TITLE

Adult Sepsis: General Practice Update

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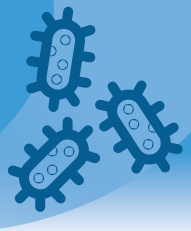

OVERVIEW

This General Practice Update (GPU) is a collaboration between the Health Service Executive (HSE) National Clinical Programme for Sepsis and the Irish College of GPs (ICGP).

Sepsis is a time dependent medical emergency which results from a dysregulated immune response to an infection. The diagnosis is based on the presence of a suite of symptoms and signs supported by investigations in secondary care. If not diagnosed and treated promptly it can rapidly progress to organ failure, septic shock, and death. The recent National Sepsis report identifies six processes that 'must occur to give a person the best opportunity to survive'. Included among these is the early recognition of sepsis with timely escalation to medical review.

It is estimated that 70–80% of sepsis arises in the community. General practitioners (GPs) have a unique opportunity, and face unique challenges, for prompt recognition and referral of patients with suspected sepsis. There is huge variability in the clinical presentation of sepsis in primary care and recognising it at an early stage among the huge number of uncomplicated infections is crucial to improve outcomes.

AIMS OF DOCUMENT

This GPU aims to promote sepsis awareness in primary care and to promote vaccination as an essential part of sepsis prevention. This document aims to assist GPs in the detection, assessment, and early management of suspected sepsis and is limited to people 16 years or over who are not or have not recently been pregnant i.e. not in the 42 days after giving birth. Clinical judgement is required after miscarriage or termination because there is large inter individual variability in the time taken for vital signs to return to pre pregnancy physiological levels, which is largely dependent on the duration of gestation.

SUMMARY

- Prevention: The most effective way to reduce morbidity and mortality from sepsis is by prevention e.g. vaccination.
- Think '***could this be sepsis?***' if a person presents non-specifically unwell or with symptoms or signs that indicate possible infection, even if their temperature is normal.
- Patient assessment for sepsis should consider the risk factors for sepsis e.g. immunosuppression, extremes of age, recent surgery.
- Assess for any indication of organ dysfunction and attempt to identify the source of infection when evaluating patients with suspected sepsis.
- Vital signs are "vital". Check all SIX; Heart rate, Systolic blood pressure, Respiratory rate, Oxygen saturation, Temperature and Level of consciousness.
- ***"Do not delay"*** if sepsis is suspected, transfer to an acute hospital urgently and consider sending a pre-alert.
- Consider patient values and preferences in your clinical decision making especially in end-of-life care. The rationale for a decision not to escalate care should be carefully considered and documented.
- Communicate appropriately with ambulance and secondary care using the words "suspected sepsis" and share the findings of your physiological assessment i.e. vital sign measurements and likely source of infection.
- ***Safety net*** patients where there is no current suspicion of sepsis: ideally written and verbal.

JUMP TO...

Patient Assessment in Primary Care

Risk Stratification

Management of Sepsis in Primary Care

ALGORITHM FOR MANAGEMENT OF ADULT SEPSIS IN GENERAL PRACTICE*

** For use as an adjunct to decision making and does not replace clinical judgement.*

Clinical Risk Factors that increase the risk of Adult Sepsis

- Age **≥75 years**
- **Frailty**
- **Immunosuppressive medications:** Chemotherapy long term steroids/ biologics/ immunomodulator drugs
- **Surgery** or other invasive procedure in the **past 6 weeks**
- **Impaired immune function** e.g. malignancy, splenectomy, poorly controlled HIV, bone marrow suppression/failure
- **Diabetes, chronic liver, kidney, heart or lung disease**
- Any **breach of skin integrity** (for example, cuts, burns, blisters, or skin infections), indwelling lines or catheters
- Alcohol dependency/ Intravenous drug misuse
- Socioeconomic deprivation and learning disabilities

Patient presents non-specifically unwell/ clinical suspicion of infection

YES ↓

THINK: "Could this be sepsis?"

↓

HISTORY

Take a thorough history to identify the focus of infection, rapidity of decline and potential risk factors for sepsis.

↓

EXAMINATION

Carry out and document a thorough clinical examination looking for the potential source of infection and for signs of acute physiological deterioration. In addition, examine people for:

- ☐ mottled or ashen appearance
- ☐ cyanosis of the skin, lips or tongue
- ☐ non-blanching rash or other rash indicating potential infection

↓

VITAL SIGNS

Measure and document all **SIX**

1. Respiratory rate (RR)
2. Oxygen saturations (SpO2)
3. Heart rate (HR)
4. Systolic blood pressure (SBP)
5. Temperature
6. Level of consciousness

→

Any MODERATE-HIGH criteria present?

