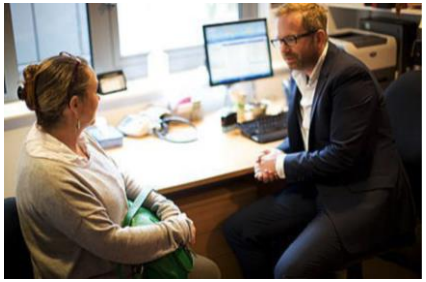
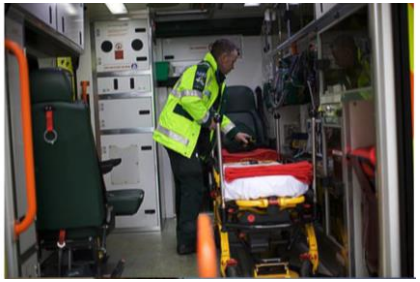
Oxford Academic Health Science Network

PATIENT SAFETY

From confusion to consensus:

The Oxford AHSN Sepsis Pathway

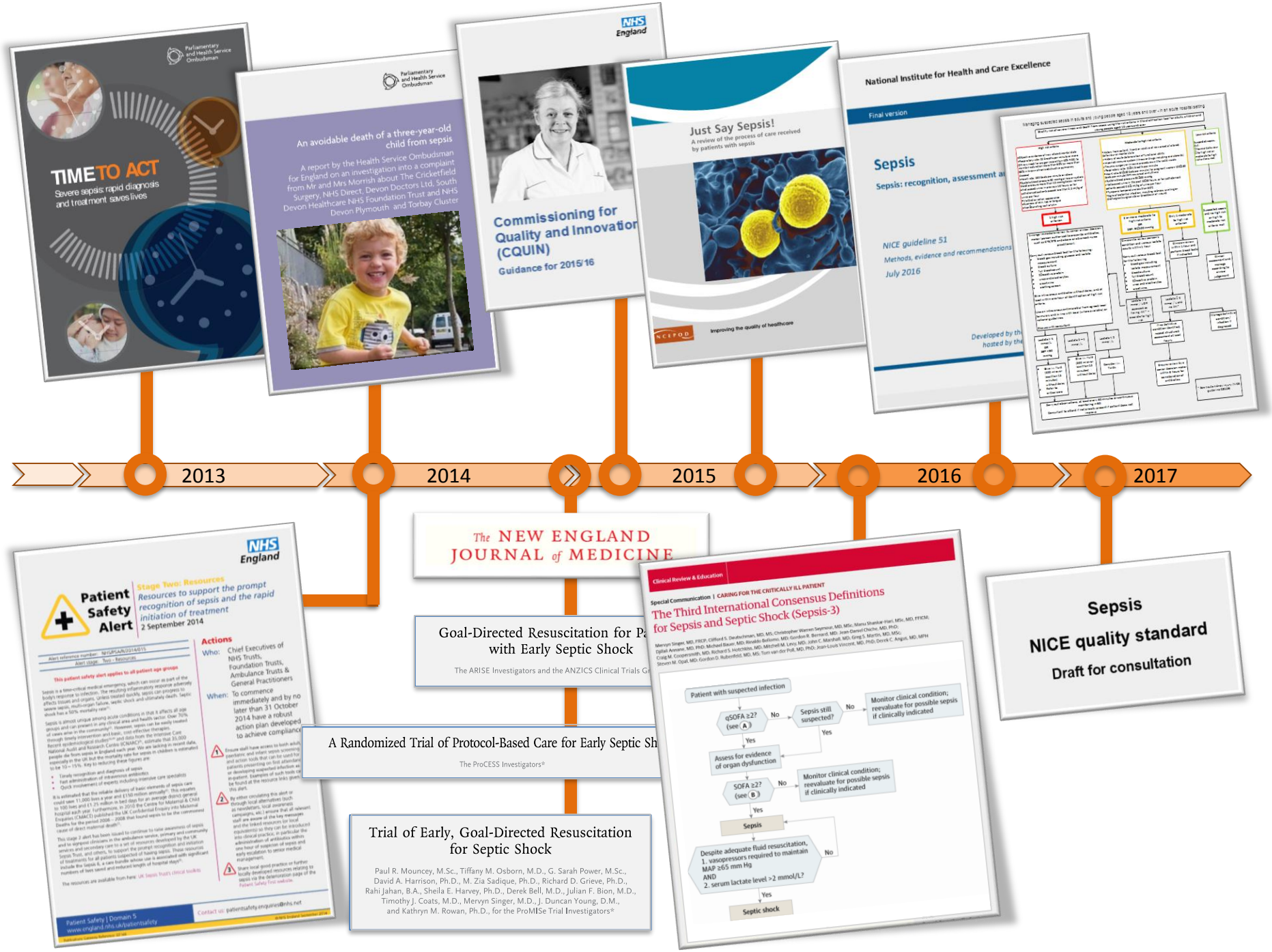


Andrew Brent

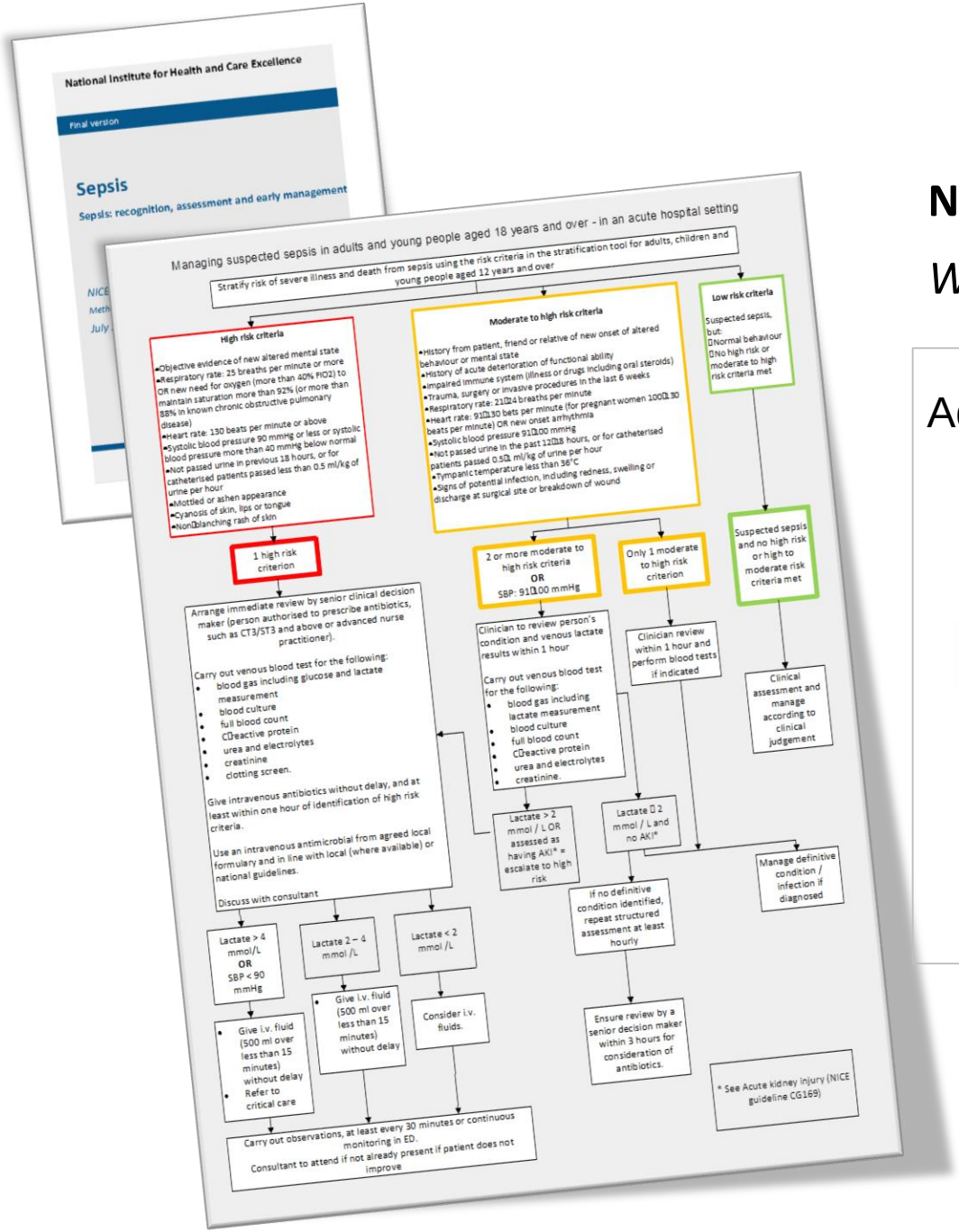
Sepsis Clinical Lead, Oxford AHSN

& Oxford University Hospitals NHS Foundation Trust


Parliamentary and Health Service Ombudsman
TIME TO ACT
Severe sepsis: rapid diagnosis and treatment saves lives
Parliamentary and Health Service Ombudsman
An avoidable death of a three-year-old child from sepsis
A report by the Health Service Ombudsman for England on an investigation into a complaint from Mr and Mrs Morrish about The Cricketfield Surgery, NHS Direct, Devon Doctors Ltd, South Devon Healthcare NHS Foundation Trust and NHS Devon Plymouth and Torbay Cluster
NHS England
Commissioning for Quality and Innovation (CQUIN)
Guidance for 2015/16
Just Say Sepsis!
A review of the process of care received by patients with sepsis
NCEPOD
Improving the quality of healthcare
National Institute for Health and Care Excellence
Final version
Sepsis
Sepsis: recognition, assessment a
NICE guideline 51
Methods, evidence and recommendations
July 2016
Developed by th
hosted by the
2013
2014
2015
2016
2017
NHS England
Patient Safety Alert
Stage Two: Resources
Resources to support the prompt recognition of sepsis and the rapid initiation of treatment
2 September 2014
Actions
Who: Chief Executives of NHS Trusts, Foundation Trusts, Ambulance Trusts & General Practitioners
When: To commence immediately and by no later than 31 October 2014 have a robust action plan developed to achieve compliance
Patient Safety | Domain 5
www.england.nhs.uk/patientsafety
The NEW ENGLAND JOURNAL of MEDICINE
Goal-Directed Resuscitation for Pa
with Early Septic Shock
The ARISE Investigators and the ANZICS Clinical Trials Gr
A Randomized Trial of Protocol-Based Care for Early Septic Sh
The ProCESS Investigators*
Trial of Early, Goal-Directed Resuscitation for Septic Shock
Paul R. Mouncey, M.Sc., Tiffany M. Osborn, M.D., G. Sarah Power, M.Sc., David A. Harrison, Ph.D., M. Zia Sadique, Ph.D., Richard D. Grieve, Ph.D., Rahi Jahan, B.A., Sheila E. Harvey, Ph.D., Derek Bell, M.D., Julian F. Bion, M.D., Timothy J. Coats, M.D., Mervyn Singer, M.D., J. Duncan Young, D.M., and Kathryn M. Rowan, Ph.D., for the ProMISe Trial Investigators*
Clinical Review & Education
Special Communication | CARING FOR THE CRITICALLY ILL PATIENT
The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)
Patient with suspected infection
qSOFA ≥2? (see A)
Sepsis still suspected?
Monitor clinical condition; reevaluate for possible sepsis if clinically indicated
Assess for evidence of organ dysfunction
SOFA ≥2? (see B)
Sepsis
Despite adequate fluid resuscitation, 1. vasopressors required to maintain MAP ≥65 mm Hg AND 2. serum lactate level >2 mmol/L?
Septic shock
Sepsis
NICE quality standard
Draft for consultation

