

Sepsis

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One team shared values

A bit about Leicester



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A decorative wavy line at the top of the slide, transitioning from purple on the left to blue, green, yellow, and red on the right.

Aims for today

- Definition of sepsis
 - risk factors
 - what causes sepsis
- Why sepsis is important
 - risk to life
 - long-term effects
- How to recognise sepsis
- The goals in the treatment of sepsis
- Sepsis in the ICU
- Complications of Sepsis

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Definition of Sepsis

- “a life-threatening organ dysfunction caused by a dysregulated host response to infection”
- the body reacting to an infection, causing the immune & blood clotting systems to go haywire and attack the body itself, resulting in damage to vital body tissues

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Working Definition

NICE National Institute for
Health and Care Excellence

- Suspicion of Infection + Organ dysfunction
- Organ dysfunction from vital signs
- “Track and trigger” systems
 - NEWS / EWS
 - SOFA
 - qSOFA
- Used to identify high risk patients

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People at risk of sepsis

- People over 75 / Frail
- Anyone with diabetes
- Weak immune system (disease, drugs, alcohol)
- Recent surgery or indwelling intravenous lines
- Recent serious illness
- Recent pregnancy
- Children under 1 year of age
- Children who have long-term conditions, premature babies

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Infections that cause sepsis

- Most common are:
 - Chest Infection (pneumonia)
 - Perforated bowel (peritonitis)
 - Skin infection (cellulitis or necrotizing fasciitis)
 - Urinary Infection (pyelonephritis)
 - Throat infection (tonsillitis, epiglottitis)
 - Meningitis
 - Infected surgical wounds, lines or catheters

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The Problem



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The Problem



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Sepsis Morbidity

- Half of survivors will suffer psychological problems, PTSD
- Post sepsis syndrome
- Survivors of sepsis can be left with chronic disease (such as kidney failure)
- Limb loss common, especially in younger patients (~10%)
- Cost to UK economy £16 billion

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Recognising Sepsis

“Could it be sepsis?” for any extreme symptom associated with simple infection:

Slurred speech (or any change in mental state)

Extrême shivering or muscle pain

Passing no urine (in a day)

Severe breathlessness

I feel that I might die. Sense of impending doom

Skin mottled, discoloured or non-blanching rash

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Important

- No specific test for sepsis
- High temp may not be present
- Change in mental state very important
- Lives saved by:
 - Prompt identification of those at high risk
 - Rapid treatment with antibiotics, fluid, surgery and ICU when needed

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High Risk Sepsis

Adult Red Flags	Child Red Flags
New delirium or any reduced conscious level	Child difficult to rouse
	Child under 3 months: temperature over 38.0C Child under 5 years: temperature below 36.0C
Not passed urine for over 18 hours	No evidence of urine for over 12 hours (no wet nappy)
High breathing rate, reduced oxygen saturation RR>25/min	High breathing rate or grunting/ stops breathing, reduced oxygen saturation
Very fast heart rate (>130/min) Low blood pressure (systolic <90)	Very fast heart rate or if under 12yr, rate below 60/min Low blood pressure, elevated early warning score
Non-blanching purpuric rash Skin mottled or blue-ish (cyanosis)	Non-blanching purpuric rash Skin mottled or blue-ish (cyanosis)
Known severe immune disorder, Chemotherapy in past 6 weeks	Known severe immune disorder, Chemotherapy in past 6 weeks

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Adult Sepsis Screening and Immediate Action Tool

Complete and file in medical record


 Kettering General Hospital
 NHS Foundation Trust

Name: _____

Date of Birth: _____

Hospital Number: _____

Affix Hospital Label if available

1. At least **one** of the following present?

- ☐ Early Warning Score 3 or more OR
☐ Patient looks unwell OR
☐ Concern regarding acute change in mental state

Y

2. Is the clinical picture suggestive of an infection?

If there is a high probability of a non-infective explanation for clinical features (e.g. AMI, PE, pancreatitis or stroke) then manage as low risk of sepsis

- ☐ Chest
☐ Urinary Tract
☐ Cellulitis, necrotizing fasciitis
☐ Abdominal
☐ Bone or joint
☐ Meningitis
☐ Device related (e.g. catheter, line)
☐ Other, state: _____
☐ Yes, but source unclear

Y

3. At least one red flag present?

 + Assessment MUST allow for patients usual chronic baseline
 + Obstetric patients: use corresponding red MEOWS triggers

- A** ☐ Respiratory rate ≥ 25 /min or more
B ☐ New need for $>40\%$ O_2 to keep saturations over 91% (87% in COPD)
☐ Systolic BP < 91 mmHg or fall of 40 from normal
C ☐ HR > 130 /min
☐ No urine output for 16hrs or UO < 10 ml/hr
D ☐ New onset delirium
☐ Responds only to voice or pain/ unresponsive
E ☐ Non-blanching rash/ mottled/ ashen/ cyanotic
☐ Neutropenia or chemotherapy within last 6 weeks

Low Risk of SEPSIS

Treat to local protocols, review if patient deteriorates. Consider other diagnoses.

