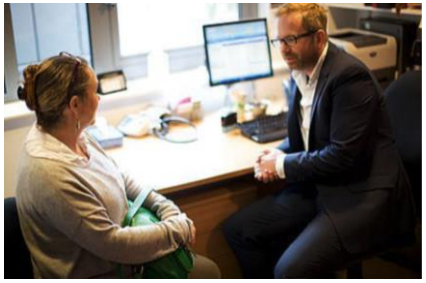
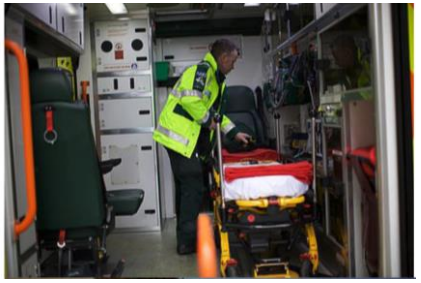
Oxford Academic Health Science Network

PATIENT SAFETY

From confusion to consensus:

The Oxford AHSN Sepsis Pathway

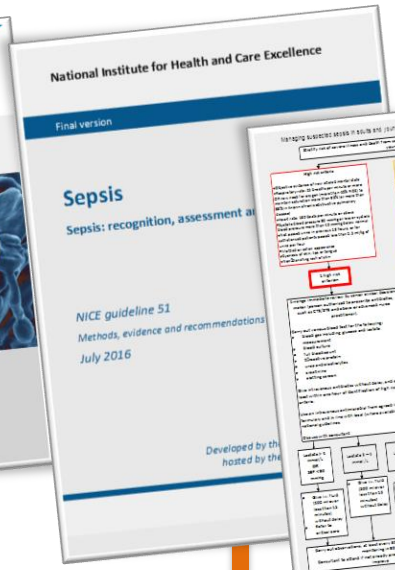


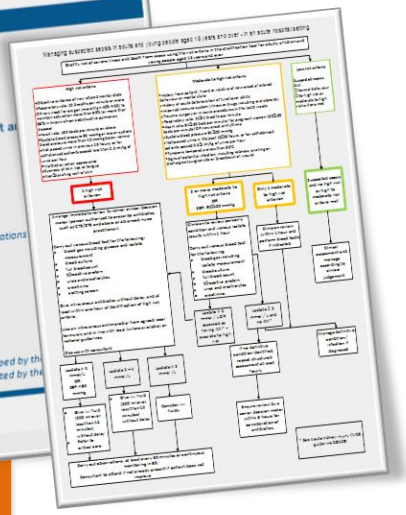



Andrew Brent

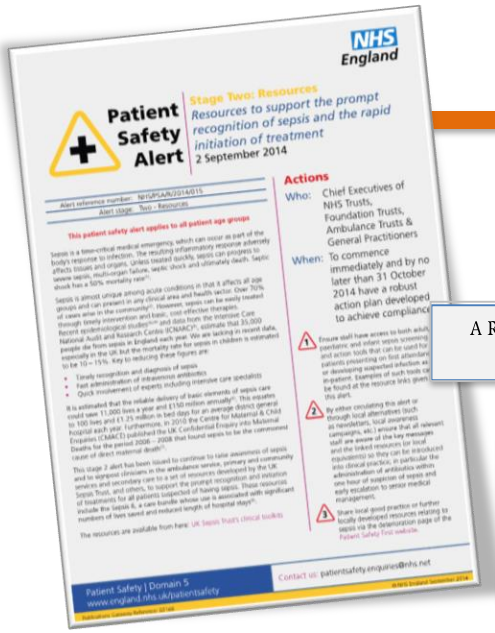
Sepsis Clinical Lead, Oxford AHSN

& Oxford University Hospitals NHS Foundation Trust





2013 2014 2015 2016 2017



Goal-Directed Resuscitation for Pa
with Early Septic Shock

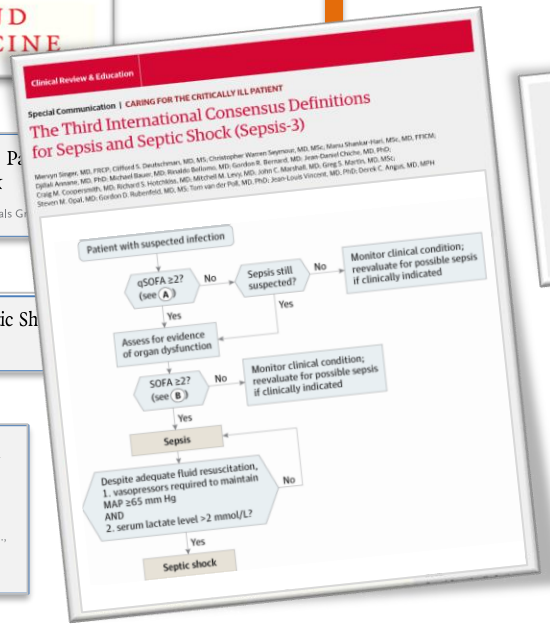
The ARISE Investigators and the ANZICS Clinical Trials Gr