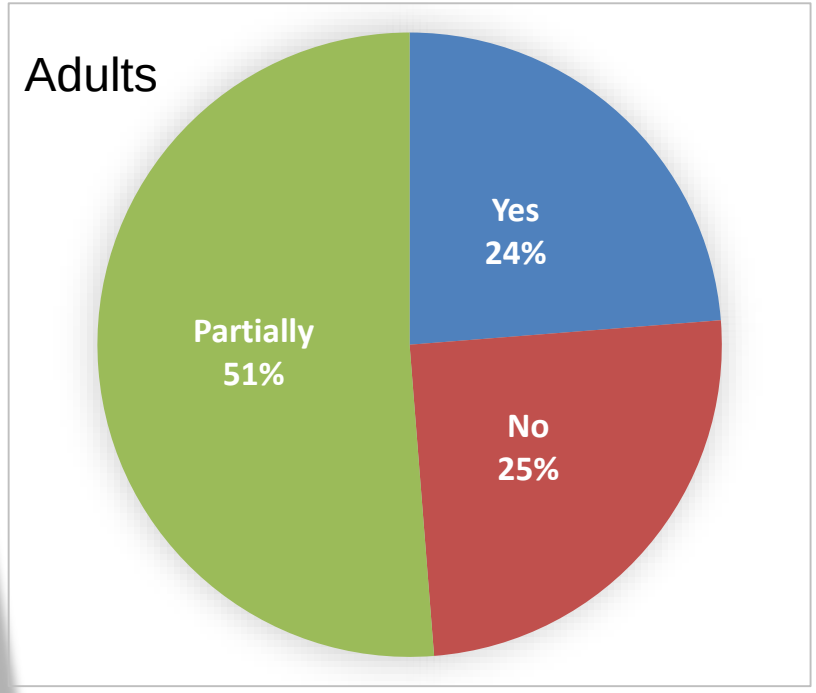
Oxford AHSN Sepsis Group Aims

- Share experience of QI initiatives
- Share resources (e.g. for training)
- Share data (process & outcome; combine to max learning)
- Joint QI projects (± research)
- **Collaboratively review & apply guidelines**



National Sepsis Stakeholder Audit

Will you be implementing NICE?



82 respondents
>50 acute Trusts

Oxford AHSN approach

- Regional approach to implementation

- Integrate into existing pathways
  - Community
  - Acute admissions
  - Deteriorating patients (Track & Trigger / Early Warning Scores)

- Build on progress already made
  - ‘Red Flag’ Sepsis
  - Sepsis Six
  - Neutropaenic Sepsis

THINK SEPSIS

Person with possible infection

- Think ***'could this be sepsis?'*** if they present with signs or symptoms that indicate infection, even if they do not have a high temperature.
- Be aware that people with sepsis may have non-specific, non-localising presentations (for example, feeling very unwell.
- Pay particular attention to concerns expressed by the person and family/carer.
- Take particular care in the assessment of people who might have sepsis who are unable, or their parent/carer is unable, to give a good history (for example, young children, people with English as a second language, people with communication problems)

ASSESSMENT

Assess people with suspected infection to identify:

- likely source of infection
- risk factors **(see righthand box)**
- Indicators of clinical of concern such as abnormalities of behaviour, circulation or respiration.

Healthcare professionals performing a remote assessment of a person with suspected infection should seek to identify factors that increase risk of sepsis or indicators of clinical concern.

People more vulnerable to sepsis

- the very young (under 1 year) and older people (over 75 years) or very frail people
- recent trauma or surgery or invasive procedure (within the last 6 weeks)
- Impaired immunity due to illness or drugs (for example, people receiving steroids, chemotherapy or immunosuppressants)
- Indwelling lines / catheters / intravenous drug misusers, any breach of skin integrity (for example, any cuts, burns, blisters or skin infections).

If at risk of neutropenic sepsis - refer to secondary care

Additional risk factors for women who are pregnant or who have been pregnant, given birth, had a termination or miscarriage within the past 6 weeks -gestational diabetes, diabetes or other co-morbidities; needed invasive procedure such as caesarean section, forceps delivery, removal of retained products of conception, prolonged rupture of membranes, close contract with someone with group A streptococcal infection, have continued vaginal bleeding or an offensive vaginal discharge).

Consider RISK FACTORS & Indicators of CLINICAL CONCERN

Structured Assessment:

Observations &
Early Warning Scores

SUSPECT SEPSIS

If sepsis is suspected, use a structured set of observations to assess people in a face-to-face setting.
Consider using early warning scores in hospital settings.
Parental or carer concern is important and should be acknowledged.

THE UK SEPSIS TRUST

The College of Emergency Medicine

NICE High Risk ≈ Red Flag Sepsis

Infection *plus*:

- **HR** > 130
- **SBP** < 90 (MAP <65; ↓SBP >40)
- **RR** > 25
- **SaO_2** < 91%
- **Lactate** > 2
- **New altered mental state**
- **Purpuric rash, mottled/ashen, or cyanosed** ← **new** (NICE 2016)
- **Poor urine output** (not passed urine >18h or <0.5ml/kg/hr) ←

Sepsis 6 Saves Lives

Care Bundle

- **IV Antibiotics**
  - Pre-alert secondary care if high risk / red flag sepsis
  - Mechanism for delivery pre-hospital if >1h transfer
  - BenPen pre-hospital for suspected meningococcal disease
- **IV Fluids** - guided by need / lactate
- **Consider Oxygen** - target SaO_2 94-98% (88-92% if risk of T2RF)
- **Blood cultures**
- **Lactate**
- **Monitoring** (**urine output**)
- **Source Identification & Control**
- **Escalation criteria**

Sepsis Six

Oxford Academic Health Science Network

Oxford AHSN Regional pathway

Stratify risk of severe illness and death from sepsis using the risk criteria in the stratification tool for adults, children and young people aged 12 years and over

High risk criteria

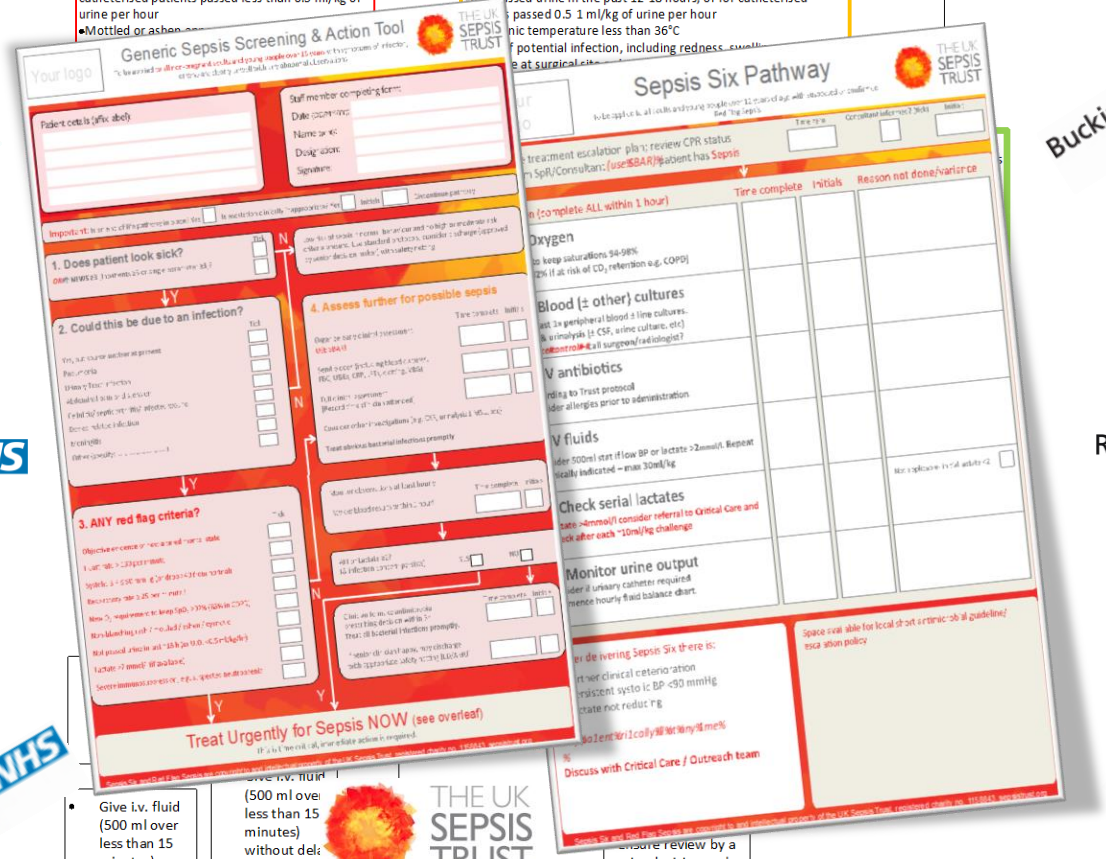
- Objective evidence of new altered mental state
- Respiratory rate: 25 breaths per minute or more OR new need for oxygen (more than 40% FiO2) to maintain saturation more than 92% (or more than 88% in known chronic obstructive pulmonary disease)
- Heart rate: 130 beats per minute or above
- Systolic blood pressure 90 mmHg or less or systolic blood pressure more than 40 mmHg below normal
- Not passed urine in previous 18 hours, or for catheterised patients passed less than 0.5 ml/kg of urine per hour
- Mottled or ashen

Moderate to high risk criteria

- History from patient, friend or relative of new onset of altered behaviour or mental state
- History of acute deterioration of functional ability
- Impaired immune system (illness or drugs including oral steroids)
- Trauma, surgery or invasive procedures in the last 6 weeks
- Respiratory rate: 21-24 breaths per minute
- Heart rate: 91 130 bets per minute (for pregnant women 100 130 beats per minute) OR new onset arrhythmia
- Systolic blood pressure 91-100 mmHg
- Not passed urine in the past 12-18 hours, or for catheterised passed 0.5 1 ml/kg of urine per hour
- nic temperature less than 36°C
- f potential infection, including redness, swell
- e at surgical site

Low risk criteria

Suspected sepsis, but:
- Normal behaviour
- No high risk or moderate to high risk criteria met



- Give i.v. fluid (500 ml over less than 15 minutes) without delay
- Refer to critical care

Give i.v. fluid (500 ml over less than 15 minutes) without dela

Ensure review by a senior decision maker within 3 hours for consideration of antibiotics.