Moderate Risk of SEPSIS

Sepsis Likely / Present

- Inform responsible clinician
- Consider Sepsis Six interventions (see overleaf)
- Begin at least hourly observations
- Act on early warning score triggers
- Send appropriate microbiological samples (including blood culture)
- Send blood samples for FBC, CRP, U&E, LFT coagulation, Blood gas (venous/arterial) Glucose, ensure results are reviewed
- Source specific antimicrobial prescribing based on local policy (e.g. 4hr CAP bundle)

 EWS 4 or more AND Lactate ≥ 2 or AKI ≥ 2
 If YES Then treat as RED FLAG SEPSIS
 Time zero = Time of abnormal blood results availability

HIGH Risk of SEPSIS

Red Flag Sepsis

This is a time critical condition, immediate action is required!

Start Sepsis 6 bundle NOW (see overleaf)

- ☐ Inform resident senior doctor
☐ Inform outreach team (ward patients):
 BLEEP LRI 5293 / GH 2808 / LGH 3457
☐ Inform Sepsis Team (ED): CALL # 6826

Time Zero: _____ (ED, time of admission, Ward, time of first red flag)

Target Time: _____ (Time when sepsis six to be complete, Time zero plus 1 hr)

Delivery of Sepsis Six by junior staff must not be delayed. Resident senior doctor review can stop the process on the following grounds:

- ☐ Patient is End of Life
☐ Patient low suspicion of infection
☐ Red Flag due to chronic disease



SURNAME & GRADE SIGNATURE DATE & TIME

PRINT NAME: _____

Title: _____

Date: _____

Time: _____

The Sepsis Six

- To deliver within 1 hour of arrival:
 1. Supplementary O2
 2. Take Blood cultures
 3. Give intravenous antibiotics
 4. Give fluid resuscitation
 5. Measure lactate level
 6. Monitor Urine Output



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Intensive care



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Complications

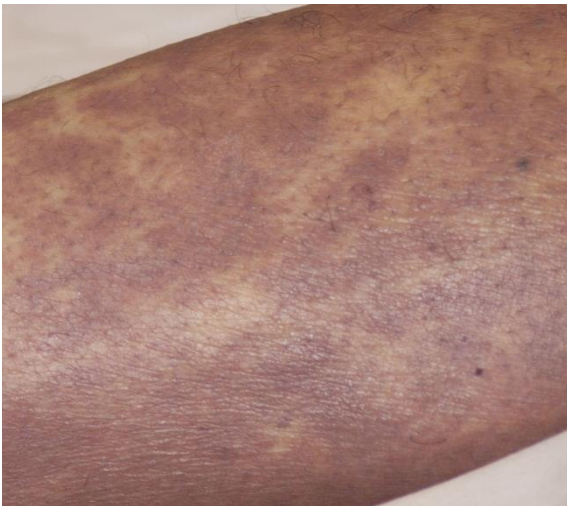
- Lung failure (ARDS)
- Cardiovascular failure
 - Capillary leak, vasodilatation, hypotension
- Disseminated intravascular coagulation (DIC)
- Limb loss
- Kidney failure
- Encephalopathy
- Bone marrow fail



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Limb loss

- Microcirculatory thrombosis
- Noradrenaline use
- Specific limb infection
 - Necrotizing fasciitis



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These images are presented for teaching in the Healthcare context only.

Loss of extremities



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Limb loss



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Necrotizing Fasciitis



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Summary

- Sepsis occurs when the body's normal immune response to infection goes haywire and starts attacking healthy tissues
- Sepsis can cause severe physical disability and psychological problems
- No specific test for sepsis. Suspect sepsis whenever there is an extreme symptom with an infection. Any change in conscious level should be treated seriously. A high **temperature is not essential**.
- Red Flag Sepsis should be treated with the **sepsis six** within 1 hour
- Lives are saved by giving IV antibiotics and fluids quickly, surgery to those that need it quickly, senior medical review and escalation to intensive care for those patients not improving

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Further Information

- The UK Sepsis Trust is a charity aimed at promoting sepsis. Many resources available at www.sepsistrust.org
- NICE guidance on sepsis released in July 2016
 - NICE clinical guideline 51