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Improving sepsis recognition using the Sepsis Trusts’ community screening tool

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Abstract:	Sepsis is associated with high levels of morbidity and mortality. All healthcare professionals have a responsibility to ensure they have sufficient knowledge to effectively screen patients for signs and symptoms of sepsis. In the community setting, screening for sepsis can be challenging due to the complexity within the patient population and difficulties associated with observation for changes in the patient’s condition. The Sepsis Trust community nursing sepsis screening tool provides decision making support to community healthcare professionals enabling them to make a rapid assessment for risk factors for sepsis, ensuring a proportionate, consistent, and appropriate response. Through implementation of a decision support tool within the clinical setting it is likely that patients at risk of sepsis will be identified earlier, and patients will be escalated in a more consistent manner. This process of improving consistency in practice can improve patient outcomes, including mortality, morbidity, and overall patient experience.

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Title page

Improving sepsis recognition using the Sepsis Trusts' community screening tool

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Abstract:

Sepsis is associated with high levels of morbidity and mortality. All healthcare professionals have a responsibility to ensure they have sufficient knowledge to effectively screen patients for signs and symptoms of sepsis. In the community setting, screening for sepsis can be challenging due to the complexity within the patient population and difficulties associated with observation for changes in the patient's condition. The Sepsis Trust community nursing sepsis screening tool provides decision making support to community healthcare professionals enabling them to make a rapid assessment for risk factors for sepsis, ensuring a proportionate, consistent, and appropriate response. Through implementation of a decision support tool within the clinical setting it is likely that patients at risk of sepsis will be identified earlier, and patients will be escalated in a more consistent manner. This process of improving consistency in practice can improve patient outcomes, including mortality, morbidity, and overall patient experience.

Anonymous manuscript Click here to view linked References

Keywords:

Sepsis; Nursing; Risk Assessment; Infections; Community Nursing; Decision Making.

Key Points:

- Sepsis is associated with high levels of mortality and morbidity globally.
- Early recognition of sepsis is key to treatment and is associated with improved clinical outcomes.
- Identification of sepsis in the community setting can be challenging due to complexities in the patient population.
- Healthcare professionals in the community setting need to have a foundation knowledge of the red and amber flags for sepsis to facilitate identification.
- The Sepsis Trust recommends that healthcare professionals in the community setting use a sepsis screening tool to aid decision making around sepsis identification and management.
- Embedding a sepsis screening tool into daily practice can improve the consistency in the sepsis identification process which may be associated with improved patient outcomes.

Reflective Activities:

- Initially, consider what specific learning needs you might have in relation to understanding the pathway of developing sepsis and septic shock.
- From your experience, what factors increase the patient's risk of developing sepsis in the community setting?
- Consider whether there have been unwell patients in your own practice who may have had sepsis, what signs and symptoms did these patients have?
- How would using a sepsis screening tool change the way you might manage a patient with signs and symptoms of sepsis?
- Think about using the Sepsis Trust screening tool, what are some of the challenges to implementing this and embedding it in your daily clinical practice?

Improving sepsis recognition using the Sepsis Trusts' community screening tool

Introduction:

Sepsis remains a significant cause of morbidity and mortality across all high-, middle- and low-income countries despite increasing education for healthcare professionals and growing awareness from the public (Dondorp et al., 2019, Hantrakun et al., 2018, Jabaley et al., 2018, Rudd et al., 2020). Sepsis is currently defined as a dysregulated host response to an infection which is mediated by the immune system causing in a physiological cascade resulting in organ dysfunction, multi-organ failure and potential death (Feist, 2019, Kim and Park, 2019, Singer et al., 2016). Septic shock is a term which describes a later stage in this physiological cascade whereby there is profound circulatory, cellular, and metabolic abnormality which is associated with increased subsequent mortality rates. Patients with sepsis often have acute and critical care needs and therefore require definite treatment and monitoring within the acute secondary care setting (Hunt, 2019, Lin, 2021, Singer et al., 2016).

In the UK, c. 250,000 people are diagnosed with sepsis yearly, resulting in around 52,000 deaths which are directly attributed to sepsis as a cause of death (Rudd et al., 2020). Of those who survive, it is estimated that c. 60,000 people have residual and often permanent sequela after discharge from acute care (Iwashyna et al., 2012, Iwashyna et al., 2010). It is estimated that c. £15.6 billion is spent on the diagnosis and treatment of this illness (Prescott and Angus, 2018).

In 2015, the National Confidential Enquiry into Patient Outcome and Deaths (NCEPOD) highlighted the need for earlier detection of signs of sepsis across the healthcare system as the single most effective way of improving patient outcomes and potentially avoidable sepsis related deaths in the UK (NCEPOD, 2015). Furthermore, there is a growing body of evidence stressing the association between early identification of sepsis in patients with an infective source in the acute setting and improvements in outcomes including mortality, intensive care requirement and hospital length of stay (Burdick et al., 2020, Husabø et al., 2021, Kim and Park, 2019, Torsvik et al., 2016). The NCEPOD report also identified that around 70% of sepsis cases originated in the community setting. In a healthcare model whereby increasing numbers of acutely unwell patients are manged within the community setting, there is a need for specific early detection skills amongst healthcare professionals working (NCEPOD, 2015). Despite this, there is a paucity of evidence surrounding current community nursing practices around the identification of sepsis. The Sepsis Trust's community nursing sepsis screening tool provides one method of identifying patients at risk of

developing sepsis (Nutbeam and Daniels, 2020). This article aims to demonstrate how the community nursing sepsis screening tool can be used by healthcare professionals to improve identification of signs and symptoms of sepsis and facilitate consistent decision-making processes around escalation of care needs.

The Sepsis Trust:

The Sepsis Trust is a UK based charity, created in 2012 in an effort to raise awareness of sepsis and the high levels of mortality associated with sepsis. The charity has an overriding long-term aim of stopping preventable deaths from sepsis and providing support to all affected by this disease. The organisation works to raise awareness of sepsis among members of the public and healthcare professionals by providing education, research, and support to support early diagnosis. The Trust also lobbies politicians to raise awareness and improve standards of care whist providing greater support for sepsis survivors. Since the Sepsis Trust's inception there has been a steady increase in sepsis awareness at both national and international levels highlighting the substantial work which needs to be done to improve the immediate survival and long-term outcomes of patients with sepsis. The Sepsis Trust plays an important role in sepsis education for both patients and clinicians alike and has a wide range of resources which would be useful for both patients and healthcare professionals. The trust website can be accessed at: https://sepsistrust.org/

Recognising sepsis in the community setting:

It is essential for all healthcare professionals to have an underpinning baseline knowledge of sepsis as this knowledge equips a clinician with the tools to recognise the signs of sepsis, which can at times be vague and non-specific. Unrecognised sepsis in the community is associated with high levels of mortality and morbidity and delayed identification of sepsis has been demonstrated to increase the acute and critical care needs of patients (Scott et al., 2018). The Sepsis Trust has published a community nursing sepsis recognition tool to aid healthcare professionals in the community in identifying potential sepsis and providing a pathway to escalating increasing care needs to ensure timely transfer of patients to hospital. **Figure 1** presents the Sepsis Trust Community nursing sepsis screening tool which can be used on any patient over 12 years old.

-Insert Fig. 1 here-

Figure 1: Sepsis Screening Tool Community Nursing (Nutbeam and Daniels, 2020) (Reproduced with prior permission from the Sepsis Trust)

SEPSIS SCREENING TOOL COMMUNITY NURSING

AGE 12+

01 START THIS CHART IF THE PATIENT LOOKS UNWELL OR HAS ABNORMAL PHYSIOLOGY

RISK FACTORS FOR SEPSIS INCLUDE:

- ☐ Age > 75
- ☐ Impaired immunity (e.g. diabetes, steroids, chemotherapy)
- ☐ Recent trauma / surgery / invasive procedure
- ☐ Indwelling lines / IVDU / broken skin

02 COULD THIS BE DUE TO AN INFECTION?

LIKELY SOURCE:

- ☐ Respiratory
- ☐ Brain
- ☐ Urine
- ☐ Surgical
- ☐ Skin / joint / wound
- ☐ Other
- ☐ Indwelling device

YES

NO → **SEPSIS UNLIKELY, CONSIDER OTHER DIAGNOSIS**

03 ANY RED FLAG PRESENT?

- ☐ Objective evidence of new or altered mental state
- ☐ Systolic BP ≤ 90 mmHg (or drop of >40 from normal)
- ☐ Heart rate ≥ 130 per minute
- ☐ Respiratory rate ≥ 25 per minute
- ☐ Needs O_2 to keep SpO_2 ≥ 92% (88% in COPD)
- ☐ Non-blanching rash / mottled / ashen / cyanotic
- ☐ Recent chemotherapy
- ☐ Not passed urine in 18 hours (<0.5ml/kg/hr if catheterised)

YES → **RED FLAG SEPSIS START BUNDLE**

NO

04 ANY AMBER FLAG PRESENT?

IF UNDER 17 & IMMUNITY IMPAIRED TREAT AS RED FLAG SEPSIS

- ☐ Relatives concerned about mental status
- ☐ Acute deterioration in functional ability
- ☐ Immunosuppressed
- ☐ Trauma / surgery / procedure in last 8 weeks
- ☐ Respiratory rate 21-24
- ☐ Systolic BP 91-100 mmHg
- ☐ Heart rate 91-130 or new dysrhythmia
- ☐ Temperature <36°C
- ☐ Clinical signs of wound infection

YES →

1. **SAME DAY ASSESSMENT BY GP/ TEAM LEADER**
2. **IS URGENT REFERRAL TO HOSPITAL REQUIRED?**
3. **AGREE AND DOCUMENT ONGOING MANAGEMENT PLAN (INCLUDING OBSERVATION FREQUENCY AND PLANNED SECOND REVIEW)**

NO AMBER FLAGS = ROUTINE CARE / CONSIDER OTHER DIAGNOSIS

COMMUNITY NURSING RED FLAG BUNDLE:

THIS IS TIME-CRITICAL – IMMEDIATE ACTION REQUIRED:

DIAL 999 AND ARRANGE BLUE LIGHT TRANSFER

COMMUNICATION: Ensure communication of 'Red Flag Sepsis' to crew. Advise crew to pre-alert as 'Red Flag Sepsis'. Where possible a written handover is recommended including observations and antibiotic allergies.

UKST 2020 CM1.3 PAGE 1 OF 1

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To effectively identify sepsis, healthcare professionals should have assessment skills which enable them to take an accurate and focused patient history and physical assessment. Community clinicians are unable to easily access investigations and so need to rely on clinical judgement to elicit clinical signs which may help in the identification of the symptoms of sepsis (Olander et al., 2021). All patients should have a full set of vital signs completed and documented as part of the assessment process and a NEWS2 score should be calculated and documented for all vital signs recorded (Baker et al., 2021, Inada-Kim et al., 2020). The NEWS2 score is a simple risk stratification score which measures the potential for deterioration and critical illness and is calculated from the culmination of scores associated with each vital sign (Respiratory Rate, Oxygen Saturations, Pulse, Blood Pressure, Temperature and Level of Consciousness). The NEWS2 score itself is strongly associated with in-hospital mortality and there is growing evidence to support the use of NEWS2 in the community setting (Brangan et al., 2018, Pullyblank et al., 2020). It is important for clinicians to recognise that the use of NEWS2 in isolation is not sufficient for the identification of patients with sepsis and where possible this risk stratification score should be used alongside a sepsis screening tool in the clinical setting.

It is recommended that all clinical areas employ a sepsis screening tool to facilitate earlier identification of sepsis risk (Mulders et al., 2021). The tool is simple to follow and encourages the clinician to ask four questions to help elicit pertinent information from a patient history and physical assessment. The specific questions are as follows:

1. Does the patient look unwell, or do they have abnormal physiological signs?
2. Could this be due to an infection?
3. Are any Sepsis Red Flags present in this patient?
4. Are any Sepsis Amber flags present in this patient?

(Nutbeam and Daniels, 2020)

For patients who appear to be unwell or have abnormal physiological signs on examination, it is vital that clinicians are aware of factors which are recognised to increase the patient's risk of developing sepsis in the presence of an underlying infection. The patients at greatest risk of developing sepsis are as follows (Hunt, 2019):

- Older adults aged over 75 years
- Infants and young children
- People with learning disabilities

- Recent trauma, surgery, pregnancy, childbirth, or miscarriage
- Patients with an acute or chronic wound or skin breach
- Patients with an indwelling line or catheter
- Illicit intravenous drug use
- Patients with compromised immunity (post splenectomy, diabetes, long-term steroid or immunotherapy medications, or cancer and cancer treatment)

But what does sepsis look like?

Sepsis can present in many different ways, and the presentation of sepsis depends on specific characteristics of the patient including their co-morbidities and effects of the medications they are taking (Vincent, 2016). Patients who present with sepsis may have one or more of the following clinical signs or symptoms (Hunt, 2019):

- Pyrexia
- Rigors
- Hypothermia
- Decreased urine outcome
- Sustained tachycardia (heart rate >90 per minute)
- Nausea and/or vomiting
- Diarrhoea
- Fatigue/Lethargy/weakness
- Abnormal skin discolouration
- Sweating and/or clammy
- Severe pain

Clinicians should be aware that some indicators of infection like the presence of a pyrexia is not a good indicator of infection or sepsis in isolation, particularly in patients who are immunocompromised (Hunt, 2019). A proportion of patients with sepsis will present with hypothermia rather than a pyrexia, and there is evidence to show that outcomes for patient with sepsis presenting with a low temperature have worse outcomes, particularly in relation to mortality (Rumbus et al., 2017, Wiewel et al., 2016). For this reason, any patient who is presenting with a new onset undifferentiated illness or has vital signs which are abnormally deviated from baseline, an assessment for sepsis is required. It is also important for any healthcare professional to carefully consider whether the patient meets one of the high-risk criteria and critically ask themselves whether there is a potential source of infection, and this remains a crucial step in the recognition process for sepsis (Kabi et al., 2020).

If after taking a comprehensive history and completing a full physical examination of the patient, sepsis is unlikely and a source for infection is not identified, it is essential for the clinician to consider an alternative diagnosis. This is likely to involve further examination and history taking and if a cause is not identified this should be escalated to a decision-making clinician who might be a General Practitioner, Advanced Clinical Practitioner or Team leader. Where an infective source is likely, the next stage of the sepsis assessment is to consider whether the patient has any Red or Amber Flag signs.

-Insert Table 1 here-

Management of a 'Red Flag' sepsis:

Red Flags in healthcare are potentially alarming warning symptoms, signs and near patient diagnostic tests which highlight possibly serious underlying disease processes to healthcare professionals (Schroeder et al., 2011). **Table 1** presents key 'Red Flags' for sepsis in adults. To assess for the presence of Red Flags a face-to-face physical assessment is required including a full set of patient vital signs. The presence of one or more sepsis red flags indicates a time critical medical emergency and healthcare professionals in the community setting should implement the community nursing red flag care bundle without delay as the patient is likely to have sepsis or septic shock (Kopczynska et al., 2018). The primary action within this care bundle is to activate a response from the local emergency ambulance service (i.e., by calling 999 in the UK) (Nutbeam and Daniels, 2020). Within this process, the importance of effective communication and information transfer between healthcare professionals to key to preventing delays and enabling optimised treatment outcomes for the patient. Healthcare professionals should make sure that the correct terminology is used when communicating with both control room call handers and clinicians from the emergency services. It is important that community nurses state, where appropriate, that it is 'a red flag sepsis' to ensure that the emergency call is categorised correctly to get the most appropriate response time (Floer et al., 2021).