Carry out observations, at least every 30 minutes or continuous monitoring in ED.
Consultant to attend if not already present if patient does not improve

* See Acute kidney injury (NICE guideline CG169)

THE UK SEPSIS TRUST

Oxford University Hospitals NHS Trust

Buckinghamshire Healthcare NHS Trust

Heatherwood and Wexham Park Hospitals NHS Foundation Trust

Royal Berkshire NHS Foundation Trust

Milton Keynes University Hospital NHS Foundation Trust

Great Western Hospitals NHS Foundation Trust

Oxford AHSN Version

minor wording changes

simplified escalation criteria

Your logo

Sepsis Six Pathway

To be applied to all adults and young people over 12 years of age with suspected or confirmed Red Flag Sepsis

THE UK SEPSIS TRUST

	Time zero	Consultant informed? (tick)	Initials
Make treatment escalation plan; review CPR status Inform SpR/Consultant *(use%BAR)%*atient has Sepsis			

Action (complete ALL within 1 hour)	Time complete	Initials	Reason not done/variance
1. Oxygen Aim to keep saturations 94-98% (88-92% if at risk of CO_2 retention e.g. COPD)			
2. Blood (± other) cultures At least 1x peripheral blood ± line cultures. CXR & urinalysis (± CSF, urine culture, etc) *Source#ontrol#-#*all surgeon/radiologist?			
3. IV antibiotics According to Trust protocol Consider allergies prior to administration.			
4. IV fluids Consider 500ml stat if low BP or lactate >2mmol/l. Repeat if clinically indicated – max 30ml/kg			
5. Check serial lactates If lactate >4mmol/l consider referral to Critical Care and recheck after each ~10ml/kg challenge			Not applicable- initial lactate <2 ☐
6. Monitor urine output Consider if urinary catheter required Commence hourly fluid balance chart.			

If after delivering Sepsis Six there is:

- further clinical deterioration
- persistent systolic BP <90 mmHg
- lactate not reducing

or%%%a1ent%ri1cally%l%at%any%1me%
%

Discuss with Critical Care / Outreach team

Space available for local short antimicrobial guideline/ escalation policy

Oxford AHSN Version 1

Early Warning Score

Simplified Amber criteria

Your logo

Generic Sepsis Screening & Action Tool

To be applied to all non-pregnant adults and young people over 16 years with symptoms of infection, or who are clearly unwell with any abnormal observations

THE UK SEPSIS TRUST

Patient details (affix label):

Staff member completing form:

Date (DD/MM/YY):

Name (print):

Designation:

Signature:

Important: *Is an end of life pathway in place? Yes* ☐ *Is escalation clinically inappropriate? Yes* ☐ *Initials* ☐ *Discontinue pathway*

1. Does patient look sick? Tick ☐

OR ↑**NEWS ≥3** [Inpatients ≥5 or single parameter ≥3] ☐

N → Low risk of sepsis if normal behaviour and no high or moderate risk criteria present. Use standard protocols, consider discharge (approved by senior decision maker) with safety netting

↓ Y

2. Could this be due to an infection? Tick

- Yes, but source unclear at present ☐
- Pneumonia ☐
- Urinary Tract Infection ☐
- Abdominal pain or distension ☐
- Cellulitis/ septic arthritis/ infected wound ☐
- Device-related infection ☐
- Meningitis ☐
- Other (specify: ……..) ☐

N

↓ Y

3. ANY red flag criteria? Tick

- Objective evidence of **new altered mental state** ☐
- **Heart rate > 130 per minute** ☐
- **Systolic B.P ≤ 90 mmHg** (or drop >40 from normal) ☐
- **Respiratory rate ≥ 25 per minute** ☐
- **New O_2 requirement** to keep SaO_2 ≥92% (88% in COPD) ☐
- **Non-blanching rash / mottled / ashen / cyanotic** ☐
- **Not passed urine in last ~18 h** (or U.O. <0.5 ml/kg/hr) ☐
- **Lactate ≥2 mmol/l** (if available) ☐
- **Severe immunosuppression**, e.g. suspected neutropaenia ☐

N

↓ Y

4. Any amber flags (other sepsis concern)? Tick

- Other risk factor(s) for severe infection[1] ☐
- Acute deterioration in functional/mental state ☐
- Systolic BP 91-100 mmHg or new arrhythmia ☐
- Hypothermia ☐
- Patient, relative or health professional remains worried ☐

[1] E.g. recent surgery; immunosuppression; oral steroids; rapidly spreading cellulitis or possible necrotizing fasciitis (Is pain out of proportion to clinical signs of cellulitis?).

[N.B. severe immunosuppression incl. neutropaenia = 'red flag']

↑ N

↓ Y

	Time complete	Initials
Send bloods *(including blood cultures, FBC, U&Es, CRP, LFTs, clotting, VBG)*		
Organize early clinical assessment *USE SBAR! Review results within 1 hour*		
Time clinician attended		

↓

AKI or Lactate ≥2? *(& infection concern persists)* YES ☐ NO ☐

↓

	Time complete	Initials
Clinician to make antimicrobial prescribing decision within 3h. ***Treat all bacterial infections promptly.***		
If senior clinician happy, may discharge with appropriate safety netting [ED/AMU]		

Y

↓ Y

Treat Urgently for Sepsis NOW (see overleaf)

This is time critical, immediate action is required.

Oxford AHSN Version 2

Your logo

Generic Sepsis Screening & Action Tool

To be applied to all non-pregnant adults and young people over 16 years with symptoms of infection, or who are clearly unwell with any abnormal observations

THE UK SEPSIS TRUST

Patient details (affix label):

Staff member completing form:
Date (DD/MM/YY):
Name (print):
Designation:
Signature:

Important: Is an end of life pathway in place? Yes ☐ Is escalation clinically inappropriate? Yes ☐ Initials ☐ Discontinue pathway

1. Does patient look sick?

Tick

OR# ↑NEWS ≥3 [Inpatients ≥5 or single parameter ≥3]?

N → Low risk of sepsis if normal behaviour and no high or moderate risk criteria present. Use standard protocols, consider discharge (approved by senior decision maker) with safety netting

↓ Y

2. Could this be due to an infection?

Tick

- Yes, but source unclear at present
- Pneumonia
- Urinary Tract Infection
- Abdominal pain or distension
- Cellulitis/ septic arthritis/ infected wound
- Device-related infection
- Meningitis
- Other (specify: .....)

N

↓ Y

3. ANY red flag criteria?

Tick

- Objective evidence of new altered mental state
- Heart rate > 130 per minute
- Systolic B.P ≤ 90 mmHg (or drop >40 from normal)
- Respiratory rate ≥ 25 per minute !
- New O_2 requirement to keep SpO_2 ≥92% (88% in COPD)
- Non-blanching rash / mottled / ashen / cyanotic
- Not passed urine in last ~18 h (or U.O. <0.5 ml/kg/hr)
- Lactate ≥2 mmol/l (if available)
- Severe immunosuppression, e.g. suspected neutropaenia

N

↓ Y

4. Assess further for possible sepsis

	Time complete	Initials
Organize early clinical assessment USE SBAR!		
Send bloods (including blood cultures, FBC, U&Es, CRP, LFTs, clotting, VBG)		
Full clinical assessment [Record time clinician attended]		

Consider other investigations (e.g. CXR, urinalysis ± MSU, etc)

Treat obvious bacterial infections promptly

↓

Monitor observations at least hourly

	Time complete	Initials
Review blood results within 1 hour!		

↓

AKI or Lactate ≥2?
(& infection concern persists) YES ☐ NO ☐

N → ↓

Y →

	Time complete	Initials
Clinician to make antimicrobial prescribing decision within 3h. **Treat all bacterial infections promptly.**		
If senior clinician happy, may discharge with appropriate safety netting [ED/AMU]		

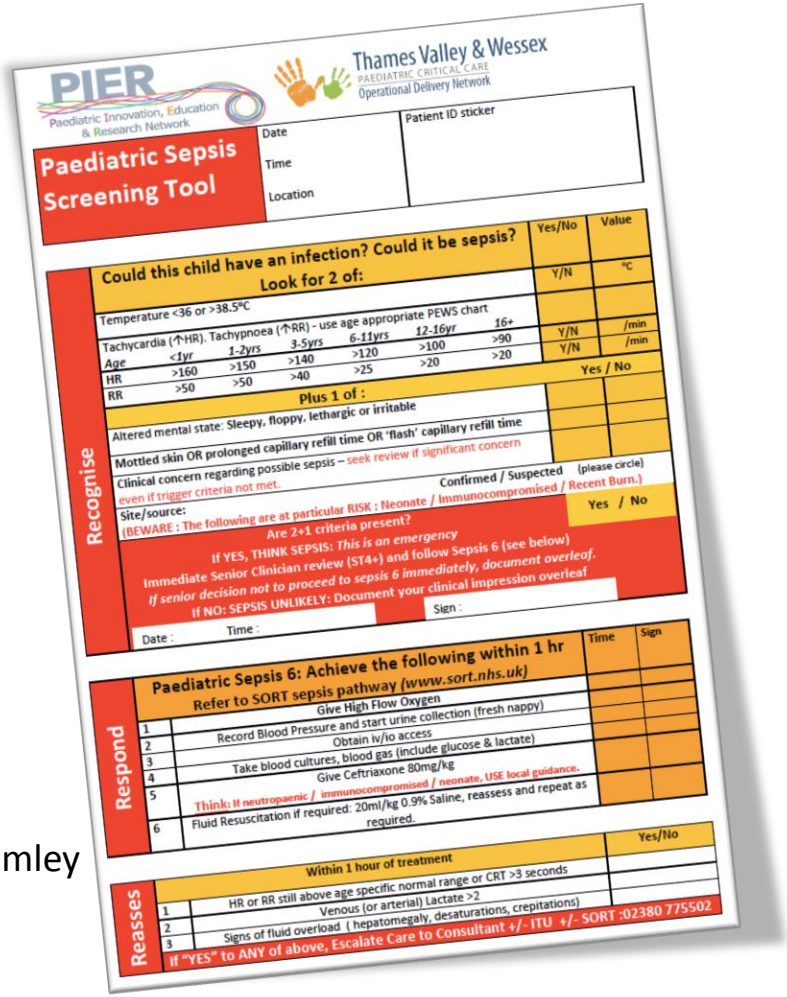
No amber criteria: assess all patients

Treat Urgently for Sepsis NOW (see overleaf)

This is time critical, immediate action is required.

Paediatric screening tool

- **Regional Collaboration**
  - Paediatric Critical Care Network (PCCN)
  - Children's Network
  - Oxford & Wessex AHSNs
- **Validated** against NICE guideline
  - Audit of 227 notes (PCCN)
  - Equally sensitive, more specific
- **Adopted by Oxford AHSN Sepsis group**
- **Implemented across Thames Valley**
  - including Oxford, Buckinghamshire, Milton Keynes, Frimley Health [Swindon agreed in principle]



PIER
Paediatric Innovation, Education & Research Network

Thames Valley & Wessex
PAEDIATRIC CRITICAL CARE
Operational Delivery Network

Paediatric Sepsis Screening Tool

Date
Time
Location

Patient ID sticker

Recognise

Could this child have an infection? Could it be sepsis? Look for 2 of:	Yes/No	Value
Temperature <36 or >38.5°C	Y/N	°C
Tachycardia (↑HR). Tachypnoea (↑RR) - use age appropriate PEWS chart		
Age: <1yr, 1-2yrs, 3-5yrs, 6-11yrs, 12-16yr, 16+		
HR: >160, >150, >140, >120, >100, >90	Y/N	/min
RR: >50, >50, >40, >25, >20, >20	Y/N	/min
Plus 1 of :	Yes / No	
Altered mental state: Sleepy, floppy, lethargic or irritable		
Mottled skin OR prolonged capillary refill time OR 'flash' capillary refill time		
Clinical concern regarding possible sepsis – seek review if significant concern even if trigger criteria not met.		

Site/source: Confirmed / Suspected (please circle)
(BEWARE : The following are at particular RISK : Neonate / Immunocompromised / Recent Burn.)

