Sepsis Working Together
Community and Secondary Care

Welcome

Twitter #pscsepsis
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Andrew Brent
NICE
Overview of the NICE Sepsis Guidelines 2016

Andrew Brent
Sepsis Clinical Lead, Oxford AHSN
& Oxford University Hospitals NHS Foundation Trust
NICE Sepsis Guidelines 2016

• Background

• Content
  – Scope
  – Definitions
  – Risk stratification
  – Care pathways & bundles

• Implementation
Background

• Department of Health asked NICE “to produce a guideline on Sepsis: the recognition, diagnosis and management of severe sepsis.”

• Focus on diagnosis, assessment and initial management

• Comprehensive critical care guidelines exist
Overall Evidence Quality (NICE)

• “Limited evidence exists for the identification and early management of sepsis in primary care or the emergency department”

• “Only some critical care evidence relevant or interpretable for non-critical-care settings”

• 137 recommendations...
Sepsis guidelines in context

• Link to 22 related NICE guidelines!

• Other guidelines taken into account

• Full alignment of guideline pathways under discussion (eg Feverish illness in under 5s)
The Highlights

Sepsis: recognition, diagnosis and early management

NICE guideline
Published: 13 July 2016
nice.org.uk/guidance/ng51
What do we mean by “sepsis”?

Sepsis is a life threatening condition that arises when a body’s response to infection injures it’s own tissues and organs.

www.sepsistrust.org

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

A syndrome of physiologic, pathologic and biochemical abnormalities induced by infection.

Singer et al. JAMA 2016; 315(8):801-10
SIRS, Sepsis, Severe Sepsis, Septic Shock

**Systemic Inflammatory Response Syndrome (SIRS)** = 2 or more of:

- Temp \(>38\) or \(<36\) °C
- HR \(>90\) min\(^{-1}\)
- RR \(>20\) min\(^{-1}\)
- Acutely altered mental state
- WCC \(<4\) or \(>12 \times 10^9/L\)
- Blood glucose \(>7.7\) mmol/L (no known diabetes)

**Sepsis** = SIRS + evidence of infection

**Severe Sepsis** = Sepsis + end organ dysfunction

**Septic Shock** = Sepsis + hypotension despite adequate fluid resuscitation
Red Flag Sepsis

Sepsis +

- HR > 130
- SBP < 90 (MAP < 65; ↓SBP > 40)
- RR > 25
- SaO₂ < 91%
- Lactate > 2
- AVPU < A (responds only to voice or pain; unresponsive)
- Purpuric rash
Operationalization of Clinical Criteria Identifying Patients With Sepsis and Septic Shock

The baseline Sequential (Sepsis-related) Organ Failure Assessment (SOFA) score should be assumed to be zero unless the patient is known to have preexisting (acute or chronic) organ dysfunction before the onset of infection. qSOFA indicates quick SOFA; MAP, mean arterial pressure.

A qSOFA Variables
- Respiratory rate
- Mental status
- Systolic blood pressure

B SOFA Variables
- $\text{PaO}_2/\text{FiO}_2$ ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count
NICE on Sepsis-3 definitions (qSOFA)

- “qSOFA offers limited explanation on how to confirm or rule out sepsis in general clinical settings.

- qSOFA gives mortality risk but ‘sepsis’ includes all patients with BP<100 mmHg and RR>22.

- But not all these patients need antibiotics.”

Mark Baker, Director, Centre for Guidelines, NICE (July 2016)
How does NICE ‘define’ 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*

**Structured Assessment:**
- Observations & Early Warning Scores

**Consider RISK FACTORS & Indicators of CLINICAL CONCERN**

**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.
How does NICE ‘define’ Sepsis?

• SIRS is dead!

• Simplified terminology: “Sepsis” => severe

• Consideration of risk factors for Sepsis

• Less didactic definition combined with risk stratification

• Structured assessment – Observations & EWS

[Sepsis-3 (qSOFA) definitions not adopted by NICE]
Risk Stratification
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 contact with someone with group A streptococcal infection, have continued vaginal bleeding or an offensive vaginal discharge.

Risk Stratification

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.

SUSPECT SEPSIS

Stratify risk of severe illness and death from sepsis using algorithm appropriate to age and setting
Risk Stratification (age ≥12 years)

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 appearance
- Cyanosis of skin, lips or tongue
- Non-blanching rash of skin

**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 beats 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 patients passed 0.5-1 ml/kg of urine per hour
- Tympanic temperature less than 36°C
- Signs of potential infection, including redness, swelling or discharge at surgical site or breakdown of wound

**Low risk criteria**
- Normal behaviour
- No high risk or moderate to high risk criteria met
**Risk Stratification** (age 5-11 years)

Stratify risk of severe illness and death from sepsis using the risk criteria in the stratification tool for children aged 5-11 years

**High risk criteria**
- Objective evidence of altered behaviour or mental state
- Appears ill to a healthcare professional
- Does not wake or if roused does not stay awake
- Respiratory rate:
  - Aged 5 years: 29 breaths per minute or more
  - Aged 6–7 years: 27 breaths per minute or more
  - Aged 8–11 years: 25 breaths per minute or more
- Oxygen saturation of less than 90% in air or increased oxygen requirement over baseline
- Heart rate:
  - Aged 5 years: 130 beats per minute or more
  - Aged 6–7 years: 120 beats per minute or more
  - Aged 8–11 years: 115 beats per minute or more
- Or heart rate less than 60 beats per minute at any age
- Mottled or ashen appearance
- Cyanosis of skin, lips or tongue
- Non-blanching rash of skin

**Moderate to high risk criteria**
- Not responding normally to social cues
- Decreased activity
- Parent or carer concern that the child is behaving differently from usual
- Respiratory rate:
  - Aged 5 years: 24–28 breaths per minute
  - Aged 6–7 years: 24–26 breaths per minute
  - Aged 8–11 years: 22–24 breaths per minute
- Oxygen saturation of less than 92% in air or increased oxygen requirement over baseline
- Heart rate:
  - Aged 5 years: 120–129 beats per minute
  - Aged 6–7 years: 110–119 beats per minute
  - Aged 8–11 years: 105–114 beats per minute
- Or capillary refill time of 3 seconds or more
- Reduced urine output, or for catheterised patients passed less than 1 ml/kg of urine per hour
- Leg pain
- Cold hands or feet

**Low risk criteria**
- Normal behaviour
- No high risk or moderate to high risk criteria met
Risk Stratification (age <5 years)

Stratify risk of severe illness and death from sepsis using the risk criteria in the stratification tool for children aged under 5 years

**High risk criteria**
- Behaviour:
  - No response to social cues
  - Appears ill to a healthcare professional
  - Does not wake, or if roused does not stay awake
  - Weak high-pitched or continuous cry
  - Heart rate:
    - Aged under 1 year: 160 beats per minute or more
    - Aged 1–2 years: 150 beats per minute or more
    - Aged 3–4 years: 140 beats per minute or more
    - Heart rate less than 60 beats per minute at any age
  - Respiratory rate:
    - Aged under 1 year: 60 breaths per minute or more
    - Aged 1–2 years: 50 breaths per minute or more
    - Aged 3–4 years: 40 breaths per minute or more
  - Grunting
  - Apnoea
  - Oxygen saturation of less than 90% in air or increased oxygen requirement over baseline
  - Mottled or ashen appearance
  - Cyanosis of skin, lips
  - Non-blanching rash
  - Temperature:
    - Less than 36°C
  - Aged under 3 months: 38°C or more

**Moderate to high risk criteria**
- Behaviour:
  - Not responding normally to social cues
  - No smile
  - Wakes only with prolonged stimulation
  - Decreased activity
  - Parent or carer concern that child is behaving differently from usual
- Respiratory rate:
  - Aged under 1 year: 50–59 breaths per minute
  - Aged 1–2 years: 40–49 breaths per minute
  - Aged 3–4 years: 35–39 breaths per minute
  - Oxygen saturation of less than 91% in air or increased oxygen requirement over baseline
  - Nasal flaring
  - Heart rate:
    - Aged under 1 year: 150–159 beats per minute
    - Aged 1–2 years: 140–149 beats per minute
    - Aged 3–4 years: 130–139 beats per minute
  - Capillary refill time of 3 seconds or more
  - Reduced urine output, or for catheterised patients passed less than 1 ml/kg of urine per hour
  - Pale or flushed
  - Pallor of skin, lips or tongue
  - Temperature:
    - Aged 3–6 months: 39°C or more
  - Leg pain
  - Cold hands or feet

**Low risk criteria**
- Responds normally to social cues
- Content or smiles
- Stays awake or awakens quickly
- Strong normal cry or not crying
- No high risk or moderate to high risk criteria met
- Normal colour
Risk Stratification

• Age & context specific tools & algorithms
  – Age: <5y, 5-11y, 12-adult
  – Community, Hospital

• High Risk = Red Flag Sepsis (with minor modifications)

• Moderate risk... difficult...

