



## Early recognition and treatment of sepsis

This Patient Safety Supplement provides guidance to all healthcare staff regarding the importance of early recognition and treatment of sepsis to improve patient outcomes and consistency in practice. This includes primary care, community and pre-hospital settings, Emergency Department and in-patient settings. It includes specific references to sepsis in children and young people and sepsis in pregnancy. A public awareness campaign on sepsis will follow in early 2024. A [HSE NPSA – Sepsis in Children and Young People](#) (1) has also been issued.

### What is sepsis?

**Sepsis is a time dependent medical emergency** that can be difficult to recognise. It results from an immune response to an infection that the body cannot control, which if not diagnosed and treated promptly can rapidly progress to organ failure, septic shock and death. It has a higher mortality rate than Stroke or Acute Myocardial Infarction (2, 3). Symptoms can be subtle and misleading, mimicking and/or found in the presence of a number of different conditions such as flu and this complicates its timely detection. **Septic shock** is when blood pressure drops and blood flow to vital organs is reduced. Up to four in ten people who develop septic shock die<sup>1</sup>.

### How common is sepsis in Ireland?

There are more than 13,319 sepsis cases documented in Irish acute hospitals (including adult, maternity and paediatric patients), with a mortality rate of 20.3% (2). While some deaths are unavoidable, many may be preventable through earlier sepsis recognition and management.

### What causes sepsis / Common causes of sepsis?

Sepsis is triggered by an infection caused by bacterial, viral or fungal microorganisms and can include parasitic infection. These infections may originate anywhere in the body but the two most common sources are the respiratory tract and the urinary tract. Recent incidence of Invasive Group A Streptococcal Disease (iGAS) - Strep A (Group A streptococcus) has seen an increase in sepsis, particularly in children.

### Who is at risk of sepsis?

Anyone can develop sepsis. As it is related to abnormalities in the immune system, those most at risk are the very elderly, the very young, those who are pregnant, patients with immune conditions including cancer and those on immune suppressing medications. Therefore, immuno-compromised patients should be treated with a high index of suspicion. Sepsis can occur even if people are already on antibiotics or have a viral infection. Treating sepsis is the time critical and urgent life-saving intervention.

### How to identify and manage sepsis?

To ensure that every patient with sepsis is given the best available opportunity to survive, the early detection and recognition of sepsis is essential. Sepsis can develop in any setting, therefore healthcare staff working in all areas of the health service need to know what sepsis is, how it presents and how to manage it promptly and properly.

<sup>1</sup> [Sepsis treatment and recovery - HSE.ie](#)



# Recognising Signs and Symptoms of Sepsis

## Adults

1. Risk of Neutropenia e.g. on chemotherapy/radiotherapy
2. Clinical evidence of NEW ONSET organ dysfunction
3. Systemic Inflammatory Response ( $\geq 2$  SIRS)  $\geq 1$  Comorbidity

### Who needs to get the Sepsis 6 treatment bundle?

**Infection plus any one of the following:**

<p><b>1</b> <b>Risk of Neutropenia e.g. on chemotherapy/radiotherapy</b></p> <p>Patients at risk of neutropenia due to bone marrow failure, autoimmune disorder or treatment including but not limited to chemotherapy and radiotherapy who present unwell</p>		
<p><b>2</b> <b>Clinical evidence of NEW ONSET organ dysfunction such as any of one of the following:</b></p> <ul style="list-style-type: none"> <li>• Acutely altered mental state</li> <li>• Oligo or anuria</li> <li>• Non-blanching rash</li> <li>• Respiratory Rate <math>&gt; 30</math> rpm</li> <li>• Pallor/mottling with prolonged capillary refill</li> <li>• Systolic Blood Pressure <math>&lt; 90</math> mmHg</li> <li>• Heart Rate <math>&gt; 130</math> bpm</li> <li>• Oxygen Saturation <math>&lt; 90\%</math></li> <li>• Other organ dysfunction</li> </ul>		
<p><b>3</b> <b>Systemic Inflammatory Response (<math>\geq 2</math> SIRS) plus <math>\geq 1</math> Comorbidity</b></p> <p><b>SIRS</b> Note - physiological changes should be sustained not transient</p> <ul style="list-style-type: none"> <li>• Respiratory Rate <math>\geq 20</math> breaths/min</li> <li>• Heart Rate <math>&gt; 90</math> beats/min</li> <li>• WCC <math>&lt; 4</math> or <math>&gt; 12 \times 10^9/L</math></li> <li>• Temperature <math>&lt; 36</math> or <math>&gt; 38.3^\circ C</math></li> <li>• Acutely altered mental state</li> <li>• Bedside glucose <math>&gt; 7.7</math>mmol/L (in the absence of diabetes mellitus)</li> </ul> <p><b>Co-morbidities associated with increased mortality in sepsis</b></p> <ul style="list-style-type: none"> <li>• COPD</li> <li>• DM</li> <li>• Frailty</li> <li>• HIV/AIDS</li> <li>• Age <math>\geq 75</math> years</li> <li>• Recent Surgery/Major trauma</li> <li>• Immunosuppressant medications</li> <li>• Chronic liver disease</li> <li>• Cancer</li> <li>• Chronic kidney disease</li> </ul>		