Are 2+1 criteria present? Yes / No

If YES, THINK SEPSIS: *This is an emergency*
Immediate Senior Clinician review (ST4+) and follow Sepsis 6 (see below)
If senior decision not to proceed to sepsis 6 immediately, document overleaf.
If NO: SEPSIS UNLIKELY: Document your clinical impression overleaf

Date : Time : Sign :

Respond

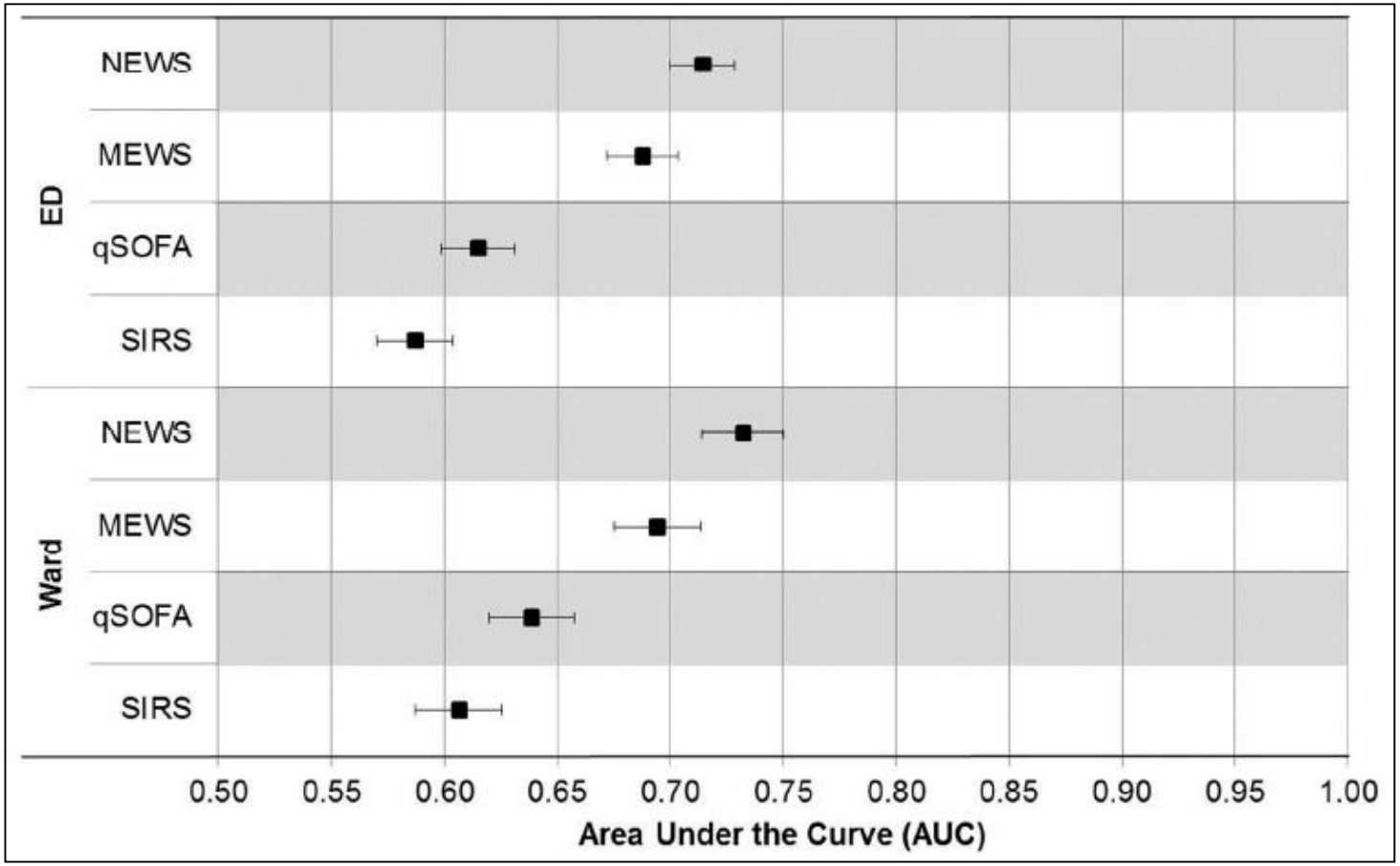
Paediatric Sepsis 6: Achieve the following within 1 hr. Refer to SORT sepsis pathway (www.sort.nhs.uk)	Time	Sign
1 Give High Flow Oxygen		
2 Record Blood Pressure and start urine collection (fresh nappy)		
3 Obtain iv/io access		
4 Take blood cultures, blood gas (include glucose & lactate)		
5 Give Ceftriaxone 80mg/kg. Think: If neutropaenic / immunocompromised / neonate, USE local guidance.		
6 Fluid Resuscitation if required: 20ml/kg 0.9% Saline, reassess and repeat as required.		

Reasses

Within 1 hour of treatment	Yes/No
1 HR or RR still above age specific normal range or CRT >3 seconds	
2 Venous (or arterial) Lactate >2	
3 Signs of fluid overload (hepatomegaly, desaturations, crepitations)	

If "YES" to ANY of above, Escalate Care to Consultant +/- ITU +/- SORT :02380 775502

Going forwards?



Churpek et al. AJRCCM 2016

Oxford AHSN approach

- Regional approach to implementation

- Integrate into existing pathways
  - Community
  - Acute admissions
  - Deteriorating patients (Track & Trigger / Early Warning Scores)

- Build on progress already made
  - ‘Red Flag’ Sepsis
  - Sepsis Six
  - Neutropaenic Sepsis

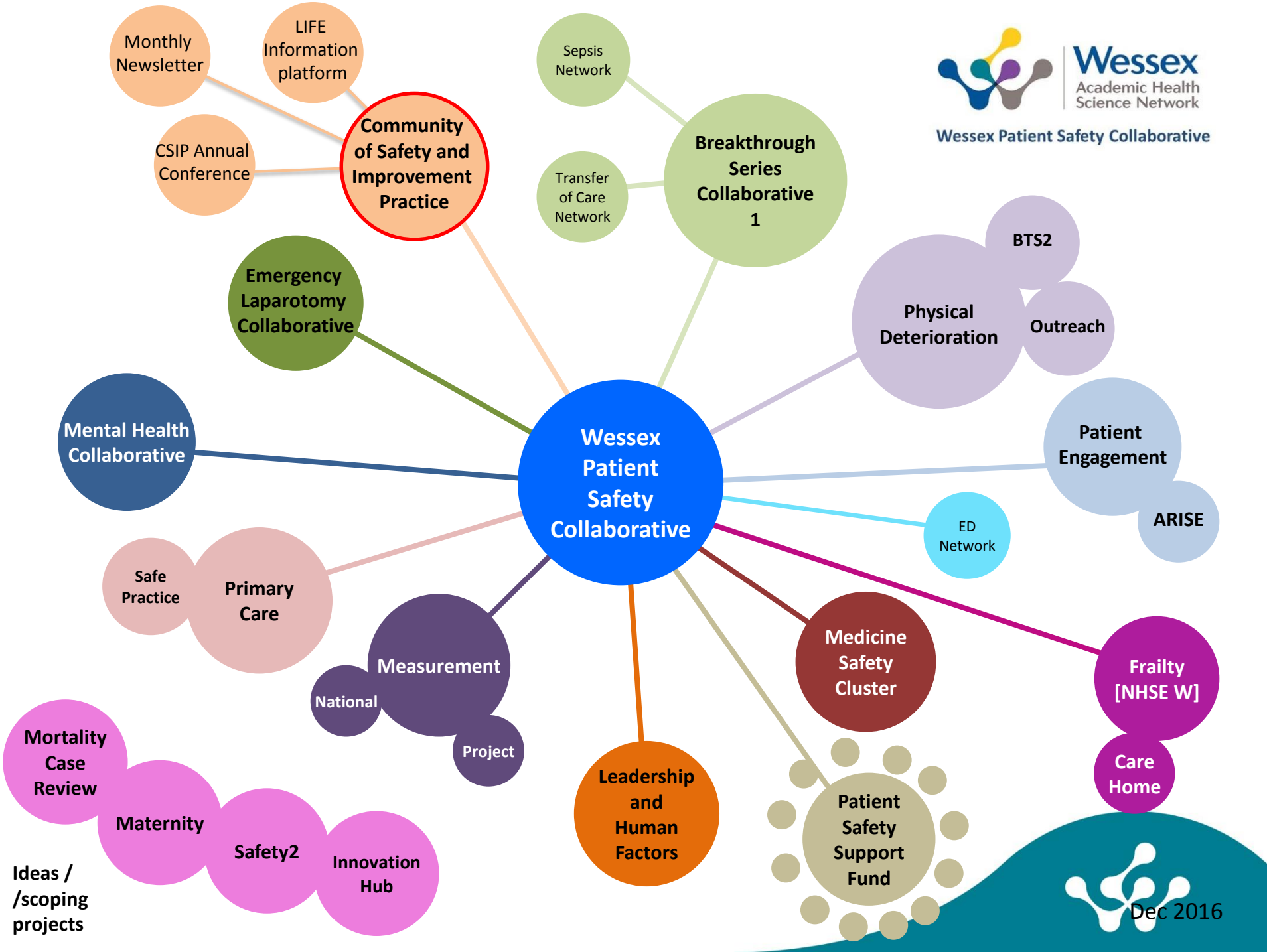
Wessex
Academic Health
Science Network
Wessex Patient Safety Collaborative

Standardising the language of deterioration in healthcare

Dr Matt Inada-Kim and Mr Geoff Cooper

Wessex Patient Safety Collaborative

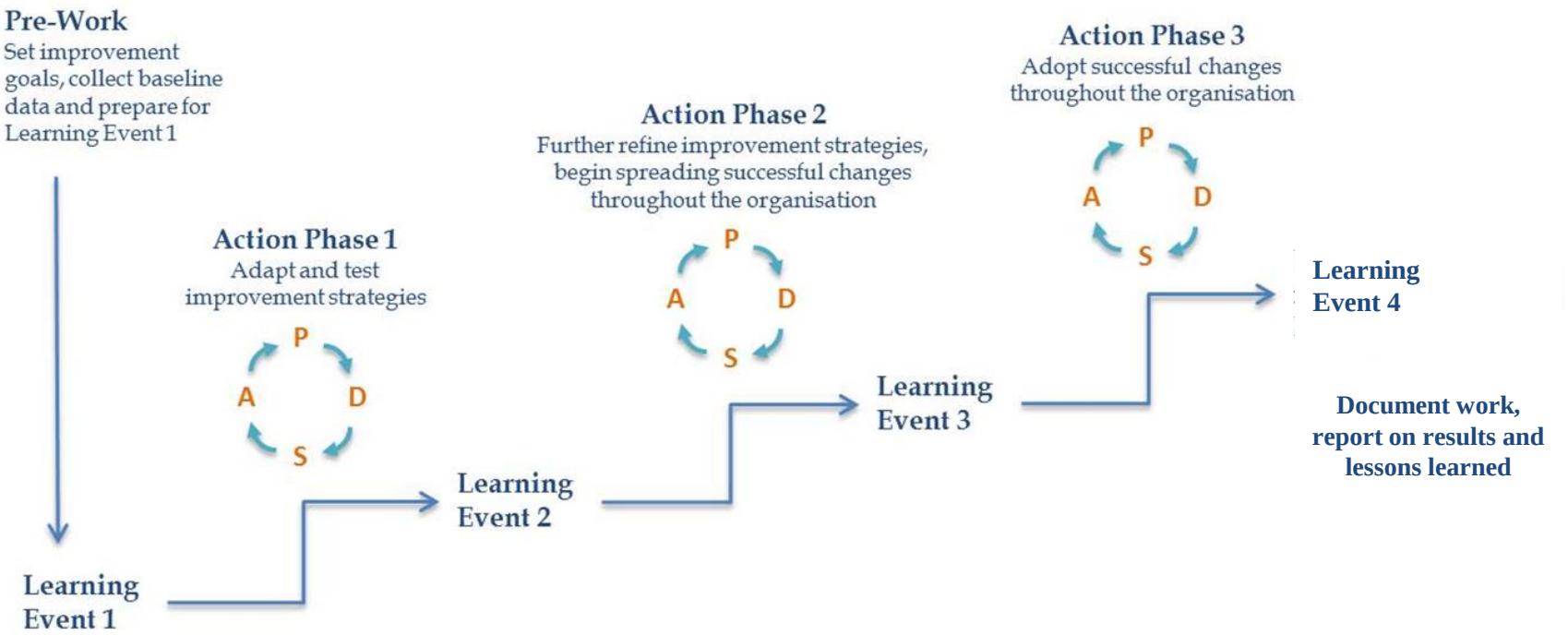
A Masterclass based on lessons learned from a collaborative pilot to standardise terminology relating to physical deterioration included a large general practice, 3 care homes, the acute hospital and the ambulance service.