• Neutropaenic sepsis not included in High Risk
Care Pathways

- Risk stratification defines pathway
Managing suspected sepsis in adults and young people aged 18 years and over - outside an acute hospital setting

**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 appearance
- Cyanosis of skin, lips or tongue
- Non-blanching rash of skin

Any high risk criteria met

Send patient urgently for emergency care (setting with resuscitation facilities)

**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 beats 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 patients passed 0.5-1 ml/kg of urine per hour
- Typanic temperature less than 36°C
- Signs of potential infection, including redness, swelling or discharge at surgical site or breakdown of wound

Can definitive condition be diagnosed and treated in an out of hospital setting?

**Low risk criteria**
- Normal behaviour
- No high risk or moderate to high risk criteria met

Provide information about symptoms to monitor and how to access medical care

Yes

Yes

Treat definitive condition and/or provide information to safety net

No
Managing suspected sepsis in adults and young people aged 18 years and over - in an acute hospital setting

**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 90% (or more than 88% in known chronic obstructive pulmonary disease)
- Pulse rate: 110 beats per minute or above
- Hypotension defined as (SBP < 90 mmHg OR SBP 91-100 mmHg and decrease in SBP (on 2 previous measurements) of 20 mmHg or more)
- Intense diarrhoea or vomiting
- New onset of altered renal function (significant rise in creatinine/urea)
- Hypothermia defined as (rectal or axillary temperature < 35°C)
- Signs of sepsis (diaphoresis, shivering, hypotension, or oliguria)
- Hypoglycaemia defined as (blood glucose < 2.5 mmol/L)
- Abnormal clotting screen

1 high risk criterion

Arrange immediate review by senior clinical decision maker (person authorised to prescribe antibiotics, such as CT3/ST3 and above or advanced nurse practitioners).

Carry out venous blood test for the following:
- Blood gas including glucose and lactate measurement
- Blood culture
- Full blood count
- C-reactive protein
- Urea and electrolytes
- Creatinine
- Clotting screen.

Give intravenous antibiotics without delay, and at least within one hour of identification of high risk criteria.

Give an intravenous antimicrobial from agreed local formulary and in line with local (where available) or national guidelines.

Discuss with consultant.

Lactate > 4 mmol/L OR SBP < 90 mmHg
- Give i.v. fluid (500 ml over less than 15 minutes) without delay
- Refer to critical care

Lactate 2 – 4 mmol/L
- Give i.v. fluid (500 ml over less than 15 minutes) without delay
- Consider i.v. fluids.

Lactate < 2 mmol/L
- 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.

**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
- Episodes of mental confusion (alcohol or drug induced)
- Trauma, surgery or invasive procedures in the last 24 hours
- Respiratory rate: 25-34 breaths per minute
- Heart rate: 91-130 beats per minute (for pregnant women 100-130 beats per minute)
- Hypotension defined as (SBP < 90 mmHg OR SBP 91-100 mmHg and decrease in SBP (on 2 previous measurements) of 20 mmHg or more)
- Intense diarrhoea or vomiting
- New onset of altered renal function (significant rise in creatinine/urea)
- Hypothermia defined as (rectal or axillary temperature < 35°C)
- Signs of sepsis (diaphoresis, shivering, hypotension, or oliguria)
- Hypoglycaemia defined as (blood glucose < 2.5 mmol/L)
- Abnormal clotting screen

2 or more moderate to high risk criteria OR SBP 91-100 mmHg

Clinician to review person’s condition and venous lactate results within 1 hour

Carry out venous blood test for the following:
- Blood gas including lactate measurement
- Blood culture
- Full blood count
- C-reactive protein
- Urea and electrolytes
- Creatinine.

Lactate > 2 mmol/L OR lactate assessed as having AKI = escalate to high risk

Lactate ≤ 2 mmol/L and no AKI

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

If no definitive condition identified, repeat structured assessment at least hourly

Manage definitive condition / infection if diagnosed

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

Clinical assessment and manage according to clinical judgement

**Suspected sepsis** and no high risk or high to moderate risk criteria met

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.
Managing suspected sepsis in children aged under 5 years - in an acute hospital setting

**High risk criteria**
- **Behaviour:**
  - No response to social cues
  - Appears ill to a healthcare professional
  - Does not wake, or if woken does not stay awake
  - Weak high-pitched or continuous cry
  - Restless
- **Heart rate:**
  - Aged under 1 year: 160 beats per minute or more
  - Aged 1-2 years: 150 beats per minute or more
  - Aged 3-4 years: 140 beats per minute or more
- **Respiratory rate:**
  - Aged under 1 year: 60 breaths per minute or more
  - Aged 1-2 years: 50 breaths per minute or more
  - Aged 3-4 years: 40 breaths per minute or more
- **Temperature:**
  - Less than 36°C
  - Aged under 3 months: 36°C or more

**1 high-risk criterion**
- Arrange immediate review by senior clinical decision maker (pediatric or emergency care ST4 or above or equivalent).
- Carry out venous blood test for the following:
  - Blood gas including glucose and lactate measurement
  - Blood culture
  - Full blood count
  - C-reactive protein
  - Urea and electrolytes
  - Creatinine
  - Clotting screen
  - Give i.v. antibiotics without delay, and at least within one hour.
  - Discuss with consultant

**Moderate to high risk criteria**
- **Behaviour:**
  - Not responding normally to social cues
  - No smile
  - Wakes only with prolonged stimulation
  - Decreased activity
  - Parent or carer concerned that child is behaving differently from usual
- **Respiratory rate:**
  - Aged under 1 year: 50-59 breaths per minute
  - Aged 1-2 years: 40-49 breaths per minute
  - Aged 3-4 years: 35-39 breaths per minute
- **Oxygenation:**
  - Oxygen saturation of less than 95% in air or increased oxygen requirement over baseline
  - Nasal flaring
- **Heart rate:**
  - Aged under 1 year: 150-159 beats per minute
  - Aged 1-2 years: 140-149 beats per minute
  - Aged 3-4 years: 130-139 beats per minute
- **Capillary refill time:**
  - 3 seconds or more
- **Inhanced urine output:**
  - or for catheterised patients passage less than 1 ml/kg of urine per hour
  - Tachypnoea
  - High temperature
- **Other:**
  - Altered or pale appearance
  - Cyanosis
  - Difficult to arouse
  - Weak or thin body

**2 or more moderate to high risk criteria OR SBP: 91-100 mmHg**
- Perform tests:
  - Venous blood for blood culture, FBC, CRP, U/E, creatinine, and blood gas for lactate
  - Clinician review and results review within 1 hour
- Lactate > 2 mmol/L OR assessed as having AKI* = escalate to high risk criteria
- Lactate ≤ 2 mmol/L and no AKI*

**Low risk criteria**
- Responds normally to social cues
- Content or smiles
- Wakes away or wakes quickly
- Shows normal activity
- Responds to stimuli or cries
- No high risk or moderate to high risk criteria met

**Clinical assessment and management according to clinical judgement**

- If no definitive condition identified, repeat structured assessment at least hourly
- Ensure review by a senior decision maker within 3 hours for consideration of antibiotics

**Suspected sepsis and no high risk or high to moderate criteria met**
- Manage definitive condition/ infection if diagnosed

*See Acute kidney injury (NICE guideline CG169)*
Care Pathways

- Risk stratification defines pathway
- Inpatient pathways complex and didactic
- Limited evidence to support complexity
- Easy to implement / operationalize?
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 SaO₂ 94-98% (88-92% if risk of T2RF)

• **Blood cultures**

• **Lactate**

• **Monitoring** (e.g. High Risk => Observations every 30 min)

• **Source Identification & Control**

• **Escalation criteria**
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 SaO₂ 94-98% (88-92% if risk of T2RF)

• **Blood cultures**

• **Lactate**

• **Monitoring** *(urine output)*

• **Source Identification & Control**

• **Escalation criteria**
Other aspects of guideline

• Education & Training

• Information & Support for patients & carers

• Recommendations for research

• Evidence Reviewed
Where Now?

