Sepsis Management in non- pregnant adult patients- Full Clinical Guideline

Reference no.CG-T/2024/177

1.0 Introduction

The recorded incidence of sepsis is rising by approximately 11.5% each year in UK according to Hospital Episodes Statistics (HES) data. In the United Kingdom, there are more than 250,000 episodes of sepsis annually, with at least 44,000 patient deaths.
Improving recognition, early treatment and resuscitation has been shown to increase survival rates

2.0 Aims and purpose

The purpose of this guideline is to provide clear guidance for staff treating adult non-pregnant patients (older than16 years of age) with sepsis or suspected sepsis across the Trust and ensure standardised screening, treatment and follow up is delivered consistently in order to improve sepsis outcomes.

The guideline applies to all nursing and medical staff from University Hospitals of Derby and Burton NHS Foundation Trust treating non pregnant adults with the exception of patients deemed not for active therapy after consultant assessment.

Other sepsis guidelines exist and should be consulted according to area and speciality :

- Paediatric Sepsis Guidance
- Obstetric and Maternity Sepsis Guidance
- Early Onset Neonatal Sepsis Guideline
- Late Onset Neonatal Sepsis Guideline
- Sepsis Unknown Origin in Non-Pregnant Adults -Microbiology Guidance
- Neutropenic Sepsis Guideline

3.0 Key responsibilities and duties

3.1 -Trust Board The Trust Board has a legal responsibility for Trust policies and guidelines and for ensuring that they are carried out effectively.

3.2-Patient Safety Group (PSG) Patient Safety Group meets regularly in accordance with the terms of reference.

3.3-The Trust Deteriorating Patient Group reports to the Patient Safety Group. The group provides advice, support and escalation of information or concerns as necessary in relation to the reports.

3.4- Doctors and ACP : Must be aware of the trust guideline and the steps required for successful completion of sepsis screening tool and sepsis 6 pathway. All grades of doctors and ACPs to have attended 'Essential to role' training for sepsis and have awareness of latest antibiotics guidance.
Must act in the interest of good antibiotic stewardhip exercising good clinical judgement and responsible antimicrobials prescription using available resources to make an informed diagnostic and therapeutic decision

3.5-Matrons and Ward Sisters: are responsible for ensuring this guideline is disseminated to clinical staff in their areas of responsibility and ensure their staff have attended 'Essential to role' training for sepsis.

3.6-Individual staff: Adhere to and follow the trust guideline for sepsis management as required by their role and attend essential to role sepsis training.

4.0 Definitions , keywords

Sepsis Definitions:

Professional narrative definition of Sepsis:
'Sepsis is characterised by a life-threatening organ dysfunction due to a dysregulated host response to infection.'

Definition of septic shock: 'Sepsis-3'
'Septic shock is a subset of sepsis where particularly profound circulatory, cellular and metabolic abnormalities substantially increase mortality.'

Septic shock is persisting hypotension requiring vasopressors to maintain a mean arterial pressure (MAP) of 65 mmHg or more (BP systolic of 90 mmHg) and having a serum lactate level higher than 2 mmol/l despite adequate volume resuscitation.
Patients with septic shock can be clinically identified by a vasopressor requirement to maintain a mean arterial pressure of 65mmHg (BP systolic of 90 mmHg) or greater, with serum lactate level greater than 2 mmol/L (>18mg/dL) in the absence of hypovolemia. This combination is associated with hospital mortality rates greater than 40%.

5.0 Recognition and management of sepsis

We recommend that a patient be screened for sepsis when in the context of **presumed or confirmed infection**, the patient :

• LOOKS UNWELL TO A CLINICIAN OR CARER
• HAS HAD RECENT CHEMOTHERAPY OR IMUNOTHERAPY
• HAS A LACTATE 2mmol/L OR ABOVE
• HAS A NEWS 2 SCORE OF 5 OR ABOVE

5.1 Patient groups at high risk of sepsis

(adapted from NICE guideline [NG51], Sepsis: recognition, diagnosis and early management)

The very young (under one year) and older people (over 75 years) or people who are very frail

Patients with impaired immune systems because of illness or drugs, including:

- being treated for cancer with chemotherapy
- patients who have impaired immune function (diabetes,splenectomy, sickle cell disease)
- on long-term steroids
- on immunosuppressant drugs to treat non-malignant disorders such as rheumatoid arthritis
- following surgery, or other invasive procedures (in the last 6 weeks)
- with breach of skin integrity (cuts, burns, blisters or skin infections)
- patients who misuse drugs intravenously
- patients with indwelling lines or catheters

Women who are pregnant, have given birth or had a termination of pregnancy or miscarriage in the past 6 weeks are in a high-risk group for sepsis. In particular, women in this group who:

- have impaired immune systems because of illness or drugs
- have gestational diabetes or diabetes or other comorbidities
- have needed invasive procedures (for example, Caesarean section, forceps delivery, removal of retained products of conception)
- had a prolonged rupture of membranes
- have or have been in close contact with people with group A streptococcal infection, for example, scarlet fever
- have continued vaginal bleeding or an offensive vaginal discharge

5.2 When to suspect sepsis

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

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

- Assess people who might have sepsis with extra care if they cannot give a good history, for example people with English as a second language or people with communication difficulties (such as learning disabilities or autism). [NICE 2016, amended 2024]

- Suspect neutropenic sepsis in people who become unwell and:
  -are having or have had systemic anticancer treatment within the last 30 days
  -are receiving or have received immunosuppressant treatment for reasons unrelated to cancer. Use clinical judgement (based on the person's specific condition, medical history, or both, and on the treatment they received) to determine whether any past treatment may still be likely to cause neutropenia. [NICE 2016, amended 2024]

- Use a structured set of observations to assess people to stratify risk if sepsis is suspected.

5.3 Evaluating risk level

Grade **risk of severe illness or death from sepsis** using the person's:

- history
- physical examination results (especially symptoms and signs of infection – in line with recommendation on when to suspect sepsis outlined above in **Paragraph 5.1** and
- NEWS2score.

Use all this and a comprehensive risk assessment of the individual patient by a **doctor or equivalently trained health professional at FY2 or above** to determine if patient is at high risk of severe illness or death from sepsis.

Interpret the NEWS2 score within the context of the persons' underlying physiology and comorbidities

LOW RISK : **NEWS 2 score of 1-4**

MODERATE RISK : NEWS 2 score of 5 or 6

HIGH RISK : **NEWS 2 score of 7 or more**

Consider patients at **higher risk than suggested by NEWS 2 score** if their NEWS 2 <7 but patient has:

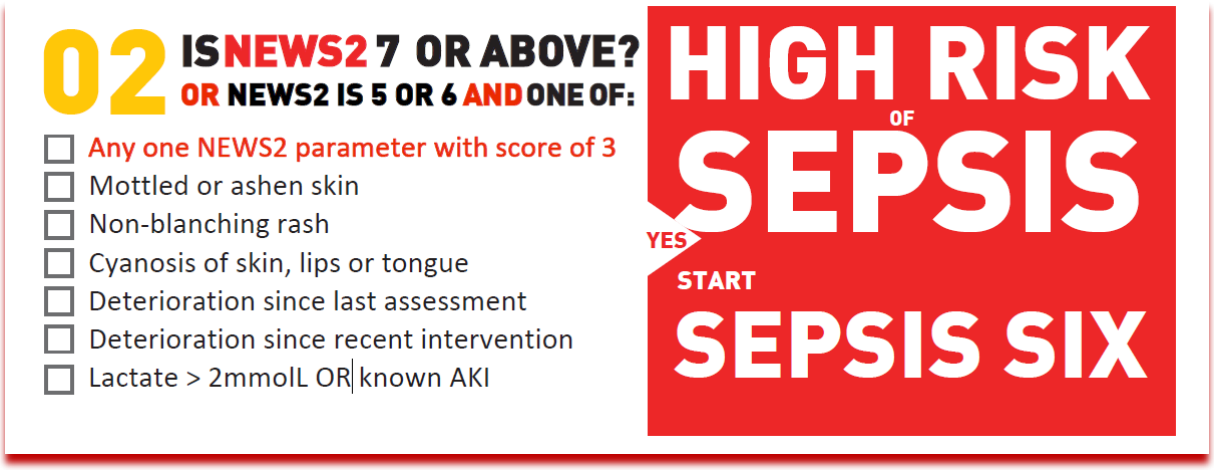
- mottled or ashen appearance
- non-blanching petechial or purpuric rash
- cyanosis of skin, lips or tongue
- deterioration since last NEWS measured (could be ambulance , other care setting,
- deterioration since last intervention
- lactate >2 or AKI
- if a single parameter contributes 3 points to the total NEWS2 score, request a high-priority review by a clinician (FY2 or above) for a definite decision on the person's level of risk of severe illness or death from sepsis. **[NICE 2024]**

NEWS2 score of 3 in a single parameter may suggest an increased risk of organ dysfunction and further deterioration which could lead to a decision on change of frequency of monitoring or escalation of clinical care.

'High Risk Sepsis' criteria **(Red Flags),** is not a formal 'diagnosis' of sepsis but a bedside tool which suggests it is highly likely that the patient is seriously ill with an infection and should empower health professionals to act immediately.

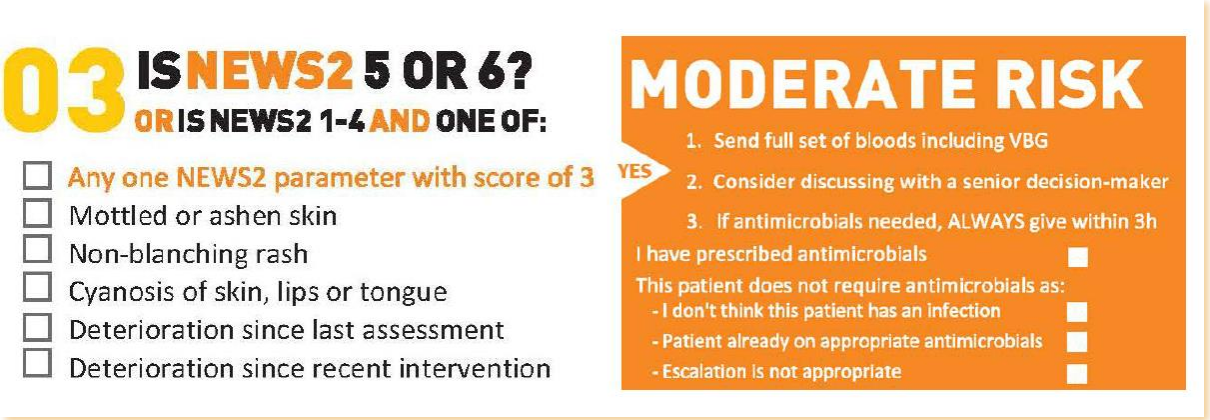
All patients who fit the **criteria for 'High Risk Sepsis' (Red Flags)** should have Sepsis Six Bundle in one hour, except cases when after senior doctor review, there is a documented decision that the patient does not have an infection **OR** the clinical deterioration is prompted by another medical condition.

If a single parameter contributes 3 points to the overall NEWS2 score, request a high-priority review by a clinician with core competencies in the care of acutely ill patients (FY2 or above), for a definite decision on the person's level of risk of severe illness or death from sepsis.



Remember ! Many conditions can mimic sepsis (trauma, cerebral haemorrhage, myocardial infarction etc) and a positive screening test is not necessarily a confirmation of diagnosis.

Moderate Risk Sepsis criteria **(Amber Flags)** indicates the need for urgent action (within 3 hours):



Decision-making, once one or more Amber Flags has been identified, is based upon clinical judgement and new information as it becomes available, and should take into account both patient and environmental factors.
Should a clinician decide urgent antimicrobials are unnecessary, they should consider alternative diagnoses and assess severity of illness in that context.

Vital signs	**Vital signs: NEWS-2 'Physiology first'**	0	1-4	5-6	≥7
Initial assessment	**History, examination, lab results**	***If clinical or carer concern, continuing deterioration, surgically remediable sepsis, neutropaenia, or blood gas / lab evidence of organ dysfunction, including elevated serum lactate, upgrade actions at least to next NEWS-2 level →***			
	Comorbid disease, frailty, patient preferences?	*Consider influence of comorbid disease, frailty and ethnicity on NEWS-2, and patient preferences for treatment intensity, limits, end-of-life care*			
Initial (generic) actions	**Monitoring and escalation plan**	Standard observations	• Registered nurse review <1 h • Obs 4-6 hrly if stable. • Escalate if no improvement	• Obs hourly. • Review <1 hr by clinician competent in acute illness assessment • Escalate if no improvement	• Obs every 30 mins. • Review <30 min by clinician competent in acute illness assessment. • Senior doctor review <1 hr if no improvement: refer to Outreach or ICU
	Initial treatment of precipitating condition	Standard care	<6 hr	<3 hr	<1 hr
Likelihood of infection & specific actions	Unlikely	Standard care	Review daily and reconsider infection if diagnosis remains uncertain		
	Possible	Review at least daily	**< 6 h** • Source identification & control plan documented.	**< 3 h:** • Microbiology tests • Antimicrobials: administer or revise • Source identification & control plan documented. **< 6h** • Source control initiated **48 – 72 h** • Review antimicrobials with ID/micro/senior clinician	**< 1 h:** • Microbiology tests • Antimicrobials: administer or revise (broad-spectrum if causative organism uncertain). **< 3 h** • Source identification **3-6 h** • Source control initiated according to clinical urgency **48 – 72 h:** • Review antimicrobials with ID/micro/senior clinician
	Probable or definite	**< 6 h** • Diagnostic tests & R plan	**< 6 h** • Microbiology tests • Antimicrobials: administer or revise • Source identification & control plan. • D/w ID/micro if uncertain, & review		