Wessex Academic Health Science Network
Wessex Patient Safety Collaborative
Wessex Patient Safety Collaborative
Monthly Newsletter
LIFE Information platform
CSIP Annual Conference
Community of Safety and Improvement Practice
Sepsis Network
Transfer of Care Network
Breakthrough Series Collaborative 1
Emergency Laparotomy Collaborative
Mental Health Collaborative
BTS2
Physical Deterioration
Outreach
Patient Engagement
ARISE
ED Network
Safe Practice
Primary Care
Measurement
National
Project
Medicine Safety Cluster
Frailty [NHSE W]
Care Home
Mortality Case Review
Maternity
Safety2
Innovation Hub
Leadership and Human Factors
Patient Safety Support Fund
Ideas / /scoping projects
Dec 2016

Breakthrough Series (BTS)

Wessex Academic Health Science Network

Wessex Patient Safety Collaborative

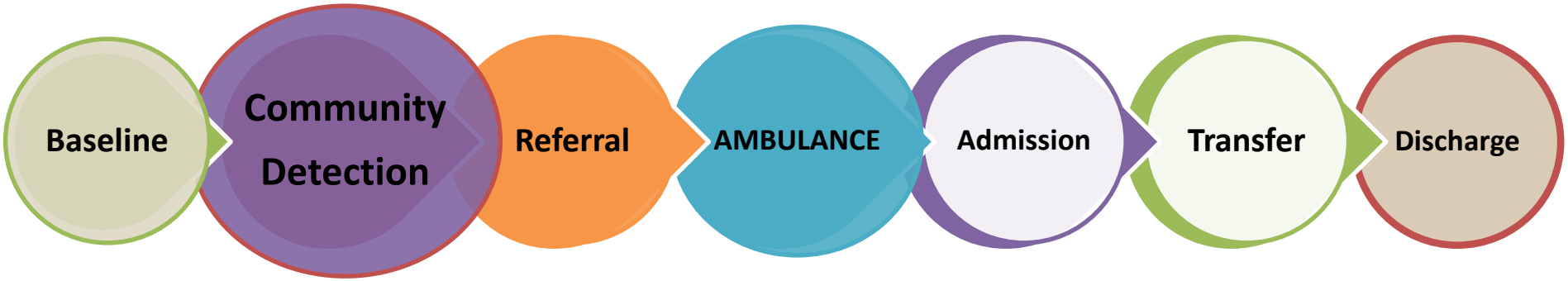


Wessex Patient Safety Collaborative

Connecting and sharing across Wessex to improve patient safety

Most Sepsis arises in the Community, but the focus is on hospitals

Hypotheses: A single, standardised language and pathway for sickness will improve outcomes
Why should the calculation of risk only start in the hospital?



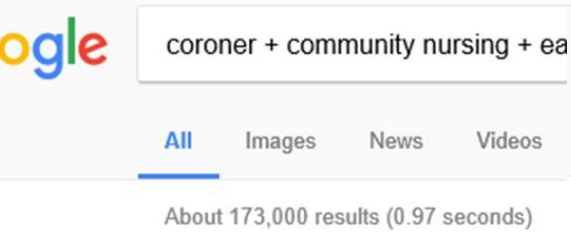
	Baseline NEWS	GP NEWS	Communication NEWS	Transportation NEWS	Arrival NEWS	Track/trigger NEWS	Baseline NEWS
2010	✗	✗	✗	✗	✗	✓	✗
2013	✗	✗	✗	✗	✓	✓	✗
2016	✗	✗	✗	✗	✓	✓	✗
2018	✓	✓	✓	✓	✓	✓	✓

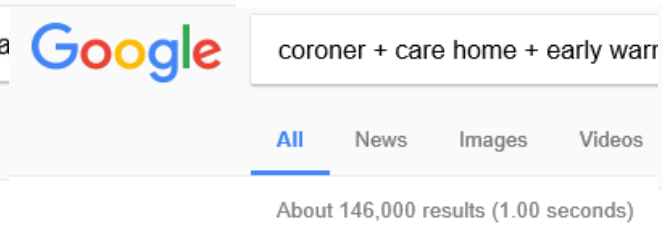
Matt Inada-Kim, Acute Physician, Hampshire Hospitals
National Clinical Advisor, Clinical Lead for Physical Deterioration & Sepsis, Wessex PSC

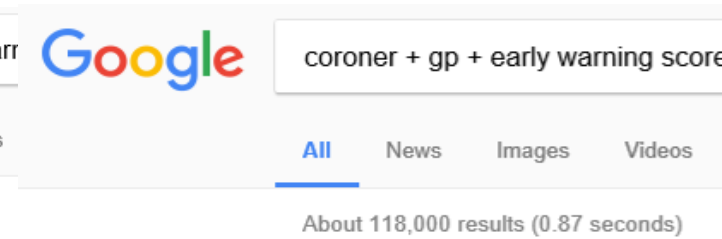
1. We need to focus on the Community

NCEPOD Sepsis cases prehospital Obs

Vital signs recorded	GP (n=129)	%	Paramedic (n=163)	%
Temperature	34	26.4	146	89.6
Blood pressure	32	24.8	157	96.3
Heart Rate	40	31.0	163	100
Respiratory Rate	8	6.2	159	97.5
AVPU	8	6.2	144	88.3





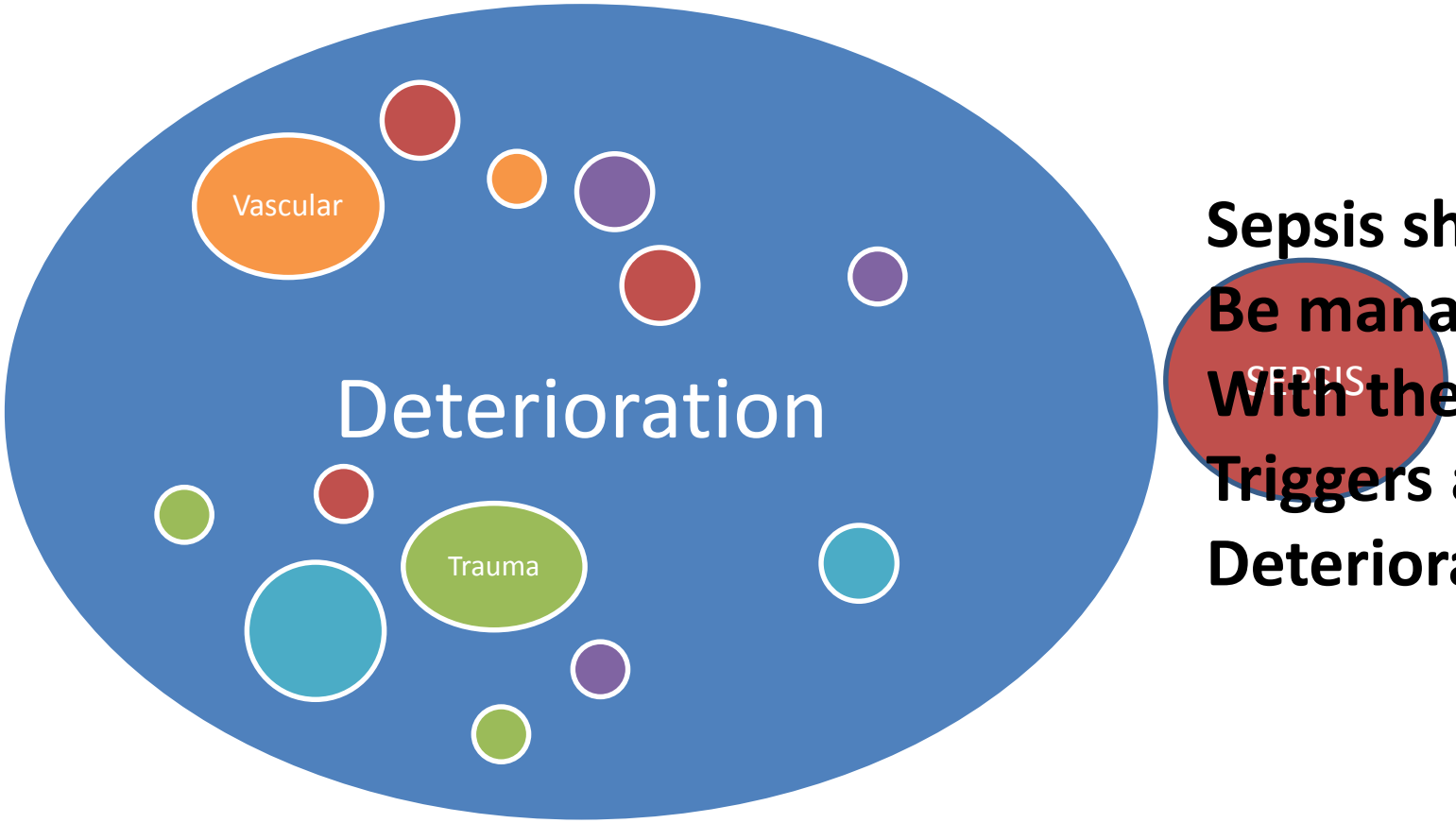


"National Early Warning Score (**NEWS) should be used in both primary care and secondary care for patients where sepsis is suspected**. This will aid the recognition of the severity of sepsis and can be used to prioritise urgency of care"

NCEPOD 2015

2. Separating Sepsis from Deterioration is harmful

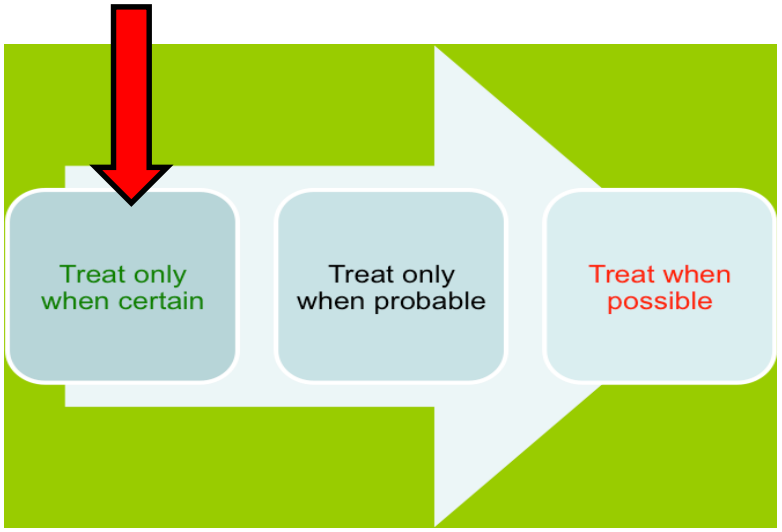
Could this be sepsis in every deterioration