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*



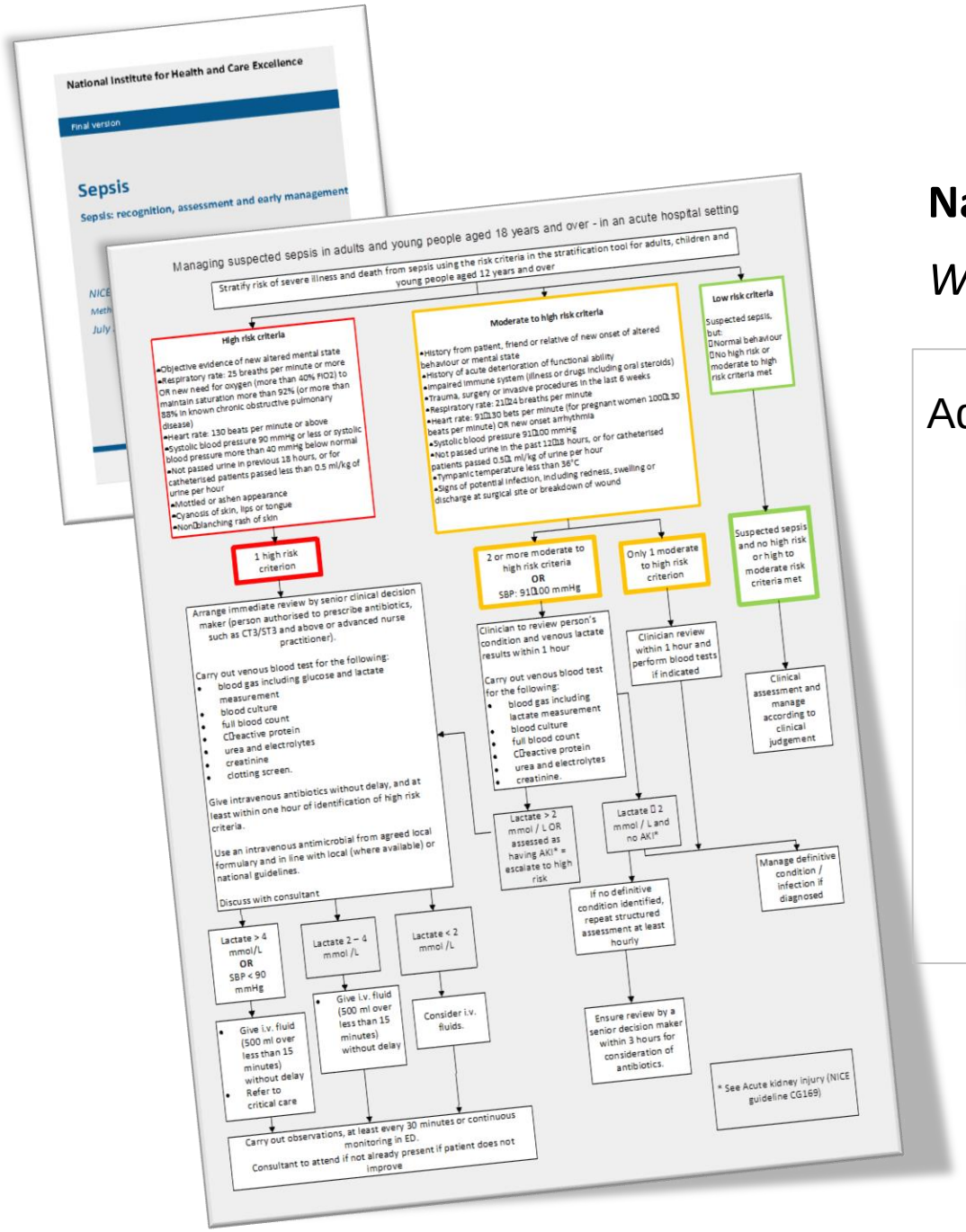
Sepsis

NICE quality standard

Draft for consultation

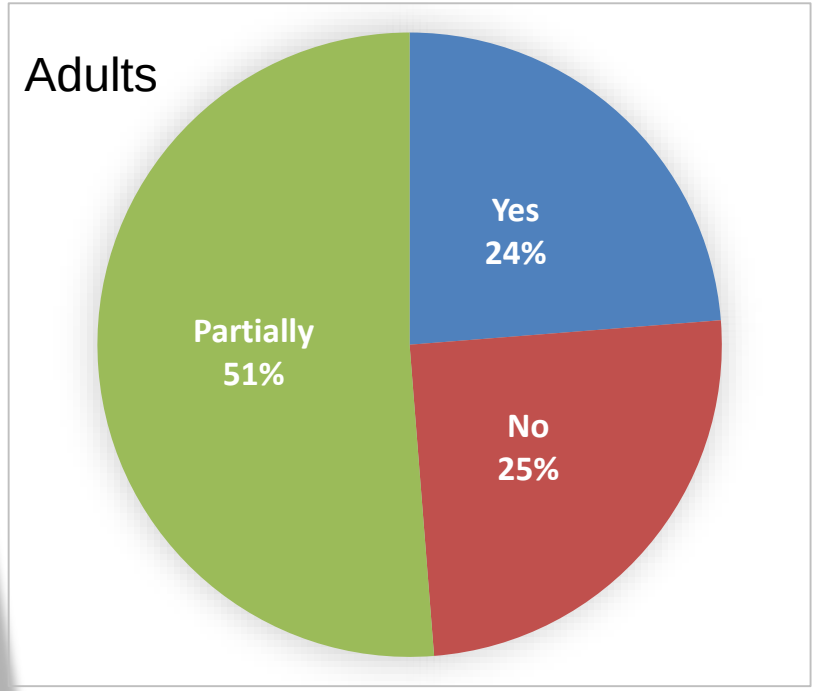
Oxford AHSN Sepsis Group Aims

- 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

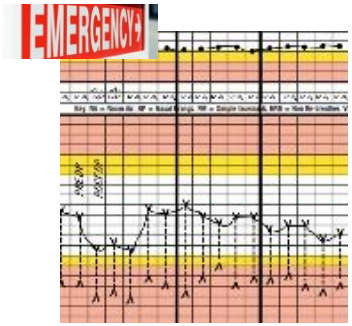
Will you be implementing NICE?