Sepsis: recognition, diagnosis and early management

NICE guideline
Published: 13 July 2016
nice.org.uk/guidance/ng51

Applying the guidelines Locally & Regionally
Responsibilities (NICE)

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The application of the recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.
Challenges

• Operationalize the guidelines

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

• Build on progress already made
  – ‘Red Flag’ Sepsis
  – Sepsis Six
Summary

• Lots of good things
  – A national approach
  – Simplified terminology (Sepsis) & less didactic definition
  – Structured assessment and risk stratification
  – Overall consistent with and builds on existing tools and progress

• Some questions and challenges
  – Very poor quality evidence – does this justify some of the complexity?
  – How much does the Amber pathway (moderate risk criteria) add?
  – Neutropaenic sepsis might be better integrated

• Operationalizability is key to improve patient care
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
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Sue Morrish
Sam’s story
An avoidable death of a three-year-old child from sepsis

We have found that had Sam received appropriate care and treatment, he would have survived, and that a lack of appropriate and timely bereavement support compounded the distress caused to his family as a result of the failures in care. We have also found failures in the way that the NHS investigated the events that took place, and that this caused the family a further injustice.
### Sepsis Assessment & Management

**Look out for the signs of sepsis**

A raised temperature (fever) in children is common, but can be scary. Almost all children will recover quickly and without problems. However, a very small proportion may have a serious infection with sepsis (bloodstream infection) that requires urgent treatment in hospital.

This information is designed to help you monitor your child’s condition if they have a raised temperature, so you know when to ask for help and can describe the symptoms. Just tick off any of those symptoms that your child shows, with a note of the date and time, and follow the advice at the top of the page.

For ease of use, the symptoms are split into:
- **Amber**, where medical advice should be sought.
- **Red**, which means you should get the child to hospital quickly – dial 999 if necessary and ask for an ambulance.

Again, we must stress that the great majority of children do not have sepsis. But if you do have concerns and your child seems to be getting worse, even if their temperature falls, act swiftly just in case.

**Find out more**

Detailed information can be found on the NICE website: [www.nice.org.uk/guidance/CG180](http://www.nice.org.uk/guidance/CG180)

The UK Sepsis Trust also has a lot of helpful material at: [www.sepsistrust.org](http://www.sepsistrust.org)

**Email:** info@sepsistrust.org

**Phone:** 0845 006 6253

### Symptoms Checklist

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not responding to cries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very difficult to wake up</td>
</tr>
<tr>
<td></td>
<td>Weak, high-pitched or continuous cry in younger children</td>
</tr>
<tr>
<td></td>
<td>Under children are confused or unusually irritable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breathing</th>
<th>Finding it much harder to breathe than normal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grunting, breathing</td>
</tr>
<tr>
<td></td>
<td>Very fast breathing; more than 60 breaths a minute</td>
</tr>
<tr>
<td></td>
<td>Noisy pauses in breathing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circulation</th>
<th>Very cold hands and feet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature and body</th>
<th>Under 3 months with raised temperature over 38°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The soft spot on an infant’s head is bulging</td>
</tr>
<tr>
<td></td>
<td>Stiff neck, especially when trying to look up and down</td>
</tr>
<tr>
<td></td>
<td>The child has a seizure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vomiting, diarrhoea and hydration</th>
<th>Very thirsty and not able to keep fluids down</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bloody or black ‘coffee ground’ vomit</td>
</tr>
<tr>
<td></td>
<td>Not had a wee for 12 hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin, lips and tongue</th>
<th>Rash that fades when pressed firmly (use a clear glass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unusually pale</td>
<td></td>
</tr>
<tr>
<td>Unusually cold</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not responding normally to family or carers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not smiling</td>
</tr>
<tr>
<td></td>
<td>Difficult to wake up or unusually sleepy</td>
</tr>
<tr>
<td></td>
<td>Not wanting to drink much</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breathing</th>
<th>Noisy breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fast breathing</td>
</tr>
<tr>
<td></td>
<td>Unusually noisy or creaky breathing</td>
</tr>
<tr>
<td></td>
<td>Cough that sounds like a seal barking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circulation</th>
<th>Cold hands and feet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature and body</th>
<th>Raiser temperature for 3 days or more</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not consistent weight on an aim, leg, hand or foot</td>
</tr>
<tr>
<td></td>
<td>Aged 3-4 months with temperature of 38°C or above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vomiting, diarrhoea and hydration</th>
<th>Under 1 year of age – vomiting and/or diarrhoea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>More than 5 watery poos in the last 24 hours</td>
</tr>
<tr>
<td></td>
<td>Has vomited more than twice in last 24 hours</td>
</tr>
<tr>
<td></td>
<td>Has not eaten or drinking much</td>
</tr>
<tr>
<td></td>
<td>Dry mouth</td>
</tr>
<tr>
<td></td>
<td>Only one wet nappy or see in 12 hours</td>
</tr>
</tbody>
</table>
Spoting sepsis
and serious illness in children

Please use this leaflet if you are concerned about your child’s symptoms, especially if their illness seems different to any previous illness they’ve had, or if they are ‘just not right’ (even if their temperature falls).

This information will help you monitor your child’s condition so you know:
- When to ask for help
- Where to go
- How to describe the symptoms

Some (but not all) children with these symptoms are seriously unwell. Ask for an assessment TODAY from a trained health professional!

Contact your GP surgery, call NHS 111, or go to your local Walk-in Centre or Minor Injury Unit.

- Temperature
- Breathing
- Skin, lips & tongue
- Eyes and ears
- Activity & body
- Toxic / Nappy

It’s sometimes hard to be sure about particular signs and symptoms. If you feel that your child may be seriously ill, or if something that concerns you is not on these lists, contact your GP surgery, NHS 111 or dial 999 according to your level of concern.

www.essentialtrust.org
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Celia Ingham Clark

National work to improve
sepsis recognition and management
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Refreshment Break

Twitter: #pscsepsis
Sepsis Working Together
Community and Secondary Care

Welcome back

Twitter: #pscssepsis
Sepsis Working Together
Community and Secondary Care

Facilitated table workshop and feedback

Twitter: #pscsepsis
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Bethan Page
Monitoring progress and improvement
Outcome measurement

How will we know if things have improved?
How will we know if we’ve improved?

Measuring the impact of sepsis improvement programmes has proved difficult because of the changing definitions and the lack of an agreed method for monitoring sepsis.

In order to measure change in a sepsis programme we need to:

1. Define the target population – what’s our definition? Is this a stable population?
2. Monitor processes of care – e.g. time to antibiotics
3. Monitor outcomes of our target population – e.g. mortality, LOS
Approaches used by others

Healthcare Improvement Scotland and UCL Partners have tried two approaches:

• Patients coded with A40/A41 (HES data)

• Patients with blood cultures taken (not just positive blood cultures)

**Scotland:** 30 day mortality for all patients who had a blood culture performed

**UCL Partners:** In some Trusts, review 10+ randomly selected patient records with blood cultures taken and check if severe sepsis/septic shock in 2015 or infection with qSOFA + 2 / NEWS 5 or more in 2016

Scotland found no improvement with blood cultures, but did for A40/A41
HES data options
+ Readily available for all Trusts through the AHSN
+ Range of variables: mortality, LOS, demographics, comorbidities
- Time lag (AHSN is about to get new HES data up to June 2016, 5 years)
- Accuracy and variability of coding between Trusts and over time

Lab tests (e.g. blood cultures)
+ No time lag
+ Isn’t dependent on accuracy of coding
- Would need to collect prospectively, how much work is this to do?
- Is this a stable population? (CQUIN requests blood cultures)
A40/A41 sepsis codes

We have this data for all Trusts at the AHSN. Will be able to update shortly up to June 2016.