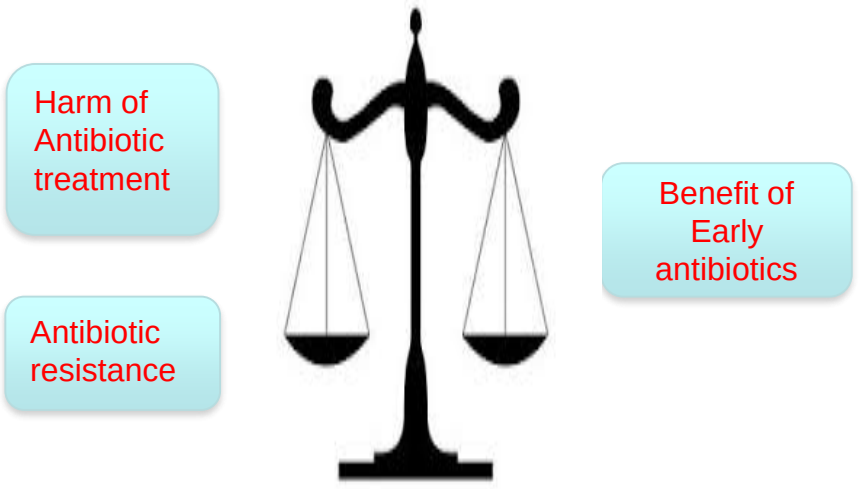


Sepsis should Be managed With the Same Triggers as for Deterioration

But not all deterioration is Sepsis

3. We don't treat ***sepsis***, we treat on ***suspicion***





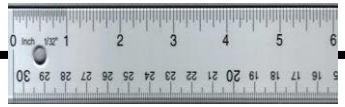
Rx Broad spectrum antimicrobials

Start Smart, then focus

Protocolised Diagnosis & Rx

Clinical Judgement

4. In order to improve, Processes must be hardwired to Outcomes



measurement for improvement

Wessex Academic Health Science Network

Wessex Patient Safety Collaborative

PROCESSES

Screening

Administration time

Antibiotic reviewing

OUTCOMES

Analyse the **"Suspicion of sepsis"** group
Mortality / ICU admissions
Length of stay/ comorbidites

Benchmark data over time and share results

Evaluate the efficacy of sepsis improvement

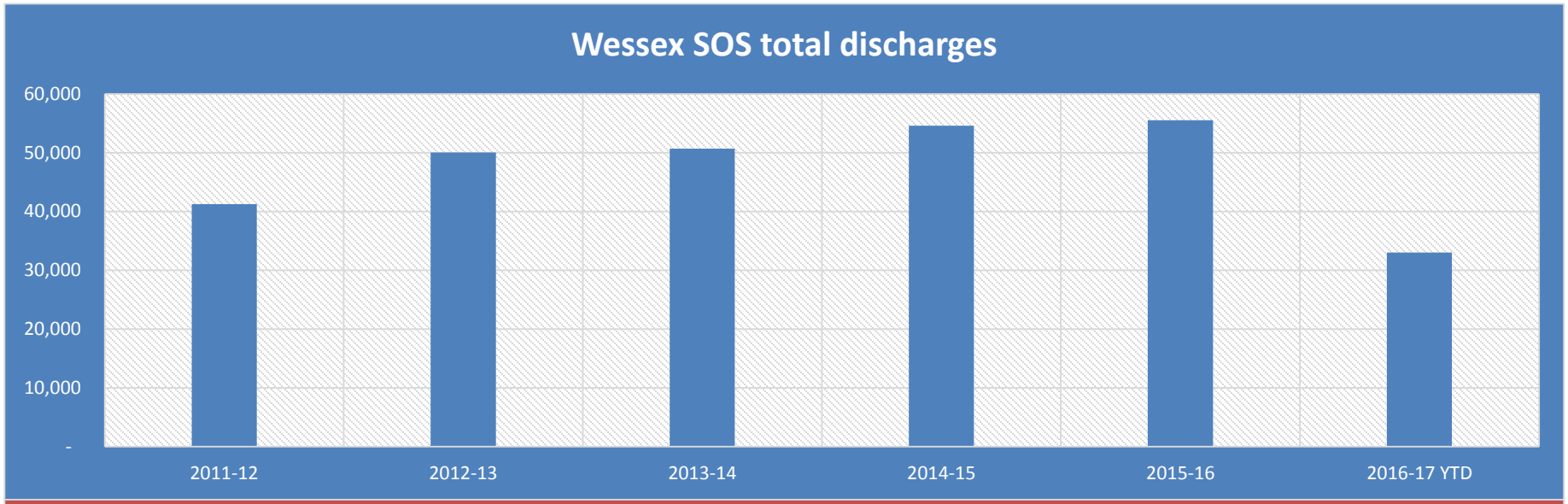
4. Patients define their *badness* by where they are managed…

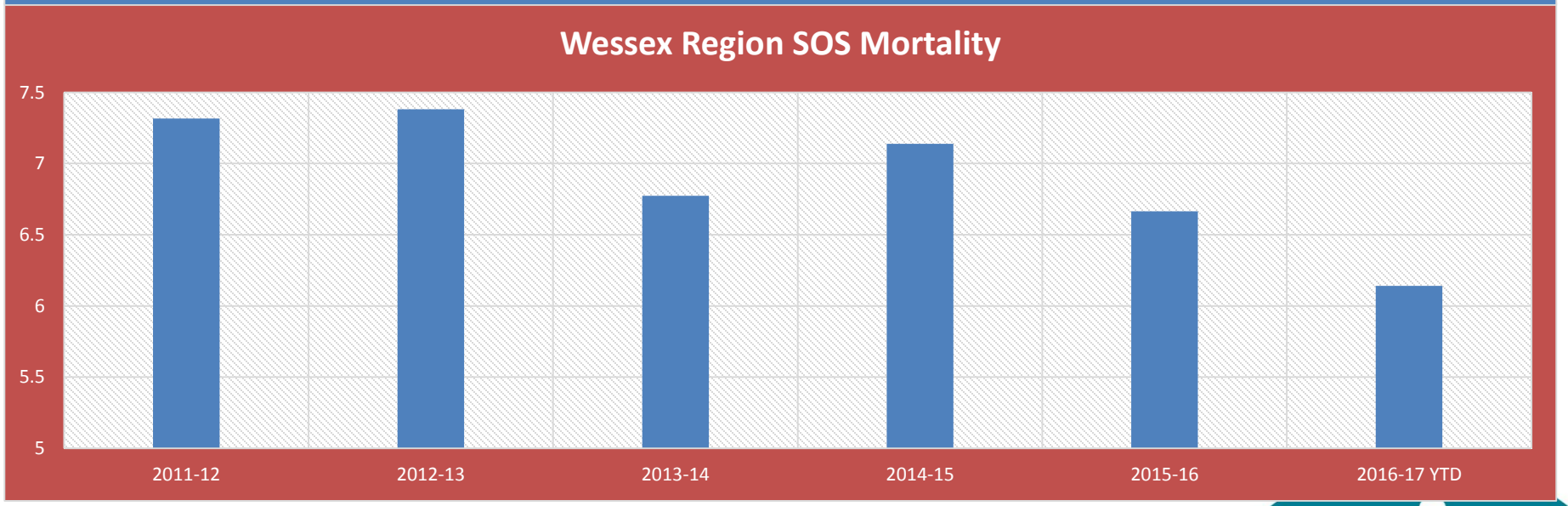
Location	Label	"n"/year (estimated)	Mortality (estimated)	NEWS (off baseline)	Antibiotics
Community 					
Stays at home	"Self limiting illness"	12 million	<0.1%	0-1	-
Sees GP but not referred	"Infection"	8 million	<1%	0-2	-/PO
Referred but not admitted	"Infection"	400,000	2%	0-3	PO/IV
Hospital 					
Hospitalized (mild)	**Suspicion of Sepsis**	**1,000,000**(MIK)	**7%**	**≥3**	**PO/IV**
Hospitalized (moderate)	Suspected Sepsis	300,000	23%	≥5	IV
Admitted to ICU	Suspected Sepsis	36,000(ICNARC)	35%	≥7	IV

Suspicion of Sepsis (SOS) = All bacterial infection derived codes (ICD 10)

≈ Sepsis outcomes measurement & Evaluation of sepsis screening/improvement

Wessex PSC Outcomes from an Acute focus on Sepsis





“Speaking the same language is a game changer”

Mr AS- sepsis survivor

With thanks WEAHSN

https://vimeo.com/208284106

Pan pathway Metrics

Time point	Mr Sutton	Mrs X
Patient becomes unwell	20:00	20:00
Calls GP reception		09:00
GP Appointment		10:30
Ambulance call	20:08	10:45
Ambulance dispatch	20:08	14:00
Ambulance arrival	20:21	15:00
Ambulance departure	20:49	15:45
Pre alert	☑	☒
A&E arrival	21:20	16:00
Antibiotic prescription	21:35	17:45
Antibiotic administration	21:45	18:35
Delay onset to antibiotics	1:45	22:35
Discharge	3 days	17 days
Function	Independent	Carer BD

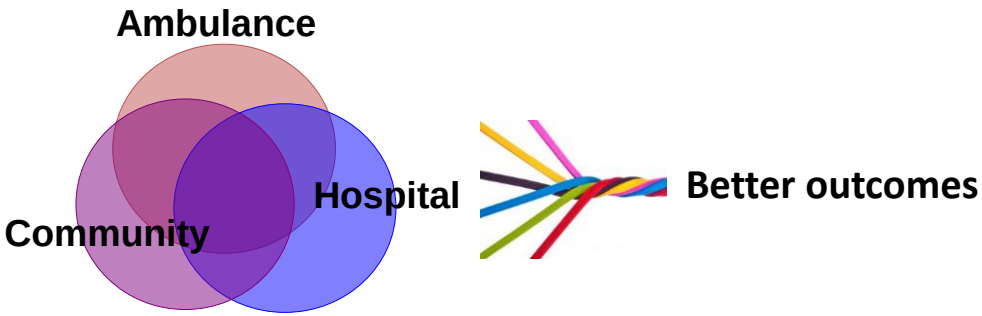
5:30 ?NEWS

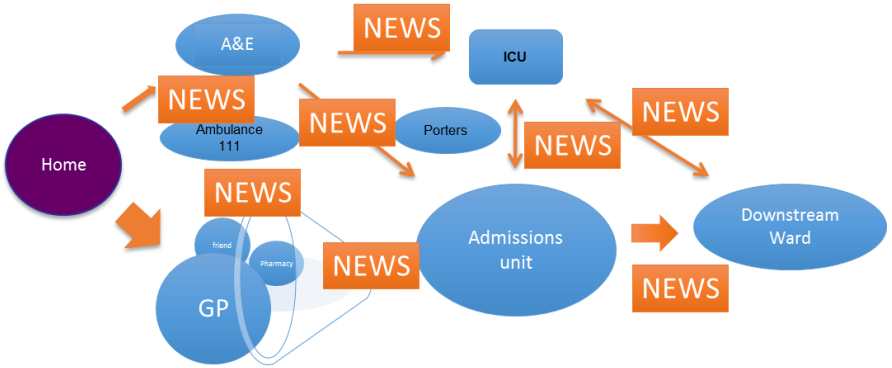
2:35

Dialects & Tribes

A Collaborative improvement strategy

Mark Ainsworth-Smith, Michael Lambert, Matthew Richardson





System

The same physiological language

Integrated pathways co designed

A single tool

Collaborative pan pathway Ownership

Sustained engagement

Seamless transitions of care

Strategy

1. Align Hospitals ☑
2. Implement in Ambulances ☑
3. Community pilot ☑
4. Widespread dissemination

Wessex Academic Health Science Network

South Central Ambulance Service NHS Trust

The Friarsgate Practice

NHS West Hampshire Clinical Commissioning Group

GP NEWS Pilot

120 Consecutive admissions

80 SOS

With Suspicion of Sepsis (SOS) codes
25k city population, 11% mortality

	RR	SpO_2	Temp	SBP	HR
All	20.7%	72.4%	75.9%	75.9%	86.2
Home Visits	21.1%	68.4%	84.2%	89.5%	84.2
Surgery	20.0%	80.0%	60.0%	50.0%	90.0

