

Sepsis overview

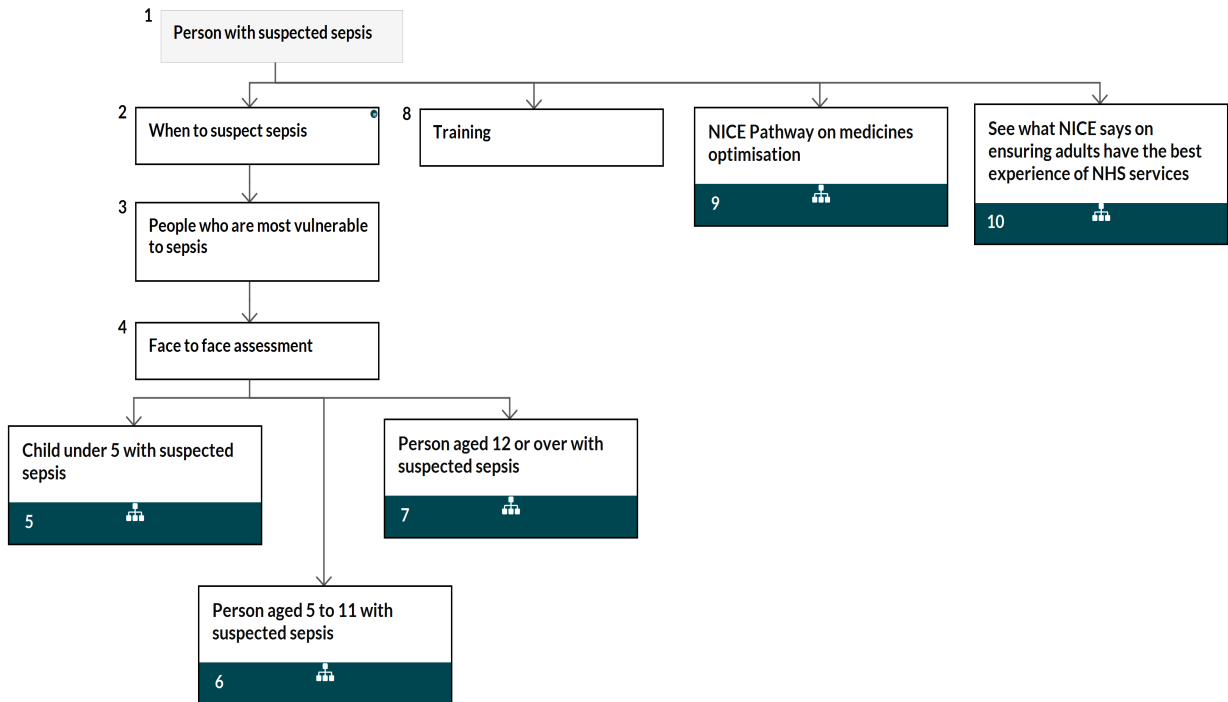
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/sepsis>

NICE Pathway last updated: 03 January 2020

This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



1 Person with suspected sepsis

No additional information

2 When to suspect sepsis

Think 'could this be sepsis?' if a person presents with signs or symptoms that indicate possible infection.

Take into account that people with sepsis may have non-specific, non-localised presentations, for example feeling very unwell, and may not have a high temperature.

Pay particular attention to concerns expressed by the person and their family or carers, for example changes from usual behaviour.

Assess people who might have sepsis with extra care if they cannot give a good history (for example, people with English as a second language or people with communication problems).

Assess people with any suspected infection to identify:

- possible source of infection
- factors that increase risk of sepsis
- any indications of clinical concern, such as new onset abnormalities of behaviour, circulation or respiration.

Identify factors that increase risk of sepsis or indications of clinical concern such as new onset abnormalities of behaviour, circulation or respiration when deciding during a remote assessment whether to offer a face-to-face-assessment and if so, on the urgency of face-to-face assessment.

Use a structured set of observations to assess people in a face-to-face setting to stratify risk (see evaluate the level of risk for under 5s, children aged 5 to 11 or people aged 12 and over) if sepsis is suspected.

Consider using an early warning score (NEWS2 has been endorsed by NHS England) to assess people with suspected sepsis in acute hospital settings.

Suspect neutropenic sepsis in patients having anticancer treatment who become unwell.