***Figure 1**: Clinical Decision Support Framework for initial evaluation and treatment in non-pregnant adult patients*

At any stage in the screening process, even for a patient with a low NEWS2 score, clinical judgment should 'trump' screening tools and health professionals should feel empowered to act if they have significant concerns about their patient.

Where available consider the use laboratory or POCT markers like **procalcitonin** to aid your diagnosis and therapeutic choice according to Trust guidance Serum Procalcitonin Assay (koha-ptfs.co.uk)

5.4 Initial Management

Includes an immediate assessment of ABCDE, a brief history and targeted examination followed by

SEPSIS SIX PATHWAY

The Sepsis 6 should be delivered as quickly as possible, but always within the first hour if the patient fits the High Risk criteria .

5.4.1 SENIOR REVIEW (ST3+ or equivalent senior ACP)

Preservation of antimicrobials is critical to mankind's future. A senior clinician can exercise judgment in determining appropriate initial antimicrobial therapy, and they can also make rapid decisions around appropriate tests and source control and ensure these are acted upon quickly. Experience can also help in evaluating for sepsis mimics such as pancreatitis, profound dehydration, cardiac problems.

5.4.2 GIVE O2 (to maintain SpO2 94% -98% in acutely ill patients with no signs of type 2 respiratory failure)

In sepsis, a critical imbalance exists between oxygen demand by the tissues and its supply. Oxygen delivery is compromised due to a combination of reduced blood pressure and possibly flow, tissue oedema and abnormal flow of blood through capillary beds. Demand of the cells for oxygen is increased as the hypermetabolic state means cells have increased oxygen requirement.

Remember! Oxygen is a drug and requires prescription by target saturation.
Patients with known COPD will need different target SpO2 according to their personal care plan.
In patients with known COPD, seek senior advice and have a low threshold for repeating arterial blood gas sampling. Once the SpO2 is at 98% titrate to target saturations prescribed for the patient.

5.4.3 SEND BLOODS INCLUDING CULTURES

Send bloods for FBC, U&E , clotting samples, CRP.

Blood cultures should be taken percutaneous, and from all intravenous access devices that have been in for more than 24 hours.Pay attention to the amount of blood and number of bottles required for a full microbiology work-up. Please refer to the updated Trust Blood Culture Policy.
Cultures should be taken before antibiotics are started unless this creates a considerable delay in antibiotic administration (e.g. purpura fulminans)

If the source of sepsis is suspected/known send other cultures too; for example sputum, urine, CSF, or any overt pus.

5.4.4.GIVE ANTIBIOTICS AND CONSIDER SOURCE CONTROL

Antibiotic choice should be guided by the suspected focus of infection. This depends on the clinical, microbiological and radiological evidence for infection. The choice of antibiotic should be in line with latest hospital guidelines. If in doubt, discuss with the microbiology or infectious diseases teams

In sepsis of unknown origin the dedicated guideline should be followed while all efforts are made to identify the source of infection.

Not all sepsis is caused by bacteria.
Certain risk factors should prompt consideration of **anti-fungal** treatment, including patients with:

- solid organ transplants,
- those who have received multiple or prolonged courses of antibiotics,
- those with complicated bowel perforation.

A failure to respond to therapy should alert the clinician to the possibility of an alternative diagnosis, the need to escalate spectrum of antibiotic cover, or to consider fungal, viral or atypical bacterial causes

Patients with possible or probable infection and NEWS2 score of 5-6 who do not have septic shock or a need for urgent source control- should receive antimicrobials within 3 hours.

For patients with NEWS 2 score of 1-4 and probable infection, antimicrobials (if indicated) should be administered within 6 hours, while those with possible infection should have diagnostic tests and a source control plan within 6 hours which **may** include prescribing antimicrobials.

These are maximum periods, not targets.

The aim is not to delay treatment, but to allow sufficient time to make an informed clinical judgement and antibiotic prescription.

If a source of infection is identified which is amenable to drainage or removal, then this should be planned once initial resuscitation has been completed and undertaken as soon as it is safe and practicable to do so.