- ☐ Family report abnormal behaviour or mental state
- ☐ New reduction in functional ability
- ☐ RR 21–24 bpm
- ☐ Systolic BP 91–100mmHg
- ☐ HR 91–130 or new onset arrythmia
- ☐ Not passed urine in 12–18 hrs
- ☐ Temperature <36°

NO →

No current suspicion of sepsis

SAFETY-NETTING*

- Give clear and concise information about sepsis signs and symptoms
- Advise how/where to get **URGENT** help
- Should be written, verbal and documented

**Safety netting is a vital part of a sepsis aware consultation.*

YES ↓

Use clinical judgement to decide whether the patient can be safely managed in the community.

Can the patient be safely treated outside of hospital?

YES →

NO ↓

NO ←

Any HIGH RISK criteria present?

- ☐ Objective evidence of altered mental state
- ☐ Respiratory Rate ≥25/min
- ☐ New need for O2 to keep SpO2 >92% (>88% COPD)
- ☐ Systolic BP ≤90mmHg (or a drop of >40mmHg)
- ☐ Heart Rate >130 bpm
- ☐ Non-blanching rash/mottled/ cyanosis/ashen appearance
- ☐ Not passed urine in 18 hours

YES →

"SUSPECTED SEPSIS"

- **DO NOT DELAY** – transfer the patient **URGENTLY** to an acute hospital by the quickest route possible
- Clearly say **"suspected sepsis"** to the ambulance service and communicate the 6 vital sign measurements
- Clearly document **"suspected sepsis"** on referral letters including the 6 vital signs
- Consider pre-alerting the ED

Adapted from NICE Guideline [NG51]: Suspected sepsis: recognition, diagnosis and early management. London: National Institute of Clinical Excellence; 2016. Available here [permission sought]

Adult Sepsis: General Practice Update – EVIDENCE UPDATES

CITING GENERAL PRACTICE UPDATES

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DISCLAIMER AND WAIVER OF LIABILITY

This General Practice Update (GPU) has been developed on behalf of the Quality and Safety in Practice (QSiP) committee following a careful review of the evidence available at the time of publication. The purpose of this update is to set out evidence based current practice in this area and does not replace clinical judgment. This update is an education tool to assist the GP in providing care for their patient. This is a general update, and it is acknowledged that there will always be particular circumstances where it may be neither possible nor appropriate to follow this document, for example due to resource availability. GPUs are not policy documents. Every effort has been made to ensure the accuracy and updating of the content; however errors and omissions may occur, especially as the evidence changes and clinical practice evolves.

EVIDENCE SUMMARY

GPUs are produced after a review of the literature of the relevant topic area. The aim is to summarise the best available evidence in the context of Irish General Practice. Systematic review evidence is presented where possible.

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CONFLICTS OF INTEREST

None declared at time of publication.

LIST OF ABBREVIATIONS

AMRIC	Antimicrobial Resistance and Infection Control
CDC	Centres for Disease Control and Prevention
CDM	Chronic Disease Management
ED	Emergency Department
EWS	Early Warning Scores
GP	General Practitioner
GPU	General Practice Update
HR	Heart Rate
HSE	Health Service Executive
ICGP	Irish College of GPs
ICU	Intensive Care Unit
IM	Intramuscular
INEWS	Irish National Early Warning System
IO	Intraosseous
IV	Intravenous
NEWS2	National Early Warning System 2
NICE	National Institute for Health & Care Excellence
PHECC	Prehospital Emergency Care Council
PSS	Post-Sepsis Syndrome
PTSD	Post-Traumatic Stress Disorder
QOL	Quality of Life
RCGP	Royal College of General Practitioners
RR	Respiratory Rate
SBP	Systolic Blood Pressure
SpO2	Oxygen Saturations
WHO	World Health Organisation

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1.0 INTRODUCTION

1.1 Background

Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection and is the primary cause of death from infection. There is a complex interplay between the microbe and host resulting in an abnormal immune response with collateral damage and death of host cells and tissues.[1] Sepsis can be caused by any micro-organism; bacteria, virus, fungus or parasite.[2]

Sepsis is a time dependent medical emergency[3] which can be difficult to recognise, especially in primary care. Without timely treatment, sepsis can rapidly lead to tissue damage, organ failure, and death. In patients with sepsis, early intensive treatment increases the chance of survival and every hour that treatment is delayed increases mortality with septic shock.[3–7] Sepsis survivors frequently experience long-term physical, functional and cognitive impairment, resulting in significant social and economic impacts.[8, 9]

National sepsis guidelines describe the secondary care pathways for every patient with suspected sepsis in Ireland[10, 11] and have been widely implemented. In the primary care setting, where acute infection is a common reason for presentation[12, 13] there are currently no national sepsis guidelines.

1.2 Aims of the document

This document is intended to support general practitioners (GPs) in their decision making, it is not intended to replace clinical judgement.

It aims to:

- promote vaccination as an essential part of sepsis prevention.
- increase sepsis awareness in primary care.
- assist GPs in the detection, assessment, and early management of suspected sepsis.

Early detection of sepsis in children and pregnant women is identified by different physiological parameters, symptoms, and signs to those of adult non-pregnant patients and is beyond the scope of this document.

Formalisation of prehospital sepsis care in Ireland is in its infancy, it is acknowledged that there is a need to undertake validation studies to determine whether prehospital sepsis screening tools confer significant clinical benefit. This document serves as a starting point and it identifies current available screening tools and guidelines, some of which are secondary care based and not validated in primary care.

1.3 Epidemiology

It is estimated that 20% of global deaths are caused by sepsis. The World Health Organization (WHO) statistics indicate that there were 48.9 million cases of sepsis worldwide in 2017, with 11 million deaths.[14] The epidemiology of community-based sepsis is not well understood[15] and there is a lack of reliable sepsis incidence and prevalence data from Irish primary care. Community onset sepsis is however acknowledged as a substantial public health problem.[16–18] The Centres for Disease Control and Prevention (CDC) have identified that 70–80% of cases of sepsis arise in the community.[19, 20]

The National Sepsis Report states that in 2022, sepsis and septic shock was documented in 13,712 non-maternity adults in Ireland. These patients had a mortality rate of 23.3% and the average length of hospital stay was 23 days. Compared with 2021, there was a 10.1% increase in documented cases of sepsis and septic shock with an 8.1% relative increase in associated in-hospital crude mortality.[11]

The average age of patients with sepsis in Ireland in 2021 was in the mid-seventies and they had, on average, two or more co-morbidities.[21] Sepsis is more common in men than in women[22] and peaks in mortality occur in the winter season corresponding with the higher incidence of respiratory tract infections.[23]

1.4 Common sources of sepsis

Respiratory, gastrointestinal, genitourinary, and skin or soft tissue infections are the most common sources of sepsis, accounting for more than 80% of all cases.[24] Bacteria are the predominant pathogens implicated in sepsis.[25] Viral aetiology is a common cause of sepsis which has become more evident in the context of the recent COVID-19 pandemic,[26] almost any virus can cause sepsis.[27] Fungal[28] and parasitic[29] infections are uncommon in the Irish setting.

2.0 PATIENT ASSESSMENT IN PRIMARY CARE

GPs have a unique opportunity, with unique challenges, for prompt recognition and referral of patients with suspected sepsis. There is huge variability in the clinical presentation of sepsis in primary care. GPs in Ireland undertake 21 million routine consultations, and more than 1 million 'out-of-hours' consultations annually.[30] Recognising sepsis at an early stage among the large number of uncomplicated infections is difficult. Sepsis may not be present or may not be diagnosed on an initial presentation and may not become evident until the patient's clinical condition evolves further.[31] The absence of validated primary care sepsis guidelines, time constraints[30] and an aging population with complex medical needs add to the challenge of early sepsis detection for GPs. National guidelines recognise that there is no single test that confirms the presence of sepsis but rather the diagnosis is based on the presence of a suite of symptoms and signs supported by tests and investigations performed in secondary care.[31]

2.1 Risk Factors

Recognition of risk factors for developing sepsis is central to any sepsis assessment.

These risk factors are cumulative.

The clinical risk factors that increase the risk of adult sepsis are outlined in Table 1, these risks are cumulative.[32] Extra caution should be applied to patients who develop deterioration due to infection and who have one or more risk factors.

Table 1*: Clinical Risk Factors that increase the risk of Adult Sepsis.*

CATEGORY	RISK FACTOR
Demographic features	Age >75 years[11, 33]
	Frailty*[33]
	Socioeconomic deprivation[26]
	Learning disabilities[34, 35]
Co-morbidities	Diabetes[33]
	Chronic liver, kidney, heart, or lung disease[11]
	Impaired immune function e.g. malignancy, splenectomy, poorly controlled HIV, bone marrow suppression/failure[33]
	Immunosuppressant medications: chemotherapy, long-term steroids, biologics, immunomodulator drugs[33]
Breach of skin integrity	Recent surgery or invasive procedures in the past 6 weeks[33]
	Cuts, burns, blisters, or skin infections[33]
	Indwelling lines or catheters[33]
Others	Alcohol dependency[11]
	Intravenous drug misuse[33]

* Frailty is described as a distinctive health state related to the ageing process in which multiple body systems gradually lose their in-built reserves.[36]

2.2 When to suspect sepsis

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

During patient assessment:

- Be aware that sepsis may present with vague, common and non-specific symptoms and patients may not have a fever.[33]
- Pay particular attention to concerns expressed by the person and their family or carers.[33] Changes may be subtle and not clear to those who have not known the patient previously.
- Take extra care with patients who cannot give a good history[33] e.g. people with English as a second language or people with communication problems e.g. intellectual disability,[34] severe psychiatric illness,[37] or dementia.
- Clinician intuition or physician "gut-feeling" that the patient is at risk of deterioration should be considered. Trust your clinical instinct.
- For patients in care or nursing homes consider "soft signs"[38] of potential deterioration e.g. lethargy, withdrawal, agitation, poor appetite, decreased mobility and reduced fluid intake. See *here*[39] for further information.

2.3 History

Carry out and document a thorough history to identify the focus of infection, rapidity of decline and potential risk factors for sepsis.

- **Presenting complaint**: detail the history of the acute presentation and subsequent clinical course. Patient deterioration on antibiotic therapy and repeat visits for the same illness should heighten suspicion of sepsis.
- **Past medical history:** identify and document the presence/absence of any risk factors.
- **Drug History:** including history of recent chemotherapy or biologic agents.
- **Systems review:**
  - Ask the person, family member or carer how often the person urinated in the past 12–18 hours.
  - Ask about any recent fevers and/or rigors.[33]
  - Establish baseline cognition/functional status – ascertain if any new onset of decline in functional status, altered behaviour or mental state.

2.4 Examination

Carry out and document a thorough clinical examination looking for the potential source of infection and for signs of acute physiological deterioration.

In addition, specifically look for:[33]

- Mottled or ashen appearance.
- Cyanosis of the skin, lips, or tongue.
- Non-blanching rash or other rash indicating potential infection.
- Any break in skin integrity (for example, cuts, burns or skin infections).
- Any source of infection that may require an emergency procedure to control the source of sepsis e.g. drainage of an abscess, debridement for suspected necrotising fasciitis.

2.5 Vital signs

Vital sign measurement is key to detection of early sepsis.
"Measure and Document"

It is recommended that patients at risk of deterioration and/or in whom sepsis is suspected are risk assessed using a structured set of observations.[33, 40] It is acknowledged that this recommendation is not validated in primary care.

Sepsis is a time-crucial medical emergency and is usually preceded by measurable physiological abnormalities i.e. vital sign abnormalities.[6] By early detection of these abnormalities, we can recognise the deteriorating patient in a timely manner and prioritise clinical response to improve patient outcomes. Measuring and documenting the patient's vital signs is crucial, even in a busy primary care environment. It provides essential, objective information. Vital signs should be interpreted in context, considering baseline values for the patient, and used as an adjunct to decision making not as a replacement for clinical judgement. Vital sign measurement can be challenging, it has been demonstrated that most physiological vital signs were not recorded consistently by primary care teams.[41, 42]

The six recommended vital signs for detection of sepsis are:

1. **Respiratory Rate (RR)**
2. **Oxygen saturations (SpO2)**
3. **Heart Rate (HR)**
4. **Systolic Blood Pressure (SBP)**
5. **Temperature**
6. **Level of consciousness**

***Respiratory rate*:** The evidence suggests that subtle changes in respiratory rate can indicate early signs of serious clinical deterioration.[43] This vital sign is most accurately measured over one minute and is often neglected.[44]

***Oxygen saturation**:* Clinicians should be aware that inaccurate SpO2 measurement can occur due to a number of causes, including poor perfusion and skin pigmentation,[45, 46] a full list of the possible causes can be accessed *here*. It is important to understand the limitations of pulse oximetry,[47] readings should be interpreted within the context of the patient, their history, baseline status and examination findings.

***Heart rate**:* Consider manual palpation or take the reading from your pulse oximeter or sphygmomanometer. Baseline heart rate may be lower in young people and adults who are fit; older people may develop a new arrhythmia in response to infection rather than an increased heart rate.[33] Heart rate response may be affected by common medicines such as beta-blockers and several anti-arrhythmic drugs.

Systolic blood pressure: Hypotension is important in the context of assessing acute-illness severity and can signify circulatory compromise due to sepsis. Interpret blood pressure in the context of baseline blood pressure.

***Temperature**:* Can be elevated, normal or low in people with sepsis. Temperature can also be raised as a response to trauma or surgery.[33, 48]

***Level of consciousness*:** Sepsis can present with an acutely altered mental status. The patient may have new-onset or worsening confusion, disorientation and/or agitation – this may be subtle and so family/carer input is important here. Consider asking "Do you feel that [patient's name] has been more confused recently? This simple question can contribute significantly to detection of altered mental status.[49]

The Alert, Confusion, Verbal, Pain, Unresponsive (ACVPU) scale[50] where 'C' represents 'new confusion/delirium or altered mental status' is a useful tool in assessing mental status.[51–53] Any score other than an A on the ACVPU scale warrants consideration of prompt medical intervention, as per *section 4.1*.[33, 52, 53]

3.0 RISK STRATIFICATION

Risk stratification can help determine the severity of illness, the need and urgency of referral and prioritisation of patients.[54] Physiological assessments using vital sign measurements can be used in isolation or as Early Warning Scores (EWS) to stratify patient risk, inform decision making and improve communication at the interfaces of care. They serve as an adjunct to decision making and ***do not*** replace clinical judgement. There is currently no gold standard for sepsis detection in primary care.

This document provides information on EWS's for sepsis but does **not** currently endorse their use. In general practice the use of an EWS in the assessment of patients with potential sepsis merits further research.

3.1 Vital signs for risk stratification

Sepsis risk stratification is a complex process. In the absence of a validated early warning score in primary care, single extreme vital sign systems offer an alternative solution. They can alert clinicians to the need for more detailed observation and investigation in secondary care. Clinical judgement remains paramount and vital signs should be interpreted in the context of what is normal for the patient, accurate history taking and examination and the primary care setting.

Although used in sepsis detection, single extreme vital sign scoring systems for defining sepsis have not been shown to be predictive of outcomes with suspected sepsis.[55] It is unusual for a single extreme physiological abnormality to occur in isolation as a precursor of significant deterioration: rather a combination of several often-minor abnormalities are more common and more predictive.[54]

3.2 Criteria for stratification of risk of severe illness or death from sepsis

Recent UK guidance[33] uses single vital sign measurements in addition to history and examination findings to aid decision making in the detection, assessment, and early management of suspected sepsis. Patients are stratified into high, moderate-high, and low risk categories on the basis of pre-defined criteria – see *Table 2*. Recommendations on escalation of care are made according to risk category.

Consider patients with any ***high-risk criteria*** to be at high risk of severe illness or death from sepsis.[33] If the patient meets any high-risk criteria, consider referral for emergency medical care[33] as per *section 4.1*.

Consider patients with any ***moderate to high-risk criteria*** to be at moderate to high risk of severe illness or death from sepsis.[33] If the patient meets any moderate to high-risk criteria use clinical judgement to decide whether the patient can be safely managed in the community. *"If a definitive diagnosis cannot be made, or the person's condition cannot be safely treated outside a hospital setting refer urgently for emergency care."*[33]

If the patient does not meet any high or high to moderate risk criteria, consider them as being at ***low risk*** of sepsis[33] and manage as per *section 4.2*.

Table 2: *Criteria for stratification of risk of severe illness or death from sepsis*[33]

CATEGORY	HIGH RISK CRITERIA	MODERATE TO HIGH RISK CRITERIA
History	• Objective evidence of new altered mental state	• History from patient, friend or relative of new onset of altered behaviour or mental state • History of acute deterioration of functional ability • Immunosuppressed • Trauma, surgery or invasive procedures in the last 6 weeks
Respiratory	• Raised respiratory rate: 25 breaths per minute or more • New need for oxygen to maintain saturations >92% (or more than 88% in known chronic obstructive pulmonary disease)	• Raised respiratory rate: 21 to 24 breaths per minute
Blood Pressure	• Systolic blood pressure 90 mmHg or less or • Systolic blood pressure more than 40 mmHg below normal	• Systolic blood pressure 91 to 100 mmHg
Circulation and hydration	• Raised heart rate: more than 130 beats per minute • Not passed urine in previous 18 hours • For catheterised patients, passed less than 0.5 ml/kg of urine per hour	• Raised heart rate: 91 to 130 beats per minute or new-onset arrythmia • Not passed urine in the past 12 to 18 hours • For catheterised patients, passed 0.5 ml/kg to 1 ml/kg of urine per hour
Temperature		• Tympanic temperature <36°C
Skin	• Mottled or ashen appearance, Cyanosis of skin, lips or tongue • Non blanching petechial or purpuric rash	• Signs of potential infection including redness, swelling or discharge at surgical site or breakdown of wound

Table retrieved from NICE Guideline [NG51]: Suspected sepsis: recognition, diagnosis and early management. London: National Institute of Clinical Excellence; 2016. Available *here* [permission sought]

3.3 Early Warning Scores (EWS)

Early warning scores have not been validated for use in primary care. There is however a growing evidence base to support their use in the prehospital setting. [54, 56–59]

The Irish National Early Warning System (INEWS) is in use in secondary care in Ireland since 2013 and is applicable to non-pregnant adult inpatients (>16 years), the INEWS scoring key can be found in *Appendix 2*. The National Early Warning System 2 (NEWS2) is in use in secondary care in the United Kingdom (UK) for non-pregnant adults >16 years. It is being implemented in community/pre hospital settings in the UK, such as ambulance trusts,[54] acute mental health settings and care homes.[60, 61] The NEWS2 scoring key and an algorithm for managing suspected sepsis outside an acute hospital setting can be found in *Appendix 3*.

EWS are evidence-based[62] and use the six physiological parameters: respiratory rate, oxygen saturations, heart rate, systolic blood pressure, temperature and level of consciousness. EWS are designed to aid clinical decision making and outline normal and abnormal ranges for each of the observations. A numerical score of between '0' and '3' is allocated to each of the six parameters. A score of '0' represents the least risk and a score of '3' represents the highest risk. The values for each of the six observations are added giving the patient's EWS. Clinical risk thresholds and associated responses have been attached to different scores with a graded response to escalation based on the EWS.

Trends in the patient's EWS/vital signs can be tracked between health interfaces e.g. GP – ambulance service – acute hospital. This can provide early warning of potential clinical deterioration, aid clinical prioritisation of patients, and provide a trigger for escalation of clinical care.[52, 58] This has the potential to improve GP to GP communication when patients re-present to a different GP or attend different services for further assessment, enabling deterioration to be identified objectively in addition to clinical judgement.[40]

This document does not currently endorse the use of an EWS in primary care rather it serves as a starting point for the development of a comprehensive Early Warning System for use in primary and community care.

4.0 MANAGEMENT OF SEPSIS IN PRIMARY CARE

Sepsis is a complex, multisystem disease and requires diagnosis and treatment in hospital coordinated by a secondary care team with expertise in managing patients with sepsis. When managing end-of-life-care in primary care, consider patient values and preferences in your clinical decision making.[55] The rationale for the decision not to escalate care should be clearly documented.

4.1 If "suspected sepsis"

"Do Not Delay" – If sepsis is suspected the patient must be transferred URGENTLY to an acute hospital.

- **Transfer** – transfer all patients to hospital immediately by the quickest route possible, use local judgement around carer and private transport versus ambulance transfer.
- **State** – clearly say "suspected sepsis" to the ambulance service and offer the findings of your assessment e.g. vital sign measurements, likely source of infection.
- **Document** – clearly document "suspected sepsis" on referral letters to secondary care including vital sign measurements, likely source of infection.
- **Alert** – pre-alerting before arrival in the emergency department (ED) has been found to almost halve the time of in-hospital treatment for patients.[63] Consider phoning the hospital ED to notify a senior clinician that you are referring a high-risk patient with suspected sepsis.

4.2 Safety-netting: If no current suspicion of sepsis

Provide patients with safety-netting advice where there is no current suspicion of sepsis.

Safety netting is a vital part of a sepsis aware consultation.

It is recommended that safety netting should be both verbal and written, and documented in the patient record.[64] Sepsis patient information leaflets, available *here* should be readily available for use. It is acknowledged that time constraints and clinical workload are significant challenges in general practice and therefore safety netting is essential.[30]

4.3 Pre-Hospital treatment of suspected sepsis

- Oxygen: Consider oxygen supplementation if SpO2 <92%. Aim for oxygen saturations of 94–98%, if at risk of hypercapnic respiratory failure (for example COPD patients) use target range of 88–92%.[65–67] Oxygen therapy can be delivered via nasal cannula at 2–6 L/min (preferably) or simple face mask at 5–10 L/min. For patients not at risk of hypercapnic respiratory failure who have saturation below 85%, treatment should be started with a non-re-breather reservoir mask at 15 L/min.[67]
- Pre-hospital Antibiotics: these are not currently recommended due to a lack of relevant evidence in the prehospital setting. The priority is urgent transfer for acute hospital evaluation and management.
- Meningococcal disease: if suspected (fever and purpuric rash), give appropriate doses of parenteral benzyl penicillin.[33] See *here* for management of suspected meningococcal disease.

4.4 Antimicrobial stewardship

Judicious antimicrobial prescribing is a key part of sepsis management.

Continued alignment of the national sepsis programme with national antimicrobial stewardship and antimicrobial resistance prevention programmes is a key recommendation of the National Sepsis report.[11, 21] Treatment of sepsis can be complicated by the presence of multi-drug resistant organisms.

The principles of antimicrobial stewardship can help protect antimicrobial treatment options. The "green/red" list of antibiotics has been developed which assists community prescribers in choosing an antibiotic, see *www.antibioticprescribing.ie*. "Green list" antibiotics are effective, have fewer side effects and are less likely to lead to resistant infections.[68]

5.0 SEPSIS PREVENTION

The most effective way to reduce sepsis morbidity and mortality is by prevention.

5.1 Vaccination

Promoting the uptake of vaccinations to reduce the risk of infection and sepsis is recommended. Guidelines for vaccination of the immunocompromised patient are outlined in the "*Immunisation Guidelines for Ireland*".[69] Immunocompromised groups for special consideration include those with: HIV infection, haematologic malignancies, acquired asplenia and hyposplenia, those treated with immunosuppressive drugs or radiation, chronic kidney disease, dialysis, and renal/liver transplant patients. Optimising vaccination of family members and household contacts to provide indirect protection for those for whom vaccination either does not provide adequate protection or is inappropriate is also a key recommendation of this guideline. Pneumococcal vaccination,[70] Covid-19 vaccination[71] and the annual Influenza vaccine[72] should be promoted where indicated.

5.2 Infection control

Healthcare associated infections, which are infections acquired during healthcare delivery, are common and are a risk factor for developing sepsis. While data is not available for general practice, one in four cases of sepsis in hospitals and one in two cases of sepsis in the Intensive Care Unit (ICU) result from healthcare-associated infections.[15] Infection control measures[73] including hand hygiene[74] by both healthcare professionals and the public is recommended and plays a key role in preventing infection and sepsis. See infection control guidance for general practice *here*.[75]

Any break in skin integrity such as a cut, abrasion, burn or a scrape can provide an entry point for microbes to enter the body. Aim to ensure and promote that all wounds be cleaned in a timely fashion, are kept clean as they heal and are monitored for signs of an infection.

5.3 Public awareness

All clinicians, including general practitioners have a key role in sepsis education.

Increasing public awareness of sepsis, risk factors, signs and symptoms are critical to save lives from sepsis. To give patients the best opportunity to survive they need to present for medical review and have sepsis recognised and managed in an appropriate and timely manner. GPs and their teams are ideally placed to educate patients and their families about the early symptoms of sepsis.

Public awareness of sepsis is generally low but varies globally.[76] Irish data would suggest that there is moderate public awareness about sepsis but that an understanding of the true impact and associated morbidity and mortality of sepsis is lacking.[77] Displaying a poster (see *here*) about the symptoms of sepsis in the surgery is an excellent way to promote a sepsis aware environment.

6.0 DOCUMENTATION AND CODING

Consider improving coding practices for sepsis in general practice. ICD-10-AM diagnosis codes for sepsis and septic shock are A41 (or A41.9) and R57.2 respectively. However, sepsis coding in general practice relies on an accurate discharge summary. Documentation of sepsis diagnosis on GP discharge letters from secondary care is a key recommendation on the recent HSE patient safety statement.[78]

7.0 POST SEPSIS SYNDROME

Sepsis survivors have an increased risk of hospital readmission and further sepsis episodes, especially in the first-year post discharge.[79] Sepsis survivors may continue to experience debilitating functional, psychological, cognitive, and physical symptoms beyond hospital discharge[80] – post-sepsis syndrome (PSS). These symptoms can include life-long physical disabilities such as limb amputation, increased cardiovascular risk, reduced respiratory capacity and neuromuscular dysfunction,[80] reduced mental or cognitive capacities[8] and mental health difficulties such as anxiety, depression and post-traumatic stress disorder (PTSD).[9, 81]

There is a need to increase awareness among primary and secondary healthcare teams of the impairments and risks incurred by sepsis survivors. Sepsis stands in contrast to cancer and stroke survivorship, where the ongoing challenges facing people are well documented.[82–84] The term "post sepsis syndrome" does not currently appear in the national clinical guideline.[21] Opportunities exist for education and research to address knowledge gaps and improve post-hospital sepsis multi-disciplinary care.

8.0 TOP TIPS AND PITFALLS

- Prevention: The most effective way to reduce morbidity and mortality from sepsis is by prevention e.g. vaccination.
- Think **"could this be sepsis"** if a person presents non-specifically unwell or with symptoms or signs that indicate possible infection, even if their temperature is normal.
- Recognise 'high risk groups'– treat patients with risk factors for sepsis with a high index of suspicion.
- Patient deterioration on antibiotic therapy and repeat visits for the same illness should heighten suspicion of sepsis.
- Symptoms of suspected sepsis can be subtle and misleading, mimicking and/or found in the presence of common conditions such as Influenza, this complicates timely sepsis detection.
- Pay particular attention to concerns expressed by the person, family, or carers: determine what is normal for the patient and what may have changed.
- Consider a "rule out" rather than a "rule in" approach regarding infection and sepsis. e.g. in the same way that the priority in chest pain is to rule out a cardiac cause, for infection the priority should be to rule out sepsis.
- Vital signs are vital – measure and document all SIX – Heart Rate/ Respiratory Rate/Oxygen saturations/Temperature/Blood pressure/Level of consciousness.
- Sepsis is a medical emergency – **"do not delay"** and refer urgently if suspected.
- Communicate explicitly and clearly with the national ambulance service and secondary care:

- **State** – clearly say "suspected sepsis" to the ambulance service and offer the findings of your patient assessment e.g. vital sign measurements, likely source of infection.
- **Document** – clearly document "suspected sepsis" on referral letters to secondary care including vital sign measurements, likely source of infection.
- **Alert** – consider a pre-alert to the acute hospital when referring patients with suspected sepsis.

- Consider patient values and preferences in your clinical decision making especially in end-of-life care. The rationale for the decision not to escalate care should be carefully considered and documented.
- If sepsis is not currently suspected- safety netting is essential – ideally written and verbal. Sepsis patient information leaflets, available *here* should be readily available for use.

9.0 FUTURE DIRECTIONS

An Irish national early warning score that is adapted and fit for purpose in all healthcare settings including primary care has the potential to improve patient outcomes by facilitating early detection of the deteriorating patient, prioritisation of care and improving communication between the interfaces of care. Research is urgently needed to assess the benefits of an EWS in primary care to ensure it confers significant clinical benefit and does not cause harm. It should be considered as a priority to encourage a body of work to validate an EWS in primary care and progression requires input from all affected stakeholders including general practice, the national ambulance service and secondary care.

Research is also required to assess the benefit of prehospital antibiotic administration for high-risk sepsis patients in the community. Prehospital administration of antibiotics for high risk sepsis patients is recommended under very specific circumstances in some guidance.[33, 66] Consultation between the National Clinical Programme for Sepsis, the Irish College of GPs, the National Ambulance Service and the Antimicrobial Resistance and Infection Control (AMRIC) team is essential prior to recommending prehospital antibiotics as part of a sepsis escalation pathway in Irish general practice.

APPENDICES

Appendix 1: Useful resources

Sepsis Patient information leaflet

HSE National Sepsis Report 2022

National Institute for Health and Care Excellence (NICE) guideline – Suspected sepsis: recognition, diagnosis and early management, 2016, updated 2024

Immunisation guidelines for Ireland, Chapter 3: Immunisation of immunocompromised persons

HSE Antibiotic Prescribing guidelines for community infections

PHECC Clinical Practice Guidelines, 2021

Royal College of General Practitioners (RCGP) Sepsis Guidance for GPs

Irish National Early Warning System (INEWS)

National Early Warning Score (NEWS) 2

NEWS2 Score Calculator

Appendix 2: Irish National Early Warning System (INEWS)[53]

The Irish National Early Warning System (INEWS) is in use in secondary care in Ireland, the INEWS scoring key can be found below. It applies to all adult non-pregnant inpatients (≥16 years) and is ***not*** currently validated, adapted, or widely used in Primary care.

Summary points which may be useful to primary care include:

1. EWS support but do not replace your clinical judgment: Urgent response is warranted if HR ≤40 or if clinical concern regardless of the INEWS score.
2. INEWS 4–6 THINK SEPSIS.
3. INEWS ≥7 transfer urgently to an acute care setting.

IRISH NATIONAL EARLY WARNING SYSTEM (INEWS) SCORING KEY							
SCORE	**3**	**2**	**1**	**0**	**1**	**2**	**3**
Respiration rate (bpm)	≤8		9-11	12-20		21-24	≥25
SpO2 (%)	≤91	92-93	94-95	≥96			
Inspired O_2 (Fi O_2)				Air			Any O_2
Heart rate (bpm)		≤40	41-50	51-90	91-110	111-130	≥131
Systolic BP (mmHg)	≤90	91-100	101-110	111-249	≥250		
ACVPU/ CNS response				Alert (A)			Confusion (new) (C), Voice (V), Pain (P), Unresponsive (U)
Temp (°C)	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

Deteriorating Patient Improvement Programme

RECOGNISE SEPSIS · ENHANCE SURVIVAL

Appendix 3: National Early Warning Score (NEWS) 2[52]

The National Early Warning Score (NEWS) 2 is in use in the United Kingdom (UK) for non-pregnant adults >16 years, it is ***not*** currently validated in primary care. The NEWS 2 scoring key and an algorithm for managing suspected sepsis can be found *here* under the heading 'NEWS in primary care'.

Summary points include:

- NEWS2 supports but does not replace your clinical judgment: Concern about a patient should lead to escalation regardless of the NEWS2 score.
- NEWS2 score ≥3 – **THREAT** – consider whether acute referral needed or can be safely managed at home.
- NEWS2 score ≥5 – **REFER** – consider obtaining an urgent medical review in an acute care setting.
- NEWS2 score ≥7 – **SEVERE** – deterioration is highly likely and consider EMERGENCY review in an acute care setting.
- a single parameter score of 3 is an indication that the patient may require management of their condition at a higher risk level than as suggested by their total NEWS2 score.

PHYSIOLOGICAL PARAMETER	SCORE						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO2 Scale 1(%)	≤91	92–93	94–95	≥96			
SpO2 Scale 2(%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

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CLINICAL AUDIT

Consider undertaking a clinical audit using this general practice update, see the Irish College of GPs audit resources *here.*

Clinical audits that could be carried out include:

Vaccination

Chronic Disease Management (CDM) programme: all registered patients should have the pneumococcal, COVID-19 and influenza vaccines – what proportion of patients have been offered/received the recommended vaccines?

Asplenic patients: how many have been vaccinated according to current national guidance? – see *here* for up to date guidance.

Paediatrics: Influenza vaccination was recommended for children aged 2 to 12 in the 2023/24 season. The aims are to both decrease the risk to the paediatric population and to decrease the amount of circulating influenza. What was the uptake for the paediatric flu vaccine in your practice for this cohort in the 23/24 season? Tips for increasing uptake for Children's Nasal Flu Vaccine can be found *here*.

Learning disabilities: People with a learning disability are more likely to die of sepsis. The HSE guidance recommends that Children with an intellectual disability are vaccinated against influenza, please see *here* for information. What proportion of children with learning disability in your practice are vaccinated against influenza? Learning disability is also associated with a high risk of severe COVID-19 disease. What proportion of adults/children with learning disability have been vaccinated against COVID-19 as recommended in your practice?

Documentation of six vital signs

Review the last ten adult patients >75y age presenting with signs and symptoms of infection/nonspecific illness. Were all 6 vital signs documented as part of the patient assessment?

Vital signs and Immunosuppression

In Immunosuppressed patients (due to drugs /disease) attending with an acute infection episode in the last 6 months, pick 20 patients – how many patients have all 6 vital signs documented.

The Irish College of GPs trains and supports general practitioners in Ireland throughout their career, from initial training to lifelong learning, research and advocacy.

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