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

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

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 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

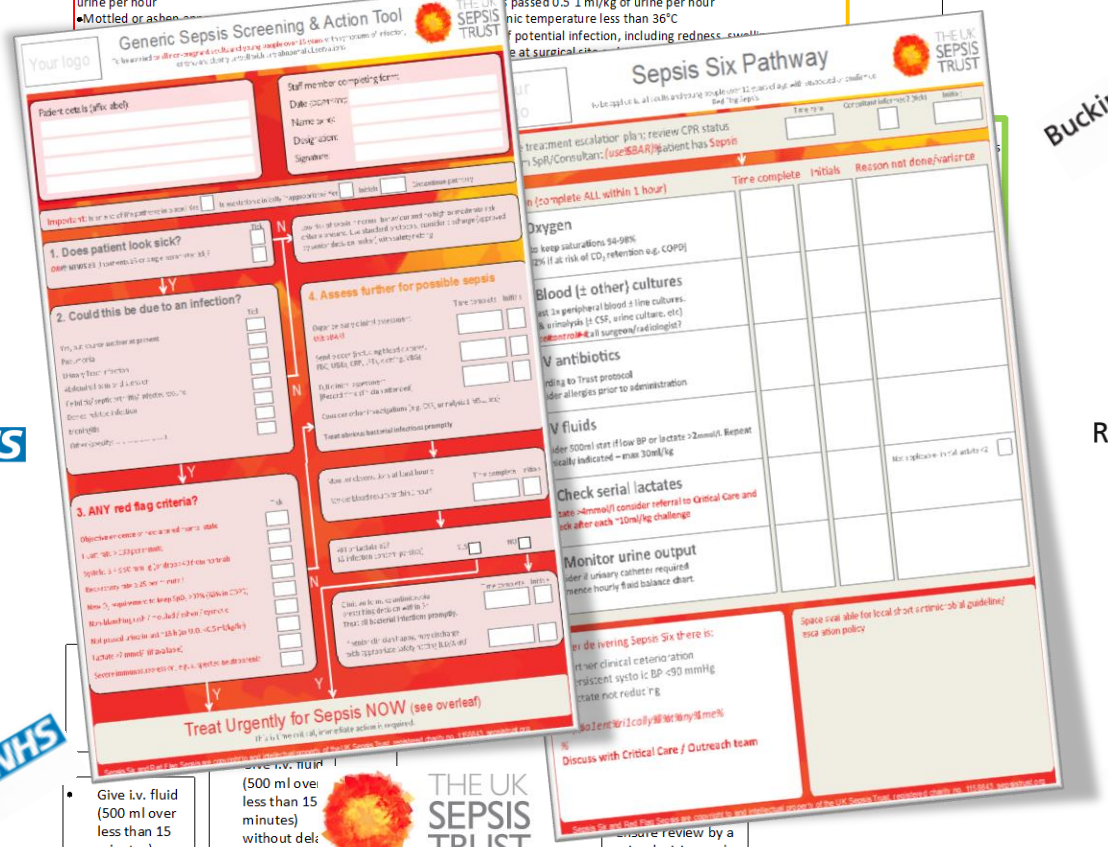
- Objective evidence of new altered mental state
- Respiratory rate: 25 breaths per minute or more OR new need for oxygen (more than 40% FiO2) to maintain saturation more than 92% (or more than 88% in known chronic obstructive pulmonary disease)
- Heart rate: 130 beats per minute or above
- Systolic 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, swelli
- 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