-Insert Table 2 here-

The overall aim of the community nursing red flag care bundle is to enable a rapid patient transfer to the acute secondary care setting. Management of sepsis in the acute secondary care setting follows an evidence-based approach using the 'Sepsis Six' care bundle approach to patient management (Lin, 2021). **Table 2** presents any overview of the sepsis six components. Early treatment following this protocol has been shown to reduce levels of mortality, critical care requirement and length of stay and improve long term determinants of health-related quality of life (Nutbeam and Daniels, 2020).

It is commonly acknowledged that healthcare professionals in the community are unlikely to be able to complete all (or sometimes any) of the sepsis six care bundle which is why the priority in the community is to call for emergency help to facilitate treatment and transfer to secondary care (Lin, 2021). Despite this, it is recognised that in many areas of the UK, where the emergency ambulance trusts are under increasing pressure, there are increasing response times. In this situation, after the emergency call has been made, there may be opportunities for practitioners with extended skills, carrying appropriate equipment, who have an extended scope of practice to commence treatment (Bain and Moggach, 2019, Raleigh and Allan, 2017). This is likely to be limited to oxygen therapy, intravenous fluid therapy and intravenous antibiotic therapies but it is important to recognise that the commencement of any treatment is secondary to calling for support from the emergency services.

Assessing for Amber Flags for Sepsis:

Where a patient has a clear infective source but does not have any sepsis Red Flags, the clinician is required to move onto stage 4 of the community nursing sepsis screening tool which focuses on the identification of the Amber Flags for sepsis (Nutbeam and Daniels, 2020). Amber Flags in sepsis are less specific and indicate potentially sub-acute than the red flag signs but highlight that a patient could deteriorate and develop red flag signs if urgent care and treatment is not provided (Allen, 2018). If you are assessing for amber flags in a patient between 12-17 years old and the patient is immunocompromised then they should be treated immediately as a Red Flag sepsis and the community red flag sepsis care bundle should be commenced immediately (Nutbeam and Daniels, 2020). The amber flag signs are presented in **Table 1** and if one or more sign is present during assessment then a pre-defined escalation plan is included with the Community nursing sepsis screening tool. The healthcare professional must select the most appropriate escalation option based on the findings of the physical assessment process and in agreement with the patient or their primary carer. Escalation will follow one of the following processes:

- Is the patient well enough to have a same day review by a decision-making clinician (e.g., GP)?
- Is an urgent referral for review by the acute secondary care team required? (e.g., transfer to the emergency department for the acute medical team to review the patients care needs)
- Does the patient meet the essential criteria for review by the Hospital in the Home team?

If there is any doubt as to whether the patient can wait for assessment and treatment, then call the emergency services as they will provide a decision-making clinician who is trained to decide whether the patient requires immediate transfer to acute secondary care. Where possible, it is important to integrate the patient and/or primary carer in the process of making decisions relating to treatment including transfer to hospital (Abrashkin et al., 2019). If a patient is refusing transfer to hospital, it is essential for the healthcare professional to make a formal assessment of mental capacity of the patient recognising that sepsis could potentially impact on a patient's capacity and ability to make decisions whilst potentially critically unwell (Marshall and Sprung, 2016).

Where no amber flags are identified the assessing clinician can be confident that there are no current signs of sepsis even when an underpinning source of infection has been identified. In this instance, it is important that the clinician can undertake further investigation through physical assessment with history taking and potentially the use of secondary data (i.e., blood tests) to identify a diagnosis for the patient. In the presence of an infection, this is likely to result in commencing antibiotic treatment (if not already started). Where commencing treatment is not within the scope of practice of a community healthcare professional, then timely escalation to a decision-making clinician is required at this point. It is important for any community healthcare professional using the sepsis screening tool to recognise that assessment for signs of sepsis needs to occur longitudinally at different time points because although the patient does not have any red flag signs during the initial assessment, it does not mean that they will not deteriorate and develop red flag signs in the future. As there are likely to be extended periods of time when patients are not under observation for deterioration (i.e., in between visits from a healthcare professional) effective safety netting and patient education is key to protecting both patients and clinicians alike (Massey et al., 2017, Tucker and Lusher, 2018).