NEWS =
Great predictor for admission

No additional time for consultation

16 August 2016

Dear Colleague,

RE: Use of the National Early Warning Score in Primary Care

As GPs we not only want to provide the best care for our patients but also when we are concerned about patients, we need to be able to access the care they require in a timely manner. In addition, when patients' health deteriorates it is always helpful to have robust evidence to justify how the decision was made regarding the actions taken by individual clinician.

The ***National Early Warning Score*** is being used routinely in hospitals, by the Ambulance Service and is going to be available for use in Care Home Homes. It is therefore important that not only general practice understands how this is used by the wider NHS but also how it may be a useful tool to be used in general practice. This tool has been tested in Mid Hampshire and has been found to be helpful.

It is estimated that integration of NEWS into the whole care pathway across England could save 6000 lives per year. A NEWS App can be downloaded for Android and Apple devises by searching NEWS and sepsis screen.

What is NEWS?

This is a validated scoring system recommended that will help and support clinicians and not replace clinical skills. A score of 0-3 is allocated to seven physiological measurements and these are:

- Respiration Rate
- Oxygen Saturations
- Supplemental Oxygen
- Temperature
- Systolic BP
- Heart Rate
- Level of Consciousness (defined on the AVPU system)

The NEWS scores are directly linked to mortality, the higher the score above what would normally be expected for the patient, the worse the prognosis.

When a single admission NEWS score is taken in patients with symptoms of infection (the commonest reason for admission) the mortality equates to:

NEWS Score	*Mortality*
0	0.5%
<5	5.5%
≥5	**22%**
≥7	**27%**
≥9	**38%**

Baseline observations

Patients with chronic hypoxic states (e.g. COPD) are likel to always score for hypoxia even when well; knowing their baseline oxygen level and the presence of a deterioration in this and in their function is the best guide to determine admission

NEWS in Care Homes

Wessex Academic Health Science Network | Hampshire County Council | NHS West Hampshire Clinical Commissioning Group

National Early Warning Score

NEWS

Surname:
NHS No.
DOB
ROOM No.

Adult Physiological Observation & Escalation Chart

DOES YOUR RESIDENT HAVE?

Increasing (or new onset) confusion or less alert than normal

Worse than normal lethargy or withdrawal or anxiety / agitation / apprehension

Worsening shortness of breath (can't talk in sentences), chestiness or fast breathing

Any concern that your resident is not as well as normal

New or increasing oxygen requirement

New offensive urine or can't pee

Diarrhoea, vomiting or dehydration

Cold hands / feet or worsening skin colour or puffiness

Shivery, fever or feels very hot or cold

Can't walk or 'off legs'

If you answer yes to any of these triggers, your resident is at risk of deterioration

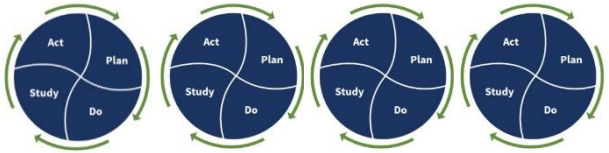
UNDERTAKE COMPLETE SET OF OBSERVATIONS → CALCULATE NEWS → ESCALATE USING ESCALATION TOOL → COMMUNICATE USING SBAR AND RECORD YOUR ACTIONS

1. **Signs of Deterioration/Sepsis**
2. **Baseline NEWS**
3. **Obs Chart**
4. **Escalation directions**
5. **Communication tool**

CCG / AHSN Injected QI capacity

- Baseline 100 patients
- 27 **PDSA** cycles
- 3 **pilot** sites
- 4 **training** sessions
- 5 **focus** groups
- 5 case studies
- 100% +ve feedback

Now spreading pan Wessex + Across community care



Oxford Academic Health Science Network

SUSPICION OF SEPSIS (SOS)

Measuring patient outcomes

How do we evaluate the impact of local, regional and national sepsis programmes?

Bethan Page (Oxford AHSN)

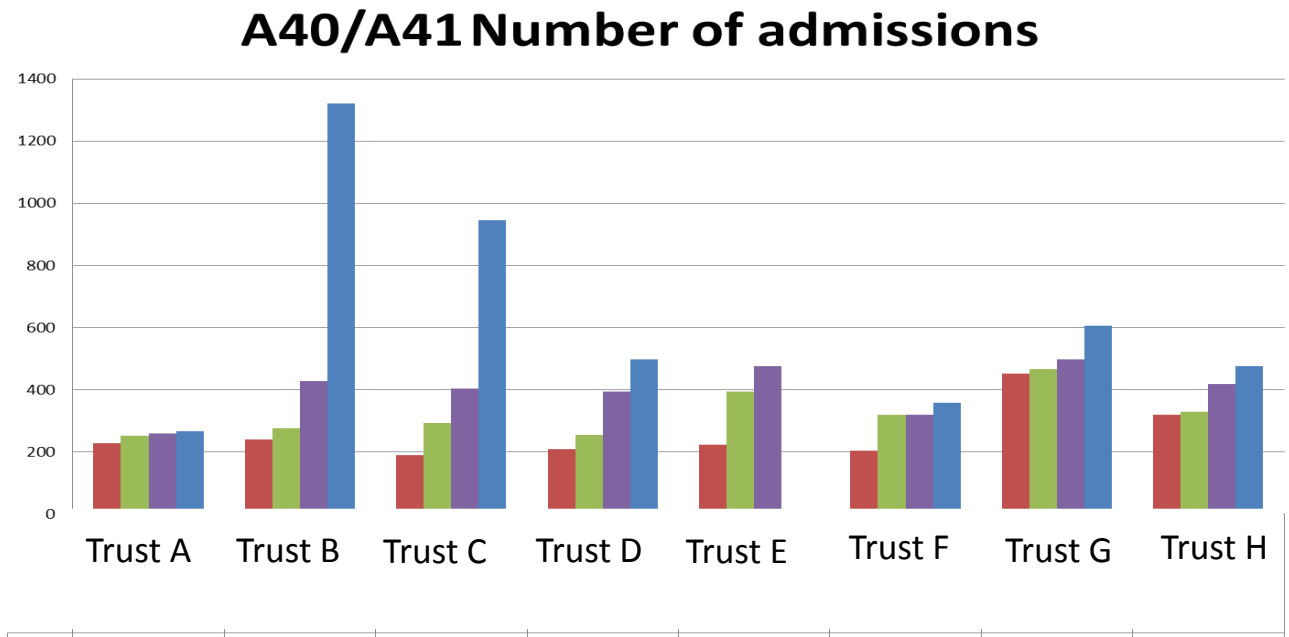
In collaboration with Dr Matt Inada-Kim (Wessex AHSN)

Measurement & surveillance

- **Surveillance** needed to monitor sepsis burden and assess impact of interventions
- Ideally need readily available metrics which can be applied and compared nationally
- HES data is most readily available

Limitations of HES sepsis codes

- Sensitivity of HES sepsis codes (A40/A41) is poor
- **Ascertainment bias** as sepsis initiatives (including CQUIN) change coding practice



	Trust A	Trust B	Trust C	Trust D	Trust E	Trust F	Trust G	Trust H
2012	228	240	190	209	223	204	452	320
2013	252	276	292	254	394	319	466	329
2014	260	428	404	394	477	320	497	417
2015	267	1321	946	497		357	607	477

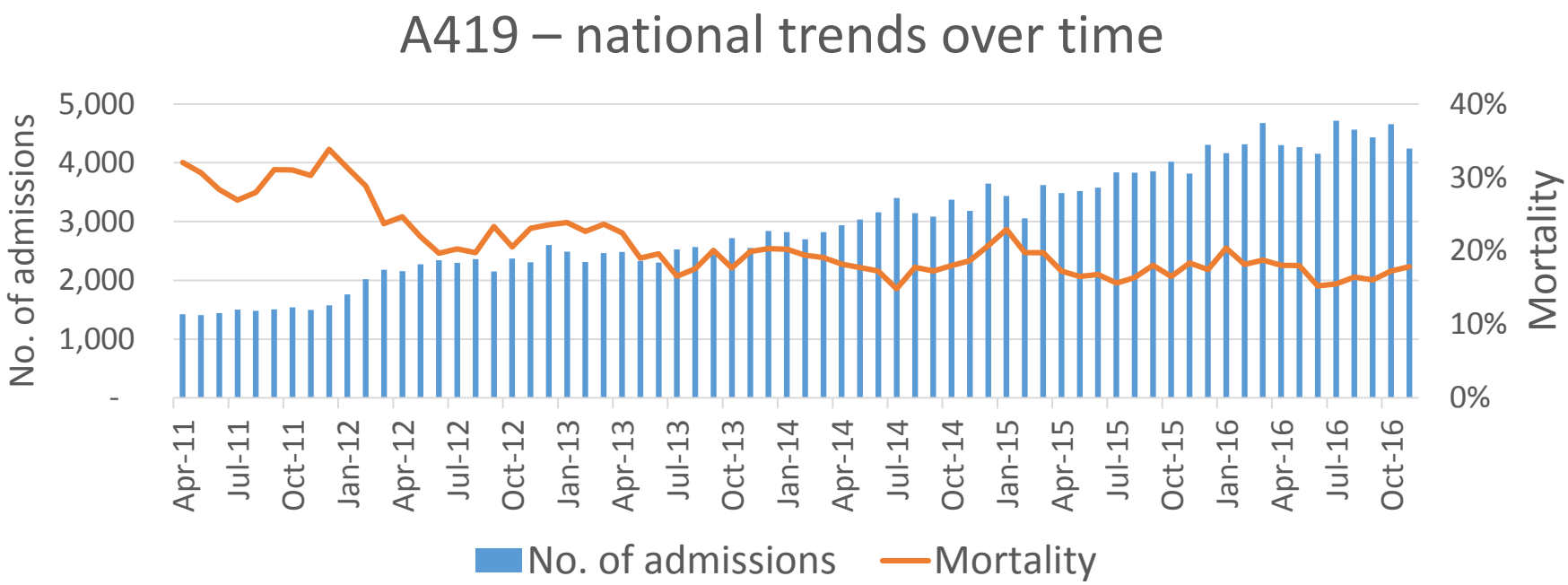
Suspicion of sepsis (SOS)

Need an improved **case definition** for surveillance.