THE UK SEPSIS TRUST

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)**

Oxford University Hospitals NHS Trust

Buckinghamshire Healthcare NHS Trust

Heatherwood and Wexham Park Hospitals NHS Foundation Trust

Royal Berkshire NHS Foundation Trust

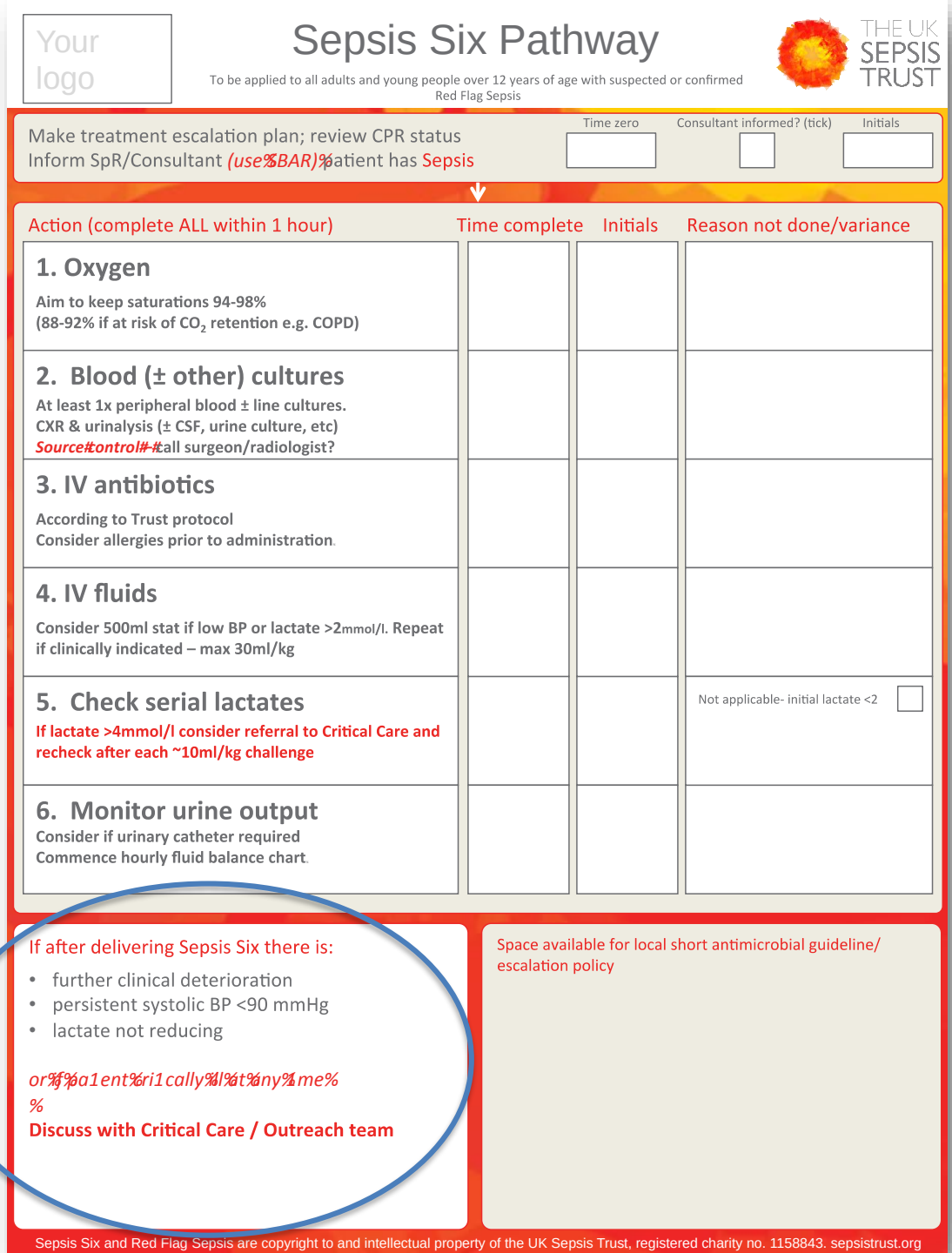
Milton Keynes University Hospital NHS Foundation Trust

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

Make treatment escalation plan; review CPR status
Inform SpR/Consultant *(use%BAR)%*atient has Sepsis

Time zero | Consultant informed? (tick) | Initials

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 ↓

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 ↑ (from 4 to 2)