Safety Netting advice in those at risk of developing sepsis:

The sepsis screening tool enables community healthcare professionals with a method of supporting the decision-making process in identifying sepsis and those patients who are likely to require escalation and urgent treatment in both primary and secondary care setting (Edwards et al., 2019). For any patient who is not transferred to a definitive care setting at the time of initial screening, it is

important to consider what education and support these patients require at home. At a minimum, each patient will require both written and verbal safety netting (Edwards et al., 2021). The Sepsis Trust have produced several patient resources which can be useful to ensuring patients and carers have sufficient information to identify potential signs of deterioration. These resources can be accessed on the sepsis trust website: https://sepsistrust.org/get-support/support/resources/. In relation to effective case management, all safety netting advice should be documented within the patient's case notes, alongside any treatment which has been offered or commenced at the time assessment. It is important to patients that they understand when they will next be reviewed by a healthcare professional and advise on how to contact the emergency service if the patient or carer is concerned about deterioration (Edwards et al., 2021).

Conclusion:

As there is evidence showing that a substantial proportion of patients develop sepsis within the community setting there is a clear need for clinicians to have support in the decision-making process around sepsis identification. There is a continuing need for more research into clinical practices in the community to understand how the specific complexities of managing potentially acutely unwell patients within their own home environment affects education and learning needs for community healthcare professionals. The Sepsis Trust's community nursing sepsis screening tool provides an evidence informed approach to the identification and early recognition of patients with signs and symptoms of sepsis. Implementation of this screening tool is likely to improve the consistent approach to early identification of both red and amber flags in a patient with an underlying infective process. There is evidence to demonstrate the improved clinical outcomes and reduced mortality rates in patients with sepsis.

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Figure 1

Click here to download Figure (i.e. diagram, illustration, photo) Figure_1.jpg

SEPSIS SCREENING TOOL COMMUNITY NURSING — AGE 12+

01 START THIS CHART IF THE PATIENT LOOKS UNWELL OR HAS ABNORMAL PHYSIOLOGY

RISK FACTORS FOR SEPSIS INCLUDE:

- ☐ Age > 75
- ☐ Impaired immunity (e.g. diabetes, steroids, chemotherapy)
- ☐ Recent trauma / surgery / invasive procedure
- ☐ Indwelling lines / IVDU / broken skin

YES

02 COULD THIS BE DUE TO AN INFECTION?

LIKELY SOURCE:

- ☐ Respiratory
- ☐ Brain
- ☐ Urine
- ☐ Surgical
- ☐ Skin / joint / wound
- ☐ Other
- ☐ Indwelling device

NO → **SEPSIS UNLIKELY, CONSIDER OTHER DIAGNOSIS**

YES

03 ANY RED FLAG PRESENT?

- ☐ Objective evidence of new or altered mental state
- ☐ Systolic BP ≤ 90 mmHg (or drop of >40 from normal)
- ☐ Heart rate ≥ 130 per minute
- ☐ Respiratory rate ≥ 25 per minute
- ☐ Needs O_2 to keep SpO_2 ≥ 92% (88% in COPD)
- ☐ Non-blanching rash / mottled / ashen / cyanotic
- ☐ Recent chemotherapy
- ☐ Not passed urine in 18 hours (<0.5ml/kg/hr if catheterised)

YES → **RED FLAG SEPSIS START BUNDLE**

NO

04 ANY AMBER FLAG PRESENT?

IF UNDER 17 & IMMUNITY IMPAIRED TREAT AS RED FLAG SEPSIS

- ☐ Relatives concerned about mental status
- ☐ Acute deterioration in functional ability
- ☐ Immunosuppressed
- ☐ Trauma / surgery / procedure in last 8 weeks
- ☐ Respiratory rate 21-24
- ☐ Systolic BP 91-100 mmHg
- ☐ Heart rate 91-130 or new dysrhythmia
- ☐ Temperature <36°C
- ☐ Clinical signs of wound infection

YES →

1. SAME DAY ASSESSMENT BY GP/ TEAM LEADER
2. IS URGENT REFERRAL TO HOSPITAL REQUIRED?
3. AGREE AND DOCUMENT ONGOING MANAGEMENT PLAN (INCLUDING OBSERVATION FREQUENCY AND PLANNED SECOND REVIEW)

NO AMBER FLAGS = ROUTINE CARE / CONSIDER OTHER DIAGNOSIS

COMMUNITY NURSING RED FLAG BUNDLE:

THIS IS TIME-CRITICAL – IMMEDIATE ACTION REQUIRED:

DIAL 999 AND ARRANGE BLUE LIGHT TRANSFER

COMMUNICATION: Ensure communication of 'Red Flag Sepsis' to crew. Advise crew to pre-alert as 'Red Flag Sepsis'. Where possible a written handover is recommended including observations and antibiotic allergies.

UKST 2020 CM1.3 PAGE 1 OF 1

 Click here to download Table Table1_RedFlags.docx

Table 1: Red and Amber Flags for Sepsis

Red Flags for sepsis	Amber flags for sepsis
New confusion/altered mental state	Relatives are concerned about a change in mental status
Systolic blood pressure ≤90mmHg (or a drop of >40 mmHg from baseline blood pressure)	Systolic Blood Pressure 91-100mmHg
Heart Rate ≥130 per minute	Heart Rate 91-130 or new dysrhythmia
Respiratory Rate ≥ 25 per minute	Respiratory rate 21-24 per minute
Not passed urine in 18 hours (if catheterised <0.5ml/kg/hr)	Acute deterioration of functional ability
New oxygen demand [needs supplemental oxygen to keep SpO_2 ≥92% (or 88% in COPD)]	Immunosuppressed
Non-blanching rash/skin mottling/ ashen skin tone/ or cyanosis.	Trauma/Surgery/interventional procedure in the last 8 weeks
Recent chemotherapy	Temperature <36.0°C
	Clinical signs of an infected wound

 Click here to download Table Table2_SepsisSix.docx

Table 2: An overview of the sepsis six care bundle (Lin, 2021, Nutbeam and Daniels, 2020).

Sepsis-Six care bundle:	Clinical Reasoning:	Why is this important:
Commence oxygen therapy (high flow oxygen using a non-rebreathe-mask)	Aim to keep saturations >94% If COPD and at risk of CO_2 retention aim for oxygen saturations 88-92%)	In sepsis, oxygen supply and demand is not matched, causing a critical imbalance. Correcting low oxygen saturations can help to reduce tissue hypoxia
Take and send Blood Cultures	Think about potential source of the underlying infection – consider sending urine/sputum/wound samples for microscopy, culture, and sensitivity (MC&S). The patient should have a minimum septic screen including peripheral blood cultures, urine and a chest x-ray.	Tests help clinicians to understand the severity of the problem and stratify risk. This involves identifying the causative pathogen to enable effective treatments to be commenced.
Initiate intravenous antibiotics	Follow local anti-microbial guidelines. Consider allergies prior to administration.	Giving antibiotics helps to control the source of the infection which reduces the stimulus to the immune system
Initiate intravenous fluids	If hypotensive/lactate >2mmol/l or acute kidney injury (AKI) commence fluids up to 30ml/kg in 10ml/kg aliquots. Give 500mls stat if no AKI, not hypotensive and lactate normal.	Hypovolaemia contributes to shock in sepsis. Temporarily restoring fluid volumes can help correct until additional treatments can be established.
Measurement of lactate	If lactate >4mmol/l monitor after administration of each 10ml/kg fluid challenge. Lactate of >4mmol/l is indicative of early admission to intensive care. Re-measure any lactate in the presence of any sign of deterioration	Lactate is a product of anaerobic metabolism and therefore represents the extent of poor oxygen delivery to the cells in the patient.
Measurement of urine output	Hourly urine measurement is required, and catheterisation is required. Ensure that fluid balance chart is commenced and completed hourly.	Urine output provides an important measure of physiological status and often is an early indicator of deterioration. Aim for a urine output of 0.5 ml/kg/hour.

