Sepsis:
Risk stratification tools

NICE National Institute for Health and Care Excellence

How to use these tools

1. Think '**could this be sepsis?**' – use the flowchart on the next page to decide if the person has **suspected sepsis**
2. If **sepsis is suspected**, then use the algorithm appropriate to the person's **age group** and the **setting** (either **out of hospital** or **in hospital**) to:

- stratify their risk (**low**, **moderate to high** or **high**)
- see what care NICE recommends.

Always refer back to the NICE guideline for recommendation details

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Could this be sepsis?

For a person of **any age** with a possible infection:

- Think **could this be sepsis?** if the person presents 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-localised presentations (for example, feeling very unwell).
- Pay particular attention to concerns expressed by the person and their family or carer.
- Take particular care in the assessment of people who might have sepsis if they, or their parents or carers, are unable to give a good history (for example, people with English as a second language or people with communication problems).

Assessment

Assess people with suspected infection to identify:

- possible source of infection
- risk factors for sepsis **(see right-hand box)**
- indicators of clinical of concern such as new onset 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 indications of clinical concern.

Risk factors for 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 (for example, diabetes) or drugs (for example, people receiving long-term 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 or tertiary 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 comorbidities
- 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
- continued vaginal bleeding or an offensive vaginal discharge.

Sepsis not suspected

- no clinical cause for concern
- no risk factors for sepsis.

Use clinical judgement to treat the person, using NICE guidance relevant to their diagnosis when available.

SEPSIS SUSPECTED

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 acute hospital settings.
Parental or carer concern is important and should be acknowledged.

Stratify risk of severe illness and death from sepsis using the tool appropriate to age and setting > > >

Sepsis risk stratification tool: people aged 18 and over in hospital

High risk criteria

- Behaviour:
  - objective evidence of new altered mental state
- Heart rate:
  - more than 130 beats per minute
- Respiratory rate:
  - 25 breaths per minute or more **OR**
  - new need for 40% oxygen or more to maintain saturation more than 92% (or more than 88% in known chronic obstructive pulmonary disease)
- Systolic blood pressure:
  - 90 mmHg or less **OR**
  - 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

- Behaviour:
  - 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
- 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:
  - redness
  - swelling or discharge at surgical site
  - breakdown of wound

Low risk criteria

- Normal behaviour
- No high risk or moderate to high risk criteria met
- No non-blanching rash

1 or more high risk criteria met

Arrange immediate review by senior clinical decision maker (emergency care ST4 or above or equivalent)

Carry out venous blood tests for the following:
- blood gas for glucose and lactate
- blood culture
- full blood count
- C-reactive protein
- urea and electrolytes
- creatinine
- clotting screen

Give intravenous antibiotics without delay (within a maximum of 1 hour)

Discuss with consultant

Lactate over 4 mmol/L **OR** systolic blood pressure less than 90 mmHg

Give intravenous fluid (500 ml over less than 15 mins) without delay and within 1 hour
Discuss with critical care

Lactate 2–4 mmol/L

Give intravenous fluid (bolus injection) without delay and within 1 hour

Lactate less than 2 mmol/L

Consider intravenous fluid (bolus injection) without delay and within 1 hour

Carry out observations at least every 30 minutes or continuous monitoring in emergency department

Consultant to attend (if not already present) if the person does not improve

2 or more moderate to high risk criteria met **OR** systolic blood pressure of 91-100 mmHg

Carry out venous blood tests for the following:
- blood gas for glucose and lactate
- blood culture
- full blood count
- C-reactive protein
- urea and electrolytes
- creatinine
- clotting screen

Clinician review and results review within 1 hour

Lactate over 2 mmol/L **OR** assessed as having acute kidney injury* **escalate to high risk**

Only 1 moderate to high risk criterion met

Clinician review and consider blood tests within 1 hour

Can definitive condition be diagnosed and treated?

YES

NO

Lactate 2 mmol/L or less and no acute kidney injury*

definitive condition diagnosed?

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, no high or high to moderate risk criteria met

Clinical assessment and manage according to clinical judgement

Manage definitive condition. If appropriate, discharge with information depending on setting

*** see NICE's guideline on Acute kidney injury (CG169)**

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