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 ☐

Y ↓

Send bloods *(including blood cultures, FBC, U&Es, CRP, LFTs, clotting, VBG)* — Time complete ☐ Initials ☐

Organize early clinical assessment *USE SBAR! Review results within 1 hour* — Time complete ☐ Initials ☐

Time clinician attended ☐

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

N ↓

Clinician to make antimicrobial prescribing decision within 3h. ***Treat all bacterial infections promptly.*** — Time complete ☐ Initials ☐

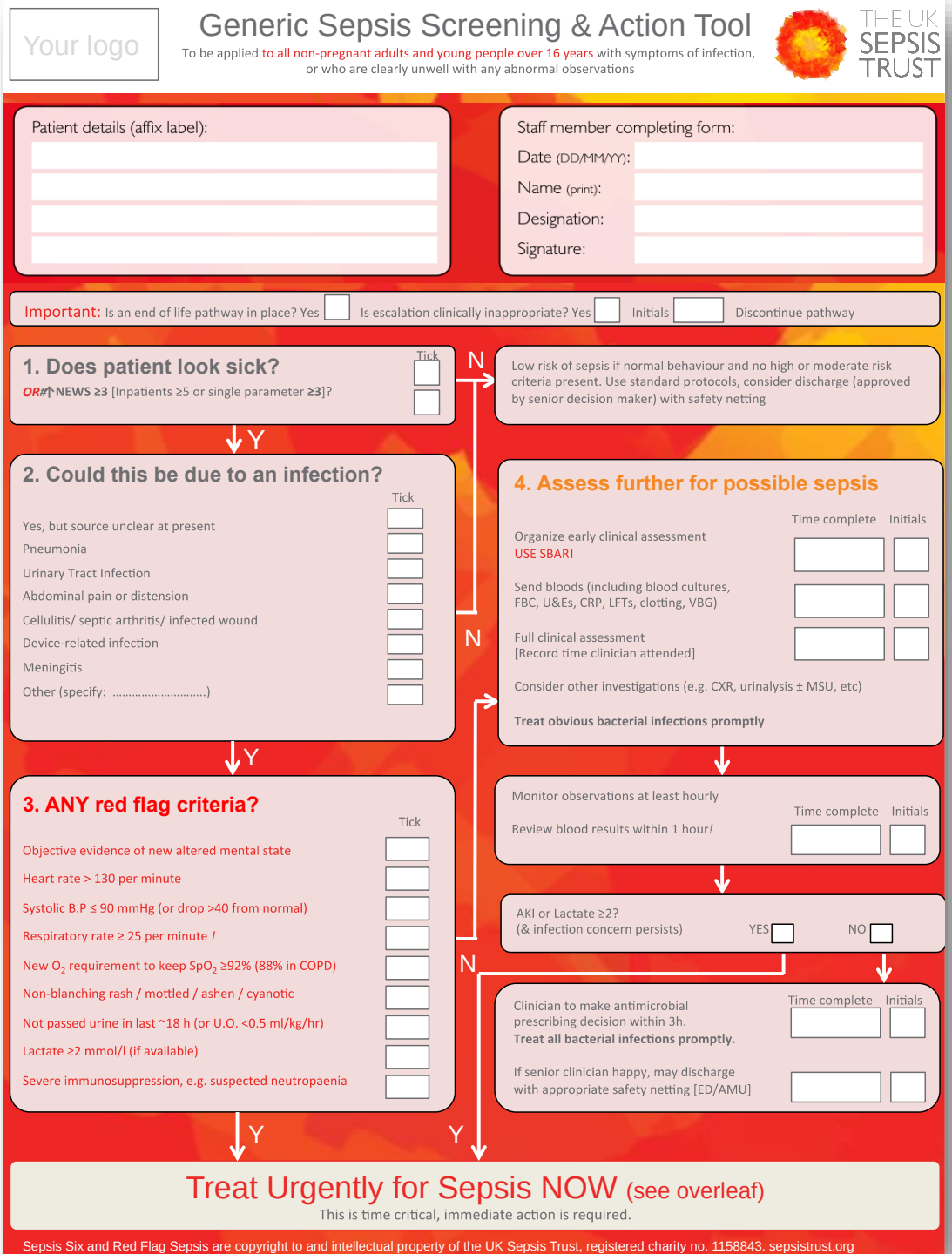
If senior clinician happy, may discharge with appropriate safety netting [ED/AMU] ☐

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

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 →

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

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	☐

Monitor observations at least hourly

	Time complete	Initials
Review blood results within 1 hour!		

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

N →

	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]		

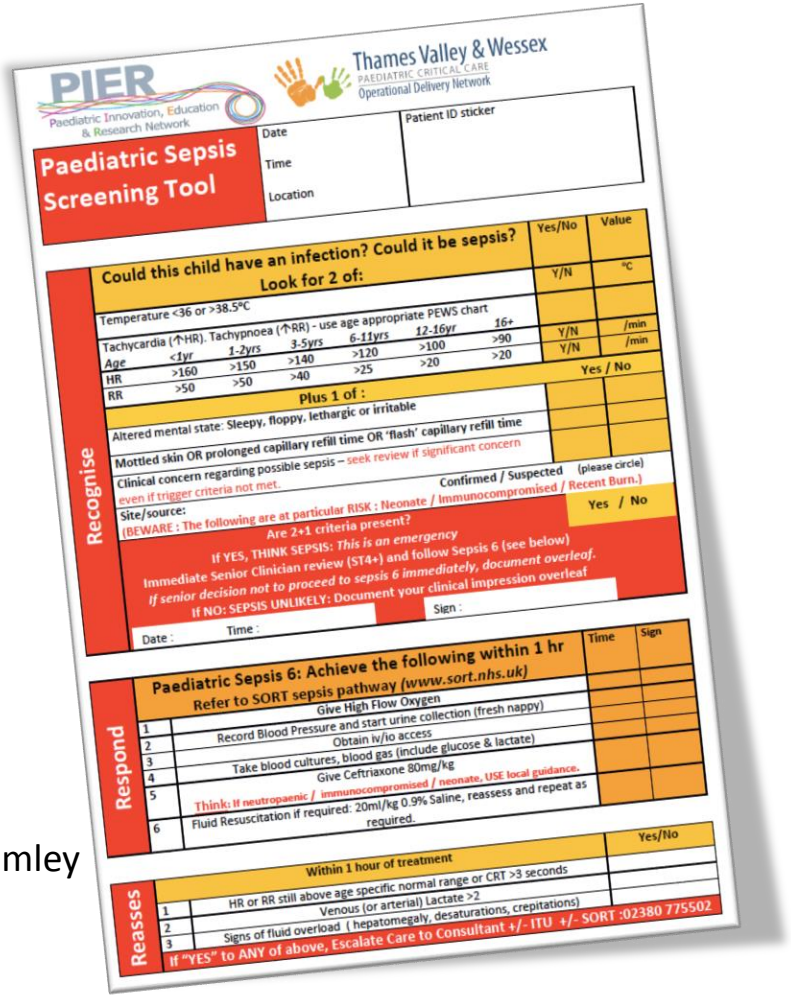
Y ↓ Y ↓

Treat Urgently for Sepsis NOW (see overleaf)
This is time critical, immediate action is required.

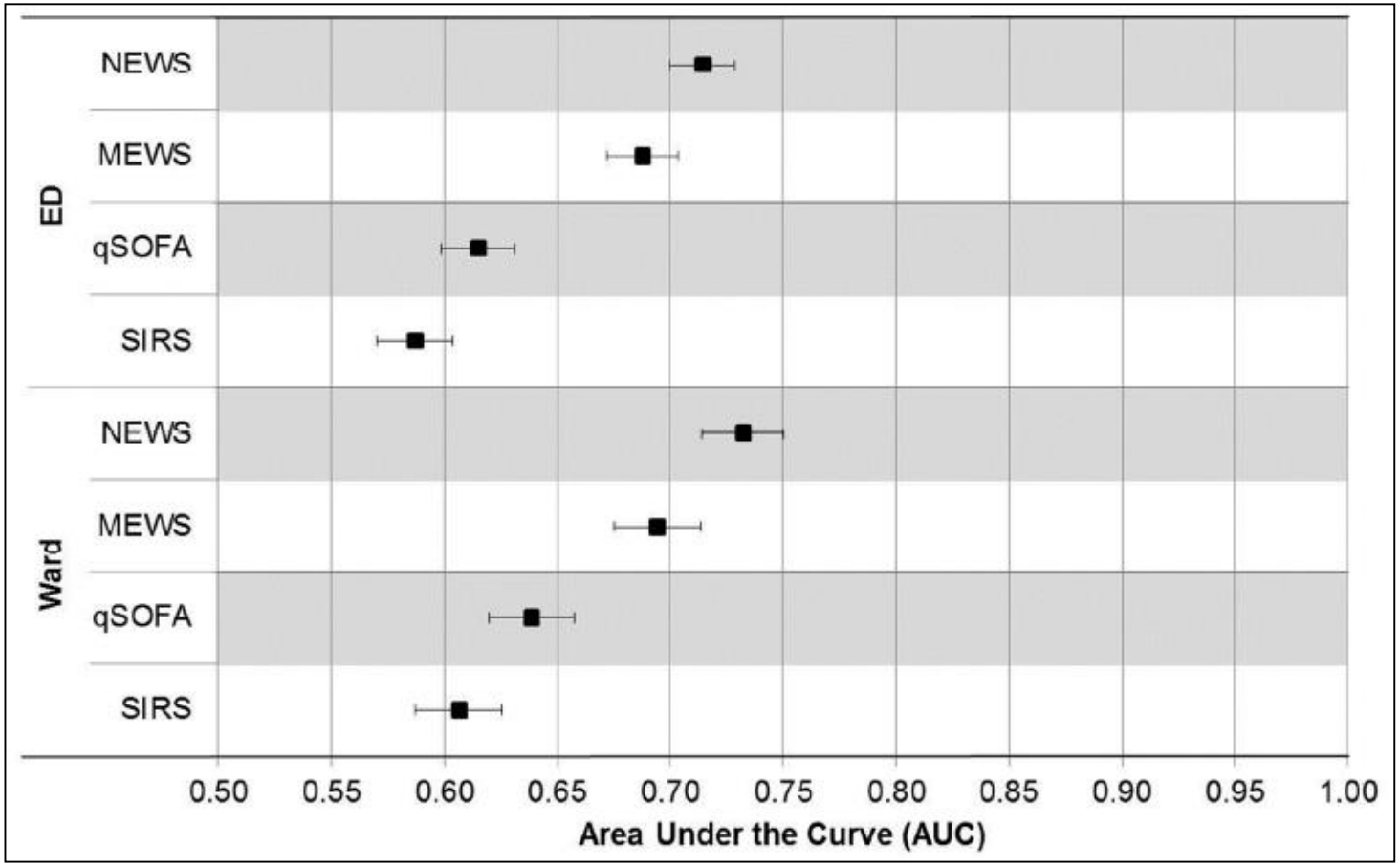
No amber criteria: assess all patients

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]



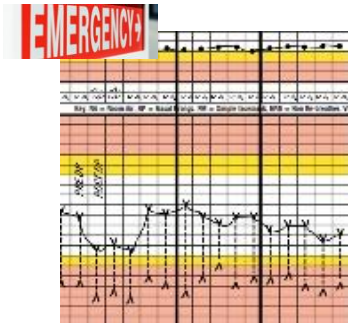
Going forwards?



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