Refer patients with suspected neutropenic sepsis immediately for assessment in secondary or tertiary care.

Treat people with neutropenic sepsis in line with NICE's recommendations on [neutropenic sepsis](#).

This guidance covers recognition, diagnosis and early management of sepsis for children and adults. The guidance should be used together with [algorithms](#) organised by age group and treatment location.

MR-proADM test

NICE has published a medtech innovation briefing on the [MR-proADM test for use with clinical deterioration scores in cases of suspected infection](#).

Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

1. Assessment

3 People who are most vulnerable to sepsis

Take into account that people in the groups below are at higher risk of developing sepsis:

- the very young (under 1 year) and older people (over 75 years) or people who are very frail
- people who have impaired immune systems because of illness or drugs, including:
 - people being treated for cancer with chemotherapy (suspect neutropenic sepsis in patients having anticancer treatment who become unwell and treat people with neutropenic sepsis in line with NICE's recommendations on [neutropenic sepsis](#))
 - people who have impaired immune function (for example, people with diabetes, people who have had a splenectomy, or people with sickle cell disease)
 - people taking long-term steroids
 - people receiving taking immunosuppressant drugs to treat non-malignant disorders such as rheumatoid arthritis
- people who have had surgery, or other invasive procedures, in the last 6 weeks
- people with any breach of skin integrity (for example, cuts, burns, blisters or skin infections)
- people who misuse drugs intravenously

- people with indwelling lines or catheters.

Ensure people who are at increased risk of sepsis (for example after surgery) are told before discharge about symptoms that should prompt them to get medical attention and how to get it.

Women of childbearing age

Take into account that women who are pregnant, have given birth or had a termination of pregnancy or miscarriage in the last 6 weeks, are in a high risk group for sepsis. In particular, women who:

- have impaired immune system because of illness or drugs (see [face to face assessment \[See page 6\]](#))
- have gestational diabetes or diabetes or other comorbidities
- needed invasive procedures (for example, caesarean section, forceps delivery, removal of retained products of conception)
- had prolonged rupture of membranes
- have or have been in close contact with people with group A streptococcal infection, for example, scarlet fever
- have continued vaginal bleeding or an offensive vaginal discharge.

Neonates

Take into account the following risk factors for early-onset neonatal infection:

- invasive group B streptococcal infection in a previous baby
- maternal group B streptococcal colonisation, bacteriuria or infection in the current pregnancy
- prelabour rupture of membranes
- preterm birth following spontaneous labour (before 37 weeks' gestation)
- suspected or confirmed rupture of membranes for more than 18 hours in a preterm birth
- intrapartum fever higher than 38°C, or confirmed or suspected chorioamnionitis
- parenteral antibiotic treatment given to the woman for confirmed or suspected invasive bacterial infection (such as septicaemia) at any time during labour, or in the 24-hour periods before and after the birth (this does not refer to intrapartum antibiotic prophylaxis)
- suspected or confirmed infection in another baby in the case of a multiple pregnancy.

See what NICE says on [early-onset neonatal infection](#).

4 Face to face assessment

Assessment and examination

Assess temperature, heart rate, respiratory rate, blood pressure, level of consciousness and oxygen saturation in young people and adults with suspected sepsis.

Assess temperature, heart rate, respiratory rate, level of consciousness, oxygen saturation and capillary refill time in children under 12 years with suspected sepsis.

Measure blood pressure of children under 5 years if heart rate or capillary refill time is abnormal and facilities to measure blood pressure, including a correctly-sized blood pressure cuff, are available.

Measure blood pressure of children aged 5 to 11 years who might have sepsis if facilities to measure blood pressure, including a correctly-sized cuff, are available.

Only measure blood pressure in children under 12 years in community settings if facilities to measure blood pressure, including a correctly-sized cuff, are available and taking a measurement does not cause a delay in assessment or treatment.

Measure oxygen saturation in community settings if equipment is available and taking a measurement does not cause a delay in assessment or treatment.

Examine people with suspected sepsis for mottled or ashen appearance, cyanosis of the skin, lips or tongue, non-blanching rash of the skin, any breach of skin integrity (for example, cuts, burns or skin infections) or other rash indicating potential infection.

Ask the person, parent or carer about frequency of urination in the past 18 hours.