*To be considered:*

- Coders commonly code the source of infection. A419 is often used when the cause of infection is unknown. Coding practices vary between Trusts and are changing.

- “Even if there was a drive towards improved coding of sepsis in the UK, there would be no credible baseline to ascertain if improvement efforts have made a difference. By raising awareness of "sepsis", the first change will be an increase in the number of cases with a reduction in the mortality that might well be artificial.” (Inada-Kim et al., 2016)
Hospitalizations for Which Certain Infection Codes Were Listed as a Primary Diagnosis, 2003–2011.

Who are our target population?

• No defined diagnostic test (unlike troponin in acute coronary syndrome or an X ray in a fractured limb)
• In clinical practice we treat those with a “suspicion of sepsis”
• NICE guidelines: Identifying and assessing people with suspected sepsis
• Interventions are aimed at patients where there is “suspicion of sepsis”
• “A successful intervention would see a reduction in later sepsis (however measured) but even in the absence of reliable sepsis definition we could monitor mortality, length of stay and other indices of outcome in a suspicion of sepsis group.” (Inada-Kim et al., 2016)
The Method

- HES data for all trusts in Oxford AHSN
- Matt Inada-Kim developed a list of all ICD-10 codes for bacterial infections. Codes verified by other specialists.
- Filter for all patients with a primary diagnosis for infection when admitted to hospital
- Outcomes: hospital mortality, LOS, readmission
- Find most common diagnosis and those associated with the most deaths.
Suspicion of sepsis (SOS)

SOS: Patients admitted with bacterial infection

*Target population is patients admitted with infection.*

+ Consistent with NICE guidelines and early intervention focus
+ Stable population even if increase in A40/A41 coding
- Accuracy of coding
- Time lag
- Includes some low risk infections

**SOS top 10**

*Track outcomes of the 10 “biggest killers”*

SEPSIS: “Life-threatening organ dysfunction caused by a dysregulated host response to infection”.
Can also track LOS, readmission rate. Potential to track % ICU admission.

Oxford AHSN hospital mortality: Top 10 SOS diagnoses associated with death
What should we track at Oxford AHSN?
(Can track more than one measure)

**HES** (Updated data to June 2016 due very shortly)
- A40/A41
- Suspicion of sepsis (SOS)
- SOS top 10 killers
  - A measure of confirmed sepsis cases? Could we link to NEWS scores?
    - Electronic format? *SOS + NEWS score >5*

**Blood cultures**
- Random sample of blood culture patients? Mortality for these patients.
  - Or check notes, e.g. do they have NEWS 5 or more.

**Process measures need thinking about:** CQUIN data of use here?
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Lunch break

Twitter: #pscssepsis
Welcome back

Twitter: #pscssepsis
Sepsis Working Together
Community and Secondary Care

Andrew Brent
Geoff’s Story
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Peter Watkinson & Andrew Brent
SEND and Sepsis:
Harnessing technology to improve patient care
What’s the problem?
How do we recognize who is at risk?

Tarassenko et al: Centile-based early warning systems derived from statistical distributions of vital signs Resuscitation 2011:82;1013-8
Who needs the information?
Ergonomic, efficient design
Fast, easy data entry
- Clear intuitive display of vital signs

- Blood pressure
- Heart rate
Deteriorating patients identified at a glance

<table>
<thead>
<tr>
<th>Bay/Bed</th>
<th>Patient</th>
<th>Starred</th>
<th>Admission</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side Room 26</td>
<td>Bed 26</td>
<td>✭</td>
<td>30 Sep 2015</td>
<td>3</td>
</tr>
<tr>
<td>Bay A</td>
<td>Bed 04</td>
<td>✭</td>
<td>17 Oct 2015</td>
<td>3</td>
</tr>
<tr>
<td>Side Room 19</td>
<td>Bed 19</td>
<td>✭</td>
<td>27 Sep 2015</td>
<td>1</td>
</tr>
<tr>
<td>Bay F</td>
<td>Bed 06</td>
<td>✭</td>
<td>14 Oct 2015</td>
<td>1</td>
</tr>
<tr>
<td>Side Room 25</td>
<td>Bed 25</td>
<td>✭</td>
<td>11 Oct 2015</td>
<td>1</td>
</tr>
<tr>
<td>Bay C</td>
<td>Bed 05</td>
<td>✭</td>
<td>15 Oct 2015</td>
<td>1</td>
</tr>
</tbody>
</table>
Real-time audit – continuous quality improvement

**Overall Performance**
All observations taken on time this month

- **On Time:** 61%
- **Late:** 39%

**Summary**

- **1 Hourly Obs** (T&T score of 3 or more)
  - **On Time:** 19%

- **4 Hourly Obs** (T&T score of 1-2)
  - **On Time:** 32%

- **12 Hourly Obs** (T&T score of 0)
  - **On Time:** 94%
Proven in practice

- 4 hospitals
- 12 million observations
- 87,000 patients
- No down time
The benefits of good research coupled with good design

- Faster per observation set
- Minimal training
- System Usability Score 77.8
- Improved organizational management
The immediate future
From addition to a multi-dimensional space
SEND – 12 million vital signs to drive improvement in patient recognition
There is no acceptable clinical compromise for digital data
Harnessing data to drive quality: SEND, EPR & Sepsis

Andrew Brent
Infectious Diseases & Medicine Consultant; Oxford AHSN & OUH Sepsis Lead
Time is Life...

Early treatment → improved survival in severe sepsis

---

Kumar et al, Crit Care Med 2006
"Red Flag" Sepsis

Infection +

- HR > 130
- SBP < 90 (MAP < 65; ↓SBP > 40)
- RR > 25
- SaO₂ < 91%
- Lactate > 2
- AVPU < A (responds only to voice or pain; unresponsive)
- Purpuric rash
## Electronic Screening Tool: Adult Emergency Admissions

<table>
<thead>
<tr>
<th>Process</th>
<th>Input Parameters</th>
<th>Tools &amp; Algorithms</th>
<th>Output &amp; Actions</th>
</tr>
</thead>
</table>
| Rapid Nurse Assessment (RNA) | **Observations (SEND)**  
Temp | RR | **Infection concern**  
temp >38°C or could be infection  
**plus** |
| | AVPU | HR | **“Red Flag” present**  
any “Sepsis Red Flag”:  
HR > 130  
RR > 25  
AVPU < A  
SBP < 90  
SaO₂ < 91%  
Lactate > 2  
or  
worried |
| | SaO₂ | BP | **Triggers:**  
Purple ‘Sepsis’ alert on whiteboard to prompt rapid clinician review  
Sepsis Powerplan (see below)  
EPR Alert |
| Venous blood gas (VBG) | Lactate (± creatinine) |
| Assessment | “Are you worried?” (Y/N)  
“Could this be infection?” (Y/N) |

(similar algorithms for paediatrics and for adult inpatients)
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/06/2016</td>
<td>EAU - Day 1 Bed 11</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Collapse query call</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>AV Block</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Self Harm</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Tachycardia</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Chest Pain</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Dizzy/unsteady</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Increasing confusion/agitation</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>SOB</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Extended abdo/vom</td>
<td></td>
</tr>
<tr>
<td>02/06/2016</td>
<td>Mental health issue</td>
<td></td>
</tr>
</tbody>
</table>

**Meds**

- EAU: 2 (R) 1 (S) 1 (CN)
- GH: 9.05 7.18 7.44 6.37 6.22 5.6 0.51 0.01
- MA: 9
- LA: 3
- GH: 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
- MN: 1
- OS: 1
- DR: 8
- RN: 0
Electronic Screening Tool: Adult Emergency Admissions