'SOS' codes include all bacterial infections.

Advantages include:

- More sensitive
- Identifies wider group of patients at whom many of the sepsis interventions are directed
- Should be less susceptible to ascertainment bias (due to changing coding practices)


A419 – national trends over time
No. of admissions
5,000
4,000
3,000
2,000
1,000
-
40%
30%
20%
10%
0%
Mortality
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
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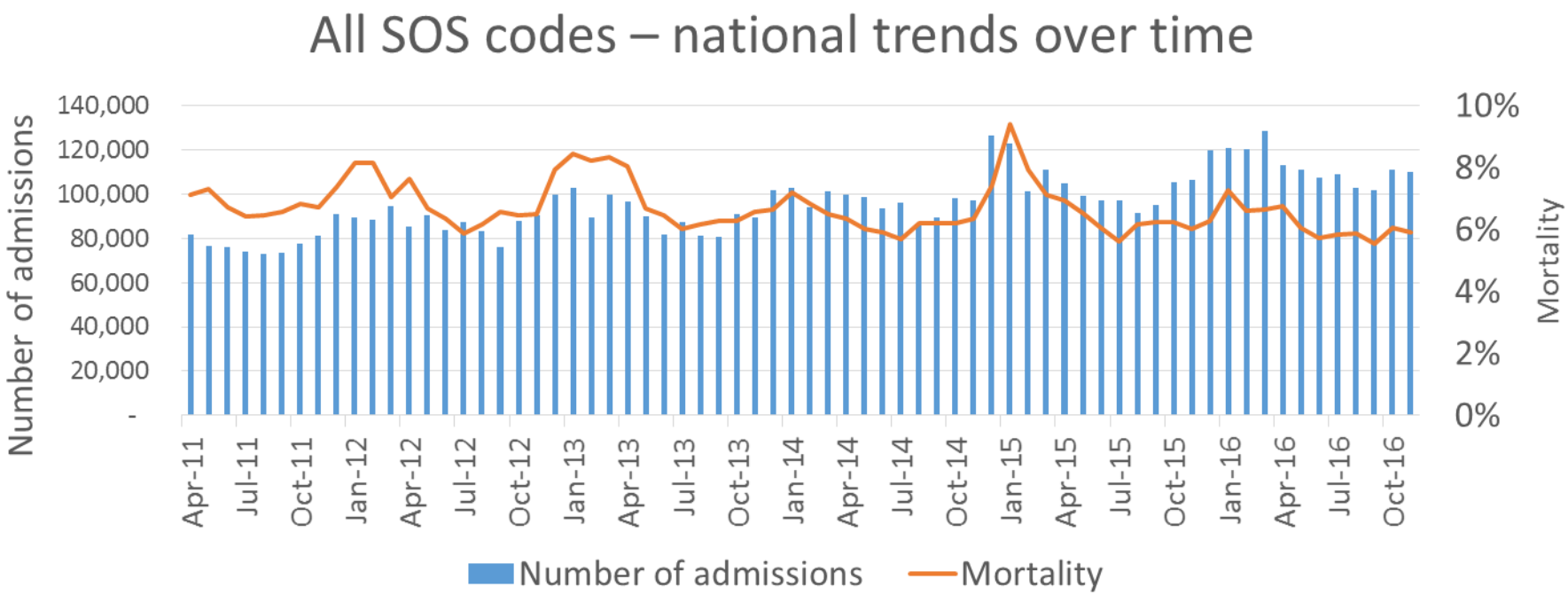
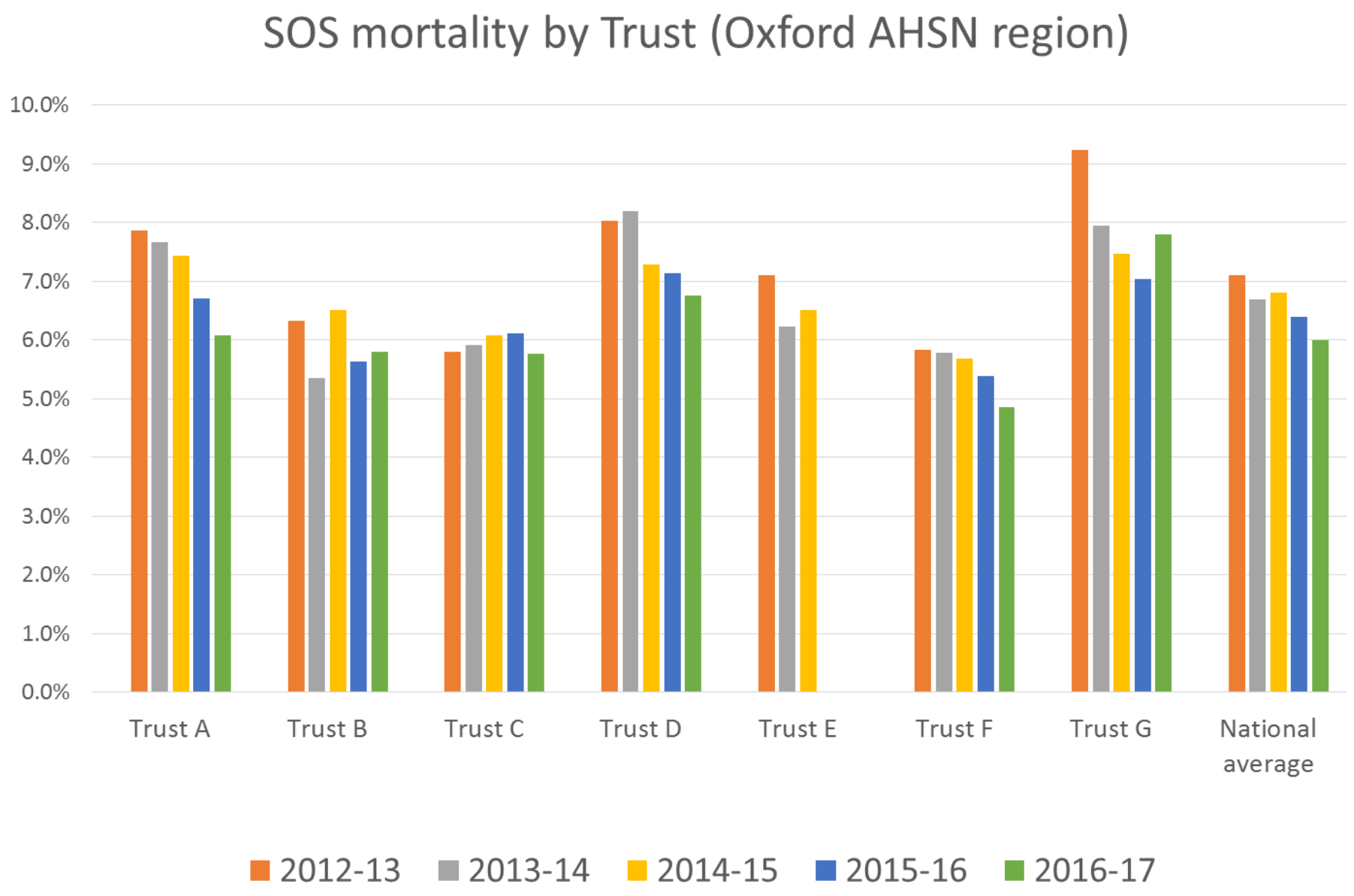
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
No. of admissions
Mortality


All SOS codes – national trends over time
Number of admissions
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
10%
8%
6%
4%
2%
0%
Mortality
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Number of admissions
Mortality

SOS outcomes for Oxford AHSN region

	2012-13	2013-14	2014-15	2015-16	2016-17* (up to sept)
Admissions	52357	55077	63008	67817	33990
Mortality	6.7%	6.3%	6.3%	5.8%	5.2%
Length of stay	6.3	6.4	6.4	6.3	5.3
Readmissions	6.0%	6.2%	6.3%	6.6%	6.2%

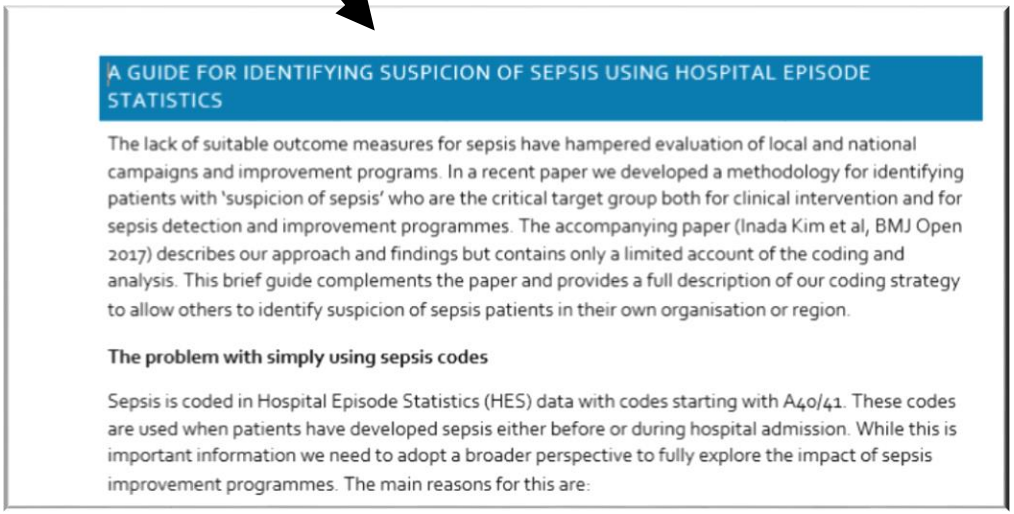

SOS mortality by Trust (Oxford AHSN region)
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
Trust A
Trust B
Trust C
Trust D
Trust E
Trust F
Trust G
National average
2012-13
2013-14
2014-15
2015-16
2016-17

Future plans

- 30 day mortality (currently inpatient mortality)
- Incorporate ICU HES data
- Link to blood culture data to validate methodology
- NHS England collaboration to use methodology nationally
- A short guide for identifying SOS patients in your organisations and regions is available to take away today

BMJ Open

Paper in press with BMJ Open this month
(Inada-Kim, Page, Maqsood & Vincent, 2017)



A GUIDE FOR IDENTIFYING SUSPICION OF SEPSIS USING HOSPITAL EPISODE STATISTICS

The lack of suitable outcome measures for sepsis have hampered evaluation of local and national campaigns and improvement programs. In a recent paper we developed a methodology for identifying patients with 'suspicion of sepsis' who are the critical target group both for clinical intervention and for sepsis detection and improvement programmes. The accompanying paper (Inada Kim et al, BMJ Open 2017) describes our approach and findings but contains only a limited account of the coding and analysis. This brief guide complements the paper and provides a full description of our coding strategy to allow others to identify suspicion of sepsis patients in their own organisation or region.

The problem with simply using sepsis codes

Sepsis is coded in Hospital Episode Statistics (HES) data with codes starting with A40/41. These codes are used when patients have developed sepsis either before or during hospital admission. While this is important information we need to adopt a broader perspective to fully explore the impact of sepsis improvement programmes. The main reasons for this are: