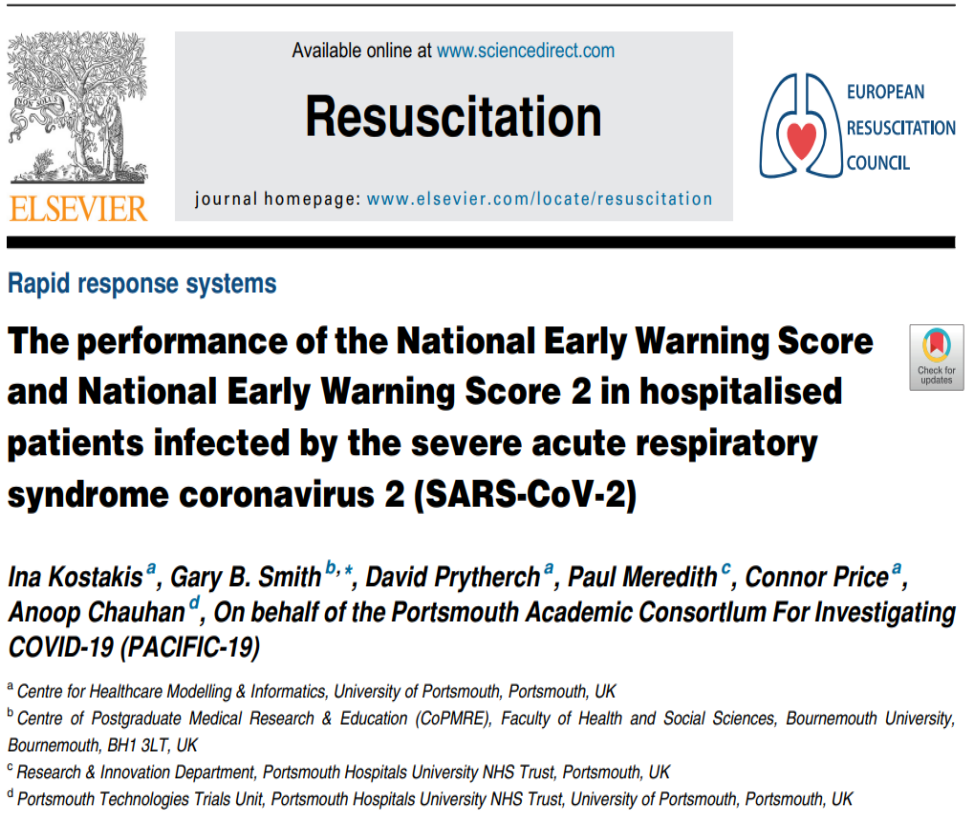
Ymunwch â'r sgwrs: #NEWSYnEichCymuned

1000 LIVES 0 FYWYDAU

GIG CYMRU NHS WALES



- Amendments to NEWS or NEWS2, such as the addition of new covariates or the need to change the weighting of existing parameters, are unnecessary when evaluating patients with COVID-19.
- Results support the national and international recommendations for the use of NEWS or NEWS2 for the assessment of acute-illness severity in patients with COVID-19.
- Community NEWS and COVID-19



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Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

EUROPEAN RESUSCITATION COUNCIL

Rapid response systems

The performance of the National Early Warning Score and National Early Warning Score 2 in hospitalised patients infected by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

Ina Kostakis[a], Gary B. Smith[b,], David Prytherch[a], Paul Meredith[c], Connor Price[a], Anoop Chauhan[d], On behalf of the Portsmouth Academic Consortium For Investigating COVID-19 (PACIFIC-19)*

[a] *Centre for Healthcare Modelling & Informatics, University of Portsmouth, Portsmouth, UK*
[b] *Centre of Postgraduate Medical Research & Education (CoPMRE), Faculty of Health and Social Sciences, Bournemouth University, Bournemouth, BH1 3LT, UK*
[c] *Research & Innovation Department, Portsmouth Hospitals University NHS Trust, Portsmouth, UK*
[d] *Portsmouth Technologies Trials Unit, Portsmouth Hospitals University NHS Trust, University of Portsmouth, Portsmouth, UK*

Surely we all have the right to save our own lives? Even in hospital – Alison Phillips

UK ‘Worry and concern’ group

Welsh Outreach Forum (WOrF) standardised minimum data set

Conclusion

- Acute deterioration exists within a complex system
- Peer review of AD systems against agreed standards drives improvement
- Sensitivity to operations – use 1 language throughout the system
- The Critical Care Outreach Team is the ‘patient safety engine of the hospital’
- Care bundles/ SOPs give ‘permission to act’, drive process reliability and improve quality of care
- The ‘dark matter’ of harm – measure what is important
- Train in teams for ‘real world’ scenarios
- The ‘system’ is far larger than the hospital
- Make safety ‘patient powered’