See [Adult Sepsis Form](#) and [In-patient Sepsis Algorithm](#)

## Maternity (including post-partum 42 days)

1.  $\geq 2$  Systemic Inflammatory Response Syndrome (SIRS)
2. Heart rate  $\geq 100$  bpm
3. Foetal heart rate  $> 160$ bpm
4. WCC  $< 4$  or  $> 16.9 \times 10^9/L$
5. Temperature  $< 36^\circ C$  or  $\geq 38^\circ C$
6. Acutely altered mental status

7. Blood Glucose  $> 7.7$ mmols
8. Clinical or biochemically apparent new onset organ dysfunction
9. Pallor/mottling with prolonged capillary refill
10. Oligo or anuria
11. Non-blanching rash
12. Women at risk of neutropenia, autoimmune disorders

See [Maternity Sepsis Form](#)

## Children and Young People

1. **Think sepsis** if a child or young person has signs and symptoms e.g. limb pain, or tachycardia that is not explained by injury, fever /or crying, particularly if they are not improving while on treatment already prescribed for the same complaint
2. During all assessments, **listen to the parent/carer** in determining what is **normal for their child and what may have changed**
3. Remember that risk factors can increase the vulnerability of a child or young person developing sepsis e.g. an infant less than 3 months of age or intellectual disability, note risk factors on Sepsis Form
4. Be aware that sepsis should be considered in children and young people with viral illness who are returning for assessment (from General Practitioner or Emergency Department) and who are not improving
5. **Every time** you interact with the child or young person reconsider if Red/Amber flags or risk factors are present? ( )
6. **Suspected sepsis must be escalated** for review using ISBAR in line with the Sepsis Protocols
7. **At discharge**, children and young people with a suspected or diagnosed infection, should have normal vital signs recorded (unless reviewed with a **Consultant** who agrees with the care plan) and the parents should be given specific sepsis safety advice
8. The Paediatric Sepsis Form **can be initiated by either a nurse or doctor at any time** during the episode of care in the ED or setting of unscheduled care
9. **Sepsis is a time critical** medical emergency. Follow the Sepsis 6 protocol and escalate **without delay – ISBAR**

See [Paediatric Sepsis Form](#)

## Responding to Signs and Symptoms of Sepsis in all Healthcare Settings

- It is important to listen to the patient, family and carer concerns, to take their concerns seriously and during all assessments, listen to the parent/relative/carer in determining **what is normal and what may have changed**
- Consider additional communication supports for non-fluent English speakers or patients/service users with communication difficulties e.g. intellectual disability, dementia
- Use relevant Sepsis Protocols & Documentation to guide decision making
- Escalate when appropriate and without delay to a senior clinician using ISBAR
- Adhere to antimicrobial prescribing guidelines
- If necessary get microbiologist expertise
- Ensure a diagnosis of Sepsis and/or Septic Shock is recorded in the patients' healthcare record
- All relevant clinical staff must do their mandatory sepsis training via [HSELand](#) (requires updating 3 yearly)

## Clinical Judgement

- Clinical Decision Support Tools & National Clinical Guidelines are designed to guide clinical judgement but not replace it
  - If you are concerned about your patient - **escalate** without delay using ISBAR
  - Clinical decisions and therapeutic options should be discussed with a senior clinician on a case-by-case basis as necessary and documented in the healthcare record
  - When sepsis is suspected, commence sepsis protocols

## Primary Care, Community Care and Pre-hospital healthcare staff (e.g. GP, Residential Care, NAS)

- **Sepsis is a medical emergency – think ‘Could this be Sepsis’**
- Vital signs are "vital"- **check all six** - Heart Rate/ Respiratory Rate /Mental state/ Blood Pressure/Oxygen saturation/ Temperature
- Adopt a sepsis "**rule out**" rather than "**rule in**" strategy for patients with infection
- If you suspect sepsis refer urgently
- Sepsis may present with non-specific presentations and can have normal or lower than expected temperature
- When referring to secondary care - communicate concern to ambulance service and colleagues, using the words: "**SUSPECTED SEPSIS**"
- [NICE guidelines](#)  
Further Irish guidance for GPs to be issued Q1 2024
- [Antibiotic Prescribing](#) - Use the HSE Antimicrobial Prescribing and Stewardship Guidance
- National Ambulance Service (NAS) to follow Clinical Practice Guidelines for Sepsis



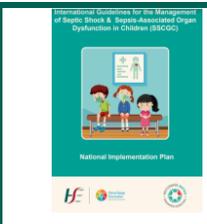
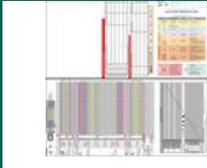
## Emergency Departments and Urgent Care

- Any delay in recognising and treating sepsis can be detrimental therefore timely intervention is critical. Overcrowding and delays in episodes of care will pose a risk to patients of any age
- In adults (>16yrs), follow the Manchester Triage System (MTS) and in Children (<16yrs) the Irish Children's Triage System (ICTS) assign a Category 1 for Septic Shock & Category 2 where Sepsis is suspected.
- From the first presentation or triage, and throughout the patient's episode of care ask 'Could this be Sepsis?'
- If a patient has signs and symptoms of infection and meets one or more of the sepsis at risk criteria (adults) or red/amber flags (children) initiate sepsis protocol. The relevant sepsis forms should be easily accessible (see references).
- Commence on a sepsis form for immediate review – and escalate using ISBAR
- Remember to record baseline (Time ZERO)
- Commence and follow the Sepsis 6 Bundle
- Use EM EWS for adults and IMEWS for obstetric patients in EDs
- Where sepsis is suspected but not confirmed, do not stop fully investigating

## In Hospital

- All in-patients must be on an early warning system i.e., Irish National Early Warning Score (INEWS V2), Irish Maternity Early Warning Score (IMEWS) or Paediatric Early Warning Score (PEWS)
- These observation tools facilitate early recognition of sepsis or deterioration of any patient
- In any healthcare setting '**Think Sepsis**' and commence the Sepsis 6 where sepsis is suspected
- Escalate and treat the patient as necessary
- Document sepsis/septic shock in healthcare record, including the GP discharge letter

## What tools are available to support us to identify and manage sepsis?

	<a href="#">Sepsis Management For Adults (including Maternity) National Clinical Guideline No 26</a>		<a href="#">International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children (SSCGC) National Implementation Plan 2021 HSE</a>
	Emergency Medicine Early Warning System <a href="#">EMEWS</a>		Irish Maternity Early Warning System <a href="#">IMEWS</a>
	Irish Paediatric Early Warning System <a href="#">PEWS</a>		Irish National Early Warning System <a href="#">INEWS v2</a>



## Sepsis Prevention Strategies

One of the most important sepsis prevention strategies is to reduce the likelihood of infection. Steps that can be taken to prevent infection include:

- Completing childhood vaccination schedules
- Vaccination programmes for all vulnerable groups including vulnerable adults, those who are pregnant & children including vaccinations against;
  - [Haemophilus Influenza Type B, Influenza](#)
  - [COVID-19](#)
  - [Pneumococcal Disease](#)
  - [Meningococcal Disease](#)
  - [Information on vaccines recommended during pregnancy can be assessed here](#)
  - Varicella vaccination prior to pregnancy recommended by the National Immunisation Advisory Committee (NIAC)
- Appropriate chronic disease management
- In Maternity - Adhering to national guidelines regarding Group B Streptococcal in pregnancy and at induction of labour
- Breastfeeding is an important and effective source of protection against developing infection in very young infants
- Good infection control practices
- Effective wound care management
- Catheter use only where necessary and good catheter hygiene
- Initiatives aimed at reducing Healthcare Associated Infections & Antimicrobial Resistance

## What initiatives/supports are available?

- [National Clinical Programme for Sepsis](#)
- Public Awareness Campaign planned for February 2024
- National Sepsis Report 2022 – being finalised December 2023
- Mandatory Adult and Paediatric Sepsis Training on [HSELand](#)
- [Adult, Maternity and Paediatric Sepsis leaflet for GPs](#)

## References

1. [HSE NPSA Safety Alert – Sepsis in Children and Young People](#)
2. [Sepsis Management for Adults \(including Maternity\) National Clinical Guideline No 26](#)
3. [HSE National Sepsis Report 2021](#)

## This Patient Safety Supplement was developed by:

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- HSE Acute Operations
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- With input and commentary from National Ambulance Service (NAS) and a number of clinical programmes including National Women and Infants Health Programme (NWIHP), Primary Care and Emergency Medicine (ED)

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