Interpreting findings

Temperature

Do not use a person's temperature as the sole predictor of sepsis.

Do not rely on fever or hypothermia to rule sepsis either in or out.

Ask the person with suspected sepsis and their family or carers about any recent fever or rigors.

Take into account that some groups of people with sepsis may not develop a raised temperature. These include:

- people who are older or very frail
- people having treatment for cancer
- people severely ill with sepsis
- young infants or children.

Take into account that a rise in temperature can be a physiological response for example after surgery or trauma.

Heart rate

Interpret the heart rate of a person with suspected sepsis in context, taking into account that:

- baseline heart rate may be lower in young people and adults who are fit
- baseline heart rate in pregnancy is 10–15 beats per minute more than normal
- older people with an infection may not develop an increased heart rate
- older people may develop a new arrhythmia in response to infection rather than an increased heart rate
- heart rate response may be affected by medicines such as beta-blockers.

Blood pressure

Interpret blood pressure in the context of a person's previous blood pressure, if known. Be aware that the presence of normal blood pressure does not exclude sepsis in children and young people.

Confusion, mental state and cognitive state

Interpret a person's mental state in the context of their normal function and treat changes as being significant.

Be aware that changes in cognitive function may be subtle and assessment should include history from patient and family or carers.

Take into account that changes in cognitive function may present as changes in behaviour or irritability in both children and in adults with dementia.

Take into account that changes in cognitive function in older people may present as acute

changes in functional abilities.

Oxygen saturation

Take into account that if peripheral oxygen saturation is difficult to measure in a person with suspected sepsis, this may indicate poor peripheral circulation because of shock.

5 Child under 5 with suspected sepsis

[See Sepsis / Assessing under 5s with suspected sepsis](#)

6 Person aged 5 to 11 with suspected sepsis

[See Sepsis / Assessing children aged 5 to 11 with suspected sepsis](#)

7 Person aged 12 or over with suspected sepsis

[See Sepsis / Assessing people aged 12 and over with suspected sepsis](#)

8 Training

Ensure all healthcare staff and students involved in assessing people's clinical condition are given regular, appropriate training in identifying people who might have sepsis. This includes primary, community care and hospital staff including those working in care homes

Ensure all healthcare professionals involved in triage or early management are given appropriate, role-specific training in identifying, assessing and managing sepsis. This should include:

- risk stratification strategies
- local protocols for early treatments, including antibiotics and intravenous fluids
- criteria and pathways for escalation in line with their health care setting.

9 NICE Pathway on medicines optimisation

[See Medicines optimisation](#)

10 See what NICE says on ensuring adults have the best experience of NHS services

[See Patient experience in adult NHS services](#)

Glossary

Acute kidney injury

for a definition of acute kidney injury, see what NICE says on [acute kidney injury](#))

Clinician

a medically qualified practitioner who has antibiotic prescribing responsibilities

Critical care

an intensivist or intensive care outreach team, or specialist in intensive care or paediatric intensive care

Emergency medical care

emergency care requires facilities for resuscitation to be available and depending on local services may be emergency department, medical admissions unit and for children may be paediatric ambulatory unit or paediatric medical admissions unit

Senior clinical decision maker

a senior decision maker for people aged 18 years or over should be someone who is authorised to prescribe antibiotics, such as a doctor of grade CT3/ST3 or above or equivalent, such as an advanced nurse practitioner with antibiotic prescribing responsibilities, depending on local arrangements; a senior clinical decision maker for people aged under 17 years is a paediatric or emergency care qualified doctor of grade ST4 or above or equivalent

Senior clinical decision maker for children

(a senior clinical decision maker for people aged under 17 years is a paediatric qualified doctor of grade ST4 or above or equivalent)

Sepsis

sepsis is a life-threatening organ dysfunction due to a dysregulated host response to infection; 'suspected sepsis' is used to indicate people who might have sepsis and require face to face assessment and consideration of urgent intervention

Sources

Sepsis: recognition, diagnosis and early management (2016) NICE guideline NG51

Neutropenic sepsis: prevention and management in people with cancer (2012) NICE guideline CG151

Neonatal infection (early onset): antibiotics for prevention and treatment (2012) NICE guideline CG149

Your responsibility

Guidelines

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do 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.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Medical technologies guidance, diagnostics guidance and interventional procedures guidance

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.