Reviewer Comments/Author Responses table:

Reviewer Comment:	Author Response:
Reviewer 1:	
This is a narrative review of the use of the Sepsis Trust Screening tool for the community diagnosis of sepsis. It should be remembered that whilst the Sepsis Trust tools are commonly advertised, they are not used throughout hospital practice. They are sensible but have not been validated. Nevertheless, the earlier that sepsis is treated with antibiotics, the better the outcome. This tool is also useful for recognising a sick patient.	Thank you for your review.
I find the narrative a little directionless at times and there is an excess of words; it would benefit from having aims and objectives, background, rationale and use.	Narrative and content reviewed prior to resubmission.
The paragraph on P4 : "Recognising sepsis in the community setting" is repeats some of what was said at the beginning	Narrative and content reviewed prior to resubmission.
Personally, I would put the paragraph on P8 "But what does sepsis look like?" earlier to put the screening tool in context. Some of the list that follows in this paragraph probably relate to septic shock too.	I have considered this but as the aim of the article is to walk readers through using the Sepsis Trusts community nursing sepsis recognition tool I have decided to keep the order suggested as this will hopefully be clear to the reader.
P3 "The NCEPOD report also identified that around 70% of sepsis cases originated in the community setting. In a healthcare model whereby increasing numbers of acutely unwell patients are manged within the community setting," Do we really need the word 'setting'? It is repeated a lot!	The word 'setting' has been removed in this sentence. By using setting, I was aiming to be clear about what I mean by the word community which at times would otherwise be ambiguous.
P7: NEWS2 are readers going to know what NEWS2 is? Does it need introducing	The following sentence has been added to address this and add clarity: "The NEWS2 score is a simple risk stratification score which measures the potential for deterioration and critical illness and is calculated from the culmination of scores associated with each vital sign (Respiratory Rate, Oxygen Saturations, Pulse, Blood Pressure, Temperature and Level of Consciousness)."
P7: "As there is limited access to secondary data in the community setting, clinicians need	This has been amended within the manuscript

to use the examination process to elicit clinical signs which may help in the identification of the symptoms of sepsis (Olander et al.,2021)." Do you just mean "Community clinicians are unable to easily access investigations and so need to rely on clinical judgement"?	
P12: "definitive care setting" why? why not say "hospital"?	This has been amended in the manuscript.
Reviewer 2:	
A very well written and comprehensive article. I was particularly pleased to see how much effort was put into the significance of clinical assessment along with the assessment tool. A few minor comments only, on page 11, a typographical error HitH should be changed to HatH	Thank you for your review. This abbreviation has been removed as it is not used elsewhere in the manuscript.
Table 1 also i believe is confusing in its format. It is meant to be an overview of three separate lists, the sepsis six, the red and the amber flag signs, but in the way it is created it is confusing and could create the impression that specific interventions of the sepsis six target specific red or amber flag signs. I believe it could benefit from some redesigning, or potentially separate the columns completely?	On refection I agree that this is confusing. I have revised the table and split it into two separate tables. The first, presents both the red and amber flags for sepsis and the second presents the Sepsis-Six care bundle. I have added additional columns to table 2 to provide further information about the clinical reasoning and why it is important.
Otherwise, a very informative and useful article, with useful and realistic information for healthcare professionals	Thank you.