<table>
<thead>
<tr>
<th>Process</th>
<th>Input Parameters</th>
<th>Tools &amp; Algorithms</th>
<th>Output &amp; Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Nurse Assessment (RNA)</td>
<td>Observations (SEND)</td>
<td>Infection concern&lt;br&gt;temp &gt;38°C or could be infection&lt;br&gt;plus&lt;br&gt;“Red Flag” present&lt;br&gt;any “Sepsis Red Flag”:&lt;br&gt;HR &gt; 130&lt;br&gt;RR &gt; 25&lt;br&gt;AVPU &lt; A&lt;br&gt;SBP &lt; 90&lt;br&gt;SaO₂ &lt; 91%&lt;br&gt;Lactate &gt; 2&lt;br&gt;or&lt;br&gt;worried</td>
<td>Triggers:&lt;br&gt;Purple ‘Sepsis’ alert on whiteboard to prompt rapid clinician review&lt;br&gt;Sepsis Powerplan (see below)&lt;br&gt;EPR Alert</td>
</tr>
<tr>
<td></td>
<td>Venous blood gas (VBG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lactate (± creatinine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Are you worried?” (Y/N)&lt;br&gt;“Could this be infection?” (Y/N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor Review</td>
<td>Rapid Clinical Assessment</td>
<td>Sepsis Powerplan²&lt;br&gt;&lt;br&gt;Within 1h of presentation:&lt;br&gt;Antibiotic Prescription&lt;br&gt;± other elements of Sepsis 6² (fluids, oxygen, BCs, urine output)&lt;br&gt;Or override: “Not Sepsis”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete Clinical Assessment as required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(similar algorithms for paediatrics and for adult inpatients)
Sepsis PowerPlan

This PowerPlan has been launched because there is evidence the patient has Septic Shock. It should be used in conjunction with Trust guidelines for Sepsis.

Please either prescribe antibiotics (and supportive treatment as indicated). Antibiotics should be prescribed in accordance with Trust guidelines to complete the Neutropenic Sepsis PowerPlan below.

Reason if PowerPlan Not Indicated
- Sepsis PowerPlan Not Indicated - Not Sepsis - Alternative Diagnosis
- Sepsis PowerPlan Not Indicated - Active Treatment Not Currently Indicated
- Sepsis PowerPlan Not Indicated - IV Antibiotics Already Given

Suspected Neutropenic Sepsis (Adult) PowerPlan

Medications
- High Alert Oxygen Prescription
- Sodium chloride (Sodium chloride 0.9% BOLUS infusion)

Antimicrobial Injections
- High Alert Aciclovir (Aciclovir injection)
- Amoxicillin (Amoxicillin injection)
- cefTRIAXONE
- Ciprofloxacin (Ciprofloxacin injection)
Sepsis PowerPlan

This PowerPlan has been launched because there is evidence the patient has Septic Shock. It should be used in conjunction with Trust guidelines for Sepsis.

Please either prescribe antibiotics (and supportive treatment as indicated). Antibiotics should be prescribed in accordance with Trust guidelines to complete the Neutropenic Sepsis PowerPlan below.

Reason If PowerPlan Not Indicated
- Sepsis PowerPlan Not Indicated - Not Sepsis - Alternative Diagnosis
- Sepsis PowerPlan Not Indicated - Active Treatment Not Currently Indicated
- Sepsis PowerPlan Not Indicated - IV Antibiotics Already Given

Medications
- High Alert Aciclovir (Aciclovir injection)
- Amoxicillin (Amoxicillin injection)
- cefTRIAXONE
- Ciprofloxacin (Ciprofloxacin injection)

Supportive Treatment
- High Alert Oxygen Prescription
- Sodium chloride (Sodium chloride 0.9% BOLUS infusion)
Microguide App & Sepsis

Desktop version also available via OUH intranet

Similar menu in Paediatric Microguide
Microguide App & Sepsis

Desktop version also available via OUH intranet

Similar menu in Paediatric Microguide
Sepsis PowerPlan

This PowerPlan has been launched because there is evidence the patient is having Sepsis or Sepsis Shock. It should be used in conjunction with Trust guidelines for Sepsis care.

Please either prescribe antibiotics (and supportive treatment as indicated). Antibiotics should be prescribed in accordance with Trust guidelines.

Complete the Neutropenic Sepsis PowerPlan below.

Reason if PowerPlan Not Indicated:
- Sepsis PowerPlan Not Indicated - Not Sepsis - Alternative Diagnosis
- Sepsis PowerPlan Not Indicated - Active Treatment Not Currently Indicated
- Sepsis PowerPlan Not Indicated - IV Antibiotics Already Given

Suspected Neutropenic Sepsis (Adult) PowerPlan

Supportive Treatment:
- High Alert Oxygen Prescription
- Sodium chloride (Sodium chloride 0.9% BOLUS infusion)

Antimicrobial Injections:
- High Alert Aciclovir (Aciclovir injection)
- Amoxicillin (Amoxicillin injection)
- cefTRIAXONE
- Ciprofloxacin (Ciprofloxacin injection)

Details
Sepsis PowerPlan

This PowerPlan has been launched because there is evidence the patient has shocked. It should be used in conjunction with Trust guidelines for Sepsis.

Please either prescribe antibiotics (and supportive treatment as indicated). Antibiotics should be prescribed in accordance with Trust guidelines to complete the Neutropenic Sepsis PowerPlan below.

Reason if PowerPlan Not Indicated:
- Sepsis PowerPlan Not Indicated - Not Sepsis - Alternative Diagnosis
- Sepsis PowerPlan Not Indicated - Active Treatment Not Currently Indicated
- Sepsis PowerPlan Not Indicated - IV Antibiotics Already Given

Suspected Neutropenic Sepsis (Adult) PowerPlan

Supportive Treatment:
- High Alert Oxygen Prescription
- Sodium chloride (Sodium chloride 0.9% Bolus infusion)

Antimicrobial Injections:
- High Alert Aciclovir (Aciclovir injection)
- Amoxicillin (Amoxicillin injection)
- cefTRIAXONE
- Ciprofloxacin (Ciprofloxacin injection)
Awareness & Training, Performance Data Reporting, Feedback & Improvement

Early Recognition

Triage / RNA

Clinical Review

Prompt Treatment

Antibiotics

Electronic Screening Tool

Sepsis PowerPlan
Harnessing data to drive quality:
SEND, EPR & Sepsis

Andrew Brent
Infectious Diseases & Medicine Consultant; Oxford AHSN & OUH Sepsis Lead
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Matt Inada-Kim
Recognising sepsis and taking action
Dialects & Tribes
A Sepsis quality improvement strategy

I beg your pardon?

**Standard English**
I'm going into town today

**Geordie**
I'm ganen doon the toon the day

**Yorkshire**
Ah'm nicely off out t'taan

**South London**
Am gahn dahn tahn todley

**Glasgow**
Am gun uptoon todee

**Afro-Bristolian**
Ahs goiin ter bristle today!

**Serbo-Bradfordian**
I go ter towen terdaay

Matt Inada-Kim, Lead of the National AHSN Sepsis cluster
Chair of the Wessex Sepsis network
Harkness fellow at IHI/Harvard
Consultant Acute Physician, Hampshire Hospitals
Good progress but still a long way to go

Wessex SOS Admissions 2009-14

- SOS Admissions
- Deaths
- Mortality
The Lens of Profound Knowledge

- **System**
  - Interdependence, dynamism of the parts
  - The world is not deterministic
  - Direct, indirect and interactive variables
    - e.g. Sepsis pathway communication

- **Human behavior**
  - Interaction between people
  - Intrinsic versus extrinsic motivation
    - Beliefs, values & assumptions
    - e.g. What is the Will to change?
Since 2009, 13.6% reduction in mortality & 20,871 lives saved in total

<table>
<thead>
<tr>
<th>Year</th>
<th>2009/10</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septicaemia</td>
<td>10.71%</td>
<td>10.15</td>
<td>9.76</td>
<td>9.73</td>
<td>9.06%</td>
</tr>
<tr>
<td>Suspicion of Sepsis</td>
<td>9.83%</td>
<td>9.37</td>
<td>9.08</td>
<td>9.04</td>
<td>8.49%</td>
</tr>
</tbody>
</table>
There is huge variability to how/when patients present

“I feel unwell”

seek help
“Person” problems within cross-silo pathways

**Person**

Variable understanding of acuity

Heterogeneous & Unpredictable

Non-specific presentations
(No ECG, hemiparesis)

The Human Factor
E.g. Teams, Distractions, old medical model
Hierarchies,

**System**

Different languages “Dialects & Tribes”

Dis- integrated organically evolved pathways
Multiple screening tools
Lack of Ownership
Non-evidence based prioritisation of Scarce resources
Non-collaborative

....Handover failures
“System” problems within cross-silo pathways

System

Different languages “Dialects & Tribes”

Dis- integrated pathways evolved in isolation

Multiple tools

Lack of Overall Ownership

Non-evidence based prioritisation of Scarce resources

Non-collaborative

Rarely have patient participation

....Handover failures
Root Causes of Sentinel Events

- Communication
- Assessment
- Physical Environment
- Information Management
- Operative Care
- Care Planning
- Continuum of Care
- Medication Use
- Special Interventions
- Anesthesia Care

Sepsis recognition, admission and intervention is a complex system requiring a sequence of events and interactions to occur reliably, linked by pivotal reliance on communication between and within teams.

If each step is 80% reliable for whole system is $0.8^4 = 41\%$.

Only the final step adds value to the patient.

If each step is 95% reliable then system reliability $= 81\%$.

Just thinking about geographical transfers of care.

Community identification -> Referral -> Ambulance -> Admission

If each step is 80% reliable
A single physiological score to describe the severity of any cause of deterioration. In all parts of the care pathway by 09/16.
- **there is** a standardised assessment system,
- communication model and activation system in healthcare

Amazing Opportunity!

- **No** standardised assessment system,
- communication model and activation system in healthcare
“We know what we should do, sometimes we do it, but it's just not reliable” – trust X

 Definitions
What is sepsis?
What is the “at risk of sepsis” burden?

 Benchmarking
- Measure “at risk of sepsis”
- Establish process/outcomes measurement

 AHSNs
- Curation of resources
- Dynamic Standardisation
- Cross-silo strategies

 Networks/Learning Events
- All Teach, Share & learn

 Individual departments/trusts

 The pursuit of 95% reliability

 Injecting sepsis teams with focused quality improvement capability
1. Seeing the opportunity

How do you tell if someone is sick?

How well do we communicate this?

Is it evidence-based?
2. Realising the potential

- The more aligned we are...
  - The better the
    - Patient
    - Outcomes
3. Appreciating where we are now

- Receptionist, Triage nurse, SHO
- Outreach, SHO, Cons
- F1, SHO, SpR, Cons, Pharmacist, Physio, Ward Clerk/admin, Managers
- Home
- Ambulance 111
- Porters
- ICU
- A&E
- Admissions unit
- Admissions Nurse coordinator, SHO, SpR, Cons
- GP, DN, Receptionist
- GP, friend
- Pharmacy
- Downstream Ward
- Microbiology, Pharmacist, Physio, Ward Clerk/admin, Managers
4. Envisioning the future

- Standardised cross silo communication
5. Doing something about it!

[Diagram showing Venn diagram with Hospital, Ambulance, and Community intersecting]

[Images of a button with "Take Action" and a graph indicating the adoption of new technologies across different groups: Innovators, Early Adopters, Early Majority, Late Majority, Laggards]
GP Sepsis NEWS pilot Dec 2015
Dr Lambert and Matthew Richardson

- With Suspicion of Sepsis (SOS) codes
  (Bethan’s talk)

- 133 Emergency referrals
- 80 SOS
- 40 Analysed

Large city mid HANTS GP practice
SOS caused 2/3 emergency referrals
10.8% mortality
Median 4/6 parameters recorded
Mean 72 years
466 bed days
NEWS in General Practice

- Retrospective service improvement audit of EMIS records for adult patients admitted to acute care between April 2013 and April 2015 with a diagnosis of sepsis to evaluate:
  - How many NEWS parameters were recorded during preceding GP consultations
  - The correlation of NEWS with admission
  - The anticipated workload for GP’s of using NEWS

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>SpO₂</th>
<th>Temp</th>
<th>SBP</th>
<th>HR</th>
<th>AVPU</th>
<th>Total with all parameters complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>20.7%</td>
<td>72.4%</td>
<td>75.9%</td>
<td>75.9%</td>
<td>86.2%</td>
<td>96.6%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Home Visits</td>
<td>21.1%</td>
<td>68.4%</td>
<td>84.2%</td>
<td>89.5%</td>
<td>84.2%</td>
<td>94.7%</td>
<td>21.1%</td>
</tr>
<tr>
<td>Surgery</td>
<td>20.0%</td>
<td>80.0%</td>
<td>60.0%</td>
<td>50.0%</td>
<td>90.0%</td>
<td>100%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

- All consultations - median of **4 of the 6** NEWS parameters recorded (10.8% mortality)
- If RR routinely measured, proportion of patients with complete NEWS would ↑ from 17% to 41%
- Indication that all admitted patients had (or were likely to have) an elevated NEW Score – **good predictor for admission with no additional burden around consultation**
- Recording needs to be simplified to capture data during GP consultations
- Future plans – wider roll out and study around escalation parameters and pathways
NEWS in Care Homes

- 27 PDSA cycles
- 3 pilot sites
- 4 training sessions
- 5 focus groups
- 5 case studies
- Baseline NEWS measurement
<table>
<thead>
<tr>
<th>NEWS ABOVE BASELINE</th>
<th>Suggested Actions</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Observe – likely stable enough to remain at home. Escalate if any clinical concerns / gut feeling</td>
<td>AT LEAST 12 HOURS UNTIL NO CONCERNS</td>
</tr>
<tr>
<td>1</td>
<td>Immediate senior staff review, escalate if concerned. Repeat observations within 4 hours. If next observations = NEWS +1 above normal baseline or more with no obvious cause arrange for GP review within 24 hours. If NEWS is worsening, move to appropriate escalation point</td>
<td>AT LEAST 4 HOURSLY</td>
</tr>
<tr>
<td>2</td>
<td>If no improvement in NEWS (or the same) within 2 hours, seek GP telephone assessment within 2 hours +/- GP review within 6 hours. If NEWS is worsening, move to appropriate escalation point</td>
<td>AT LEAST 2 HOURSLY</td>
</tr>
<tr>
<td>3-4</td>
<td>Repeat observations within 30 minutes. If observations = NEWS +3 above normal baseline or more, seek urgent GP review within 2 hours. If NEWS is worsening, move to appropriate escalation point</td>
<td>AT LEAST EVERY 30 MINUTES</td>
</tr>
<tr>
<td>5-6</td>
<td>Urgent transfer to hospital within 1 hour Refer to GP or use NHS111 to contact Out of Hours</td>
<td>EVERY 15 MINUTES</td>
</tr>
<tr>
<td>7+</td>
<td>Blue light 999 call with transfer to hospital (15 minutes), follow guidance of call handler</td>
<td></td>
</tr>
</tbody>
</table>

- Likely amenable to community management
- May need secondary care assessment e.g. via ambulatory care
- Likely to require prompt hospital admission
Case Study

- 60yr old, MS, Type 2 Diabetes, previous PE, normal baseline NEWS = 1
- Sitting in lounge when suddenly felt nauseous / tired and asked to go to bed
- RN called by carers as this was unusual
- RN carried out a full set of vital signs:
  - HR >181, SBP 100 dropping to 79
  - Sp0₂ 92-93 % from 95%, denied chest pain
  - NEWS above baseline = 6 – 7
- 999 transfer (Δ fast AF)

“The tool gives me the confidence to speak to others about my concerns”

100% of respondents felt the tool had helped them to escalate concerns and achieve earlier assessment/intervention from RN’s, GP’s, OOH or SCAS
Future plans

extended rollout of NEWS to nursing homes/care homes

Training packages for NEWS and observations

GP study around entry point for NEWS and escalation pathway

Roll out of NEWS capability to General Practice

Linking with SCAS and OOH to join up the health economy
OUTCOMES

- Analyse the “Suspicion of sepsis” group
  - Mortality / ICU admissions
  - Length of stay/comorbidities

- Benchmark data over time and share results

Inada-Kim, Page, Maqsood and Vincent 2016
There are a lot of stakeholders
- LMC
- GPs
- Ambulances
- Care homes
- Hospitals
- County council
- Community nursing
- Patients

**Speaking the same language is a game changer**

Small scale change is challenging concept
Model for Improvement creates momentum
Measurement is critical

**Thank you, any questions?**
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Refreshment Break

Twitter: #pscsepsis
Welcome back

Twitter: #pscssepsis
Sepsis Working Together
Community and Secondary Care

Mark Ainsworth Smith
Pre-hospital setting:
how to recognise the signs and symptoms of sepsis
Pre-Hospital Care - Sepsis

Mark Ainsworth-Smith

Consultant Pre-Hospital Care Practitioner, SCAS

September 2016
The types of incident that we attend…
Some patients are easy....

Heart Attack, Stroke, Major Trauma

Sore throat, toothache, minor conditions
We have a dream…..

To have ONE sepsis recognition tool that can be used by:

• Primary Care
• Residential / Care Homes
• Ambulance services

NEWS…..
The benefits of the NEWS scoring system.....

- Consistent language from *call* to *hospital handover*
- Allows us to achieve the most appropriate time-frame for the patient
- Allows us to recognise the deteriorating patient
- Allows us to match the most appropriate ambulance resource to the patient
## Understanding our skill grades

<table>
<thead>
<tr>
<th>Grade/Role</th>
<th>Skills and Responsibilities</th>
</tr>
</thead>
</table>
| **ECA (Band 3)**  
(Emergency Care Assistant)  
Basic life support  
AED  
Primary and secondary survey  
Oxygen therapy  
Entonox  
Dextrose 40% gel  
Aspirin  
Recognition of deteriorating patient |
| **Technician / AAP (Band 4)**  
Intermediate airway management (LMA)  
Manual defibrillation and ECG recognition  
Medicines for life threatening conditions  
Patient assessment and treatment |
| **Paramedic / Ambulance Nurse (Band 5)**  
Advanced Life Support including Intubation  
Cannulation  
IV medicines  
Patient assessment and treatment |
| **ECP (Band 6)**  
(Emergency Care Practitioner)  
Skills as per Paramedic  
Able to treat:  
Chronic conditions  
Minor Injuries  
Minor Illness  
A focus on “see and treat” |
GPs (and other HCPs) have a dedicated telephone number to call for appropriate transport

In Thames Valley this number is:

0300 1239826
Conclusions: Elevated NEWS among unselected prehospital patients is associated with a higher incidence of adverse outcomes. Calculation of prehospital NEWS may facilitate earlier recognition of deteriorating patients, early involvement of senior Emergency Department staff and appropriate critical care.

© 2015 Elsevier Ireland Ltd. All rights reserved.
Currently SCAS crews are using a sepsis recognition tool.
Adult High Risk

Patients who have been in contact with a number of health care professionals or services with no apparent resolution or improvement. Consider escalation to an assessment facility / ED.

Children High Risk

Children that have been seen by an HCP within the previous 24 hours, and have exacerbated or non-improved symptoms. Children under 2 years (Should normally be conveyed to ED or a HCP for face to face assessment).
Are any 2 of the following present?

Temperature: > 38.3 °C or < 36 °C
Respiratory Rate: >20 per minute
Heart Rate: >90 per minute
Acutely confused or reduced conscious level
Glucose: >7.7 mmol/L (unless known diabetes)
Are there any signs of shock?

- Systolic BP: < 90 mmHg
- Respiratory Rate: >25 per minute
- Heart Rate: >130 per minute
- Oxygen saturation: <91%
- Responds only to voice or pain
- Mottled/cold peripheries
- Central capillary refill time: > 2 seconds
- Purpuric rash
- Absent radial pulse

YES

NO
Septic Shock
Administer
Oxygen: 15 L/min via non rebreathing mask
IV Fluids: 250ml boluses of crystalloid to max 2 L
(consider IV anti-biotics if available)
Transfer
Blue light transfer to nearest ED
Pre-alert
Stating “Suspected Septic Shock”
An opportunity.....

We now have ePR across the whole of SCAS.....

SCAS have developed a “beta-version” of a sepsis recognition tool on the ePR devices

This calculates the NEWS (and POPS) scores from the physiological observations entered
### NEWS Score

<table>
<thead>
<tr>
<th>Physiological parameters</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SpO2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplemental oxygen used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Close button]
### Vital Signs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse</td>
<td>87</td>
</tr>
<tr>
<td>Resp Rate</td>
<td>29</td>
</tr>
<tr>
<td>SpO2 (on air)</td>
<td>94</td>
</tr>
<tr>
<td>SpO2 (on oxygen)</td>
<td>98</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>137</td>
</tr>
<tr>
<td>Temperature</td>
<td>38.3</td>
</tr>
<tr>
<td>AVPU</td>
<td>Pain</td>
</tr>
<tr>
<td>POPS Breathing</td>
<td>Stridor</td>
</tr>
<tr>
<td>POPS Other</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Gut Feeling</td>
<td>Looks unwell</td>
</tr>
<tr>
<td>NEWS</td>
<td>10</td>
</tr>
</tbody>
</table>
It is vital that we have one sepsis screening tool that is used right across:

– Primary Care
– Residential / Care homes
– Ambulance Services

Let’s work together NICEly……!
Questions
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Gail Hayward
Sepsis identification in the community
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Amanda Pegden
Fighting sepsis, saving lives,
sharing our journey
“Fighting Sepsis – Saving Lives”
Sharing our journey

Amanda Pegden
Sepsis Working Group
Great Western Hospital NHS Foundation Trust
Objectives

- Sepsis the problem
- What needs to be done
- How to start/what to do
- Results
- Summary
The case that changed my practice

- 2007
- ITU Consultant in Portugal
- Gym Dinner
- Daughters
- 3/52 later admitted to ITU
- Meningococcal septicemia
- Survival but quadri-amputated
My Sepsis Mission

• My motivation to implement change

• What have we done and achieved so far

• Share with you - what to do & how to start
Objectives

- Sepsis the problem
- What needs to be done
- What we are doing
- Results
- Summary
Overwhelming systemic inflammatory response. Driven by the immune system and inflammatory pathways in response to an infection.

“Sepsis is a life-threatening condition that arises when the body’s response to an infection injures its own tissues and organs.

Infections which can give rise to sepsis are common, and include lung infections (pneumonia), urine infections and wound/skin/joint infections.

Sepsis can lead to shock, multiple organ failure and death, especially if not recognized and treated early.” UK sepsis trust
Since 2009, 13.6% reduction in mortality & 20,871 lives saved in total
The Burden of Sepsis

In the UK sepsis is estimated to cost the NHS £2.5 billion

Why is sepsis a problem?...

- Affects around 30 million in the world each year
- Incidence is rising by over 8% each year
- Can affect any speciality, for any age patient
- More than 44,000 deaths in the UK each year

- Kills more than lung cancer....
- ...more than COPD.....
- ...more than breast, bowel, and prostate cancer, HIV and AIDS and RTCs combined...
- ...more likely to die of sepsis than heart attack or stroke.
Objectives

- Sepsis the problem
- What needs to be done
- What we are doing
- Results
- Summary
Sepsis - the problem

• National ED audit 2011

• In Dec. 2012 a GWH mortality review

• ED/AMU sepsis audit – only 1:30

• New ED audit for 2017
Global and National action

- Sepsis recognition and timely treatment - a global issue

- “Surviving Sepsis campaign” launched
  - guidelines 1st published in 2004 & updated in 2012

- Dr. Ron Daniels and UK Sepsis Trust

- UK national CQUINN 2015

- New NICE guidelines July 2016
♦ Objectives

• Sepsis the problem
• What needs to be done
• What we are doing
• Results
• Summary
Sepsis Working Group

Our Values
Service Teamwork Ambition Respect
Sepsis Working Group

In July 2013 we formed a large multi-disciplinary “grassroots” group

- with a front-door leader

- Doctors
- Nurses
- Pharmacists
- Emergency Department Assistants (EDAs)
- Admin staff

- We meet once a month
- We work in different areas of the hospital
- We are all “Sepsis Champions”
What did we do at GWH

1. Sepsis working group – a front door leader
2. Sepsis Champions
3. Sepsis screening tool
4. Sepsis measurement tool
5. Sepsis card for lanyard
6. Sepsis six posters
7. Teaching – all health care staff across the trust
• GWH Sepsis Intranet web page
• Media – hospital and local radio and newspaper
• E-learning module
• SMT inside all medical proformas
• SIRS criteria on obs charts
• Sepsis referral site sepsisrefs@gwh.nhs.uk
Rolling Teaching
  - F1/F2/CMT/Consultants/Grand Round
  - USC Directorate Meeting
  - Nurse teaching – AMU/ED/Wards
  - Regional networking
  - Regional master class
• Please support our trust and get involved with raising awareness!
“Fighting Sepsis – Saving Lives”

Standing up to sepsis
Trust celebrates first anniversary of the lifesaving Sepsis Six

A year after launching the Sepsis Six, staff at the Great Western Hospital in Swindon have seen the number of people dying from the disease drop by nearly 40 per cent.

The Sepsis Six, a set of internationally recognised steps designed to help doctors and nurses identify the symptoms of the disease fast, has played a huge part in lowering mortality rates in sufferers from 68 per cent to just 23 per cent.

Time spent at the Great Western Hospital by sepsis patients has also gone down, with the average stay now one day shorter than it was a year ago.

Staff came together in the autumn to mark the achievements and to celebrate World Sepsis Day.

The special lunchtime event, which was held to raise awareness, included hands-on activities, information stands and even sepsis-themed games.

Guest of honour at the event was 18-year-old Amy Brady, who spent three months in GWH fighting the often-fatal illness.

"The doctors here saved me when I was the sickest person in the hospital. I was on a life support machine for a week as my total organ failure," she said.

"I think it’s absolutely amazing that the hospital is raising awareness of this. Knowing the early symptoms is what will save people’s lives. Sepsis occurs when the body starts attacking its own organs following an internal infection or an infected cut, bite or wound. If it’s not treated quickly, sepsis can lead to multiple organ failure and, in many instances, death."

Amanda Regan, Consultant Physician, said: "I am delighted with the success we have had in tackling sepsis in the last 12 months. The enthusiasm that we have seen from staff has been really inspiring. "The Sepsis Six tool is becoming quickly embedded into the hospital and awareness has improved greatly. More patients have been treated

Know the signs
Spotting sepsis early significantly increases a person’s chances of survival. Things to look out for include:

- A high temperature of over 38°C
- Chills and shivering
- A fast heartbeat

Our Values
Service Teamwork Ambition Respect
Sepsis six workstation
IV fluids- a challenge!
Competitive!
New Venflons – how to insert correctly
Sepsis Simulation
Teaching 2014
Sepsis Competitions
All about people
Our Sepsis Stories
What happened in 2013 to 2014.....

- Rolling **audit** of patients coded as having sepsis:
  - Sepsis six breakdown:
  - Use of SMT/Antibiotic administration/ lactate etc

Positive results

Charitable fund bid successful for a pilot .....
Employment of a sepsis specialist nurse for the trust

- Took up post in March 2014 – full time from May
- Now appointed in a substantive post from 15/07/2015!!!
Sepsis specialist nurse role

• Clinical role – daily front door “trawl” and bleep
• Data collection and analysis
• Regular monthly reports – feedback to SWG/USC/managers/trust board
• Teaching
• Monthly SWG meetings – organising/ minutes
• Development of new initiatives – regional/community/master class
Things we are measured against....

- **All** patients admitted *(to ED, SAU, LAMU or PAU)* with clinical evidence of infection will be screened for **sepsis** *(using the Sepsis 6 Pathway)*.
  - This includes paediatrics, maternity, medical, surgical, orthopaedic.
  - Patients at ‘end-of-life’, those in ‘minors’, and trauma cases are excluded from the audit.

- **All** patients with evidence of severe sepsis or red-flag sepsis will have IV Antibiotics administered within an hour of presenting to GWH.
Objectives

- Sepsis the problem
- What needs to be done
- What we are doing
- Results
- Summary
Our Values
Service Teamwork Ambition Respect
Our CQUINN data

- The use of the Sepsis 6 Pathway has become part of gold standard practice at GWH

- Mortality 63% -> 11%

- LOS has reduced 1 day in the first year—saving of 800 bed days

- Antibiotics in 1 hour 7% -> more than 80%
Savings

- Length of stay
- Bed-day savings >£350,000
- ITU admissions 14% to 5% (in 1st year)
“Fighting Sepsis – Saving Lives”

HSMR has gone from “4th worst to 5th best” in region
(Statistical) lives saved

<table>
<thead>
<tr>
<th></th>
<th>% receiving Antibiotics within an hour of arrival</th>
<th>Number of additional patients receiving antibiotics (compared to 7% baseline)</th>
<th>Number of additional lives saved (Based on NNT=4.19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2014/15</td>
<td>29%</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>Q2 2014/15</td>
<td>49%</td>
<td>84</td>
<td>20</td>
</tr>
<tr>
<td>Q3 2014/15</td>
<td>48%</td>
<td>111</td>
<td>27</td>
</tr>
<tr>
<td>Q4 2014/15</td>
<td>52%</td>
<td>117</td>
<td>30</td>
</tr>
<tr>
<td>2014/15 Total</td>
<td></td>
<td>334</td>
<td><strong>82</strong></td>
</tr>
<tr>
<td>Q1 2015/16</td>
<td>61%</td>
<td>54</td>
<td>13</td>
</tr>
<tr>
<td>Q2 2015/16</td>
<td>64%</td>
<td>114</td>
<td>27</td>
</tr>
<tr>
<td>Q3 2015/16</td>
<td>80%</td>
<td>182</td>
<td>43</td>
</tr>
<tr>
<td>Q4 2015/16</td>
<td>73%</td>
<td>172</td>
<td>41</td>
</tr>
<tr>
<td>2015/16 (estimated)</td>
<td></td>
<td>522</td>
<td><strong>124</strong></td>
</tr>
<tr>
<td>Q1 2016/17</td>
<td>79%</td>
<td>72</td>
<td>17</td>
</tr>
</tbody>
</table>
“Fighting Sepsis – Saving Lives”

223 additional lives saved so far!
INFORMATION FOR HEALTH PROFESSIONALS

SEPSIS IS WHEN THE BODY’S RESPONSE TO INFECTION INJURES ITS OWN TISSUES AND ORGANS.

THINK SEPSIS IF YOUR PATIENT:

• IS TRIGGERING AN EARLY WARNING SCORE
• LOOKS ILL
• HAS ANY SIGNS OF INFECTION

IF LEFT UNTREATED, SEPSIS CAN LEAD TO SHOCK, MULTI-ORGAN FAILURE AND DEATH.

EMAIL: INFO@SEPSISTRUST.ORG FOR MORE INFORMATION

THE UK SEPSIS TRUST
Sepsis kills more than 44,000 people per year. In the UK alone.

Spot it. Treat it. Beat it.

Look for signs of sepsis in every patient where infection is likely.

Our Values
Service Teamwork Ambition Respect
Our Values
Service Teamwork Ambition Respect
• Lisa Penny is currently a sister on AMU; she will be joining the team in October.
• Siobhan Dixey is joining us from ITU in September, and has a background in Acute Stroke.
• Jennifer Harrington is joining us from ITU in September, with a background in Orthopaedic Surgery.
• Vicky Bruch is also joining us from ITU in September, and has a background in Trauma and AMU.
Objectives

• Sepsis the problem
• What needs to be done
• How to start/what to do
• Results
• Summary
Summary

A grassroots front door group has effected a massive change in practice:

- 223 lives have been saved (since May 2014)
  - We speak a common language
  - We have embedded gold standard practice in
    - our care for sepsis at the front door
- We are now developing the same care + AKI across all the ward inpatient areas,
  - including maternity and paediatric areas
- Regional working is now well established
Thank you for your time

Any Questions?

- Amanda.pegden@gwh.nhs.uk
- Nicola.lythell@gwh.nhs.uk
Sepsis Working Together
Community and Secondary Care
Sepsis Working Together
Community and Secondary Care

Questions, Summary and Close
Sepsis Working Together
Community and Secondary Care

Thank you

www.patientsafetyoxford.org