Consider need of surgical intervention –drainage of pus-filled cavities (intra- abdominal collection, pseudo cysts, abscess, empyema) debridement of necrotic devitalised tissue , infected tissue or gross tissue contamination (open chronic wounds), removal of infected prosthesis or foreign body which can't be treated by antibiotics alone and must be treated surgically at the earliest opportunity
Remove peripheral or central lines if they are considered to be infected.

5.4.5. INTRAVENOUS FLUID RESUSCITATION

Aims of fluid resuscitation : To correct absolute or relative hypovolemia and bring the patient's pulse, blood pressure, mental state, lactate and urine output within usual baseline for that patient.

Fluid challenges should always be commenced within the first hour (with the first 500ml delivered within 15 minutes) in any patient with High Risk criteria for Sepsis.
Give intravenous fluid boluses with lower volumes in patients at risk of overload. Fluid of choice is crystalloid (Hartmann's or 0.9% Sodium Chloride).
Start patient on a fluid balance chart as soon as fluids have been prescribed and given.

Monitor response to each fluid challenge and repeat if :

- the systolic blood pressure remains <90 mmHg or 40 mmHg lower than usual SBP, (MAP< 65 mmHg) ,
- patient's mental state is not back to baseline
- lactate > 2mmol/l
- urinary output not restored

Stop iv fluid resuscitation if there are signs of fluid overload and consider the need for diuresis to offload fluids.

If 20 ml /kg have been administered (NICE NG51) and the patient remains poorly perfused (low BP, altered mental state, high lactate, reduced urinary output) consider further senior review to consider ceiling of care , further fluid bolus, inotrope therapy, Critical Care Team input.

5.4.6.MONITOR

- **Urine output and fluid balance**

Consider catheterisation and **start fluid balance** chart if not done before.

Urine output correlated with BP measurement provides a better way of assessing circulatory status in a septic unwell patient.

The target urine output is a minimum of 0.5 ml/kg/hr. If this cannot be achieved, consider catheter blockage or development of acute kidney injury . If none is present and patient already received maximum fluid challenge,ask for senior review.

- **Serial lactate**

Lactate level higher than 2.5 mmol/L is associated with an increase in mortality. Lactate levels higher than 4 mmol/L in patients with suspected infection, have been shown to yield a 5-fold increase in the risk of death and are associated with a mortality approaching 30%.

Dynamic changes of serum lactate levels in response to fluid challenges is an excellent predictor of response to therapy and outcome. The lactate should be measured at least every hour until it has normalised.
Failure to reduce serum lactate below 4 mmol/l after repeated iv fluid challenges to a total of 20 ml/kg (and correction of hypoxia if needed) is an indication of sepsis shock and needs urgent referral to Critical Care or urgent patient advanced care decisions.

- **NEWS 2**

Monitor NEWS 2 according to Clinical Decision Support Framework above and following recommendations from Observations and Escalation for Adult Patients Guideline opac-retrieve-file.pl (koha-ptfs.co.uk)

5.5 Secondary review and monitoring

After the initial assessment and resuscitation, the patient should have a patent airway, adequate ventilation and fluid resuscitation should have commenced. These need to be rechecked regularly.

Perform investigations to confirm or clarify problems that are clinically evident, or to look for complications that are likely in each particular clinical setting. Investigations will be governed by clinical picture and case specifics . (See Apendix 2 for more details)
Monitoring should be generally guided by the Observations and Escalation for Adult Patients Guideline opac-retrieve-file.pl (koha-ptfs.co.uk)

5.6. Further care

If the patient's condition fails to improve or worsens then referral to the critical care team is mandatory, except in cases where aggressive treatment is considered inappropriate. A senior doctor should be contacted to discuss any limitations of therapy.

A referral to critical care should be considered for:

- Hypoxia despite high concentrations of inspired oxygen
- Persistent hypotension systolic BP <90mmHg or MAP <65mmHg despite an adequate fluid challenge as per guidance above
- Persistent altered mental state (if this is new for patient)
- Urine output <0.5ml/kg/h despite appropriate fluid resuscitation

6.0 Post sepsis follow up and advice

Sepsis can result in physical, cognitive and psychological long-term sequelae.
Post Sepsis Syndrome (PSS) is a term used to describe the various
problems that can result following sepsis and it can occur in any sepsis survivor not just those that have had a critical care admission.

Symptoms of post-sepsis syndrome:

- Lethargy / excessive tiredness
- Poor mobility / muscle weakness
- Breathlessness / chest pains
- Vertigo
- Swollen limbs (fluid retention)
- Joint pains
- Hair loss
- Dry / flaking skin and nails
- Taste changes
- Poor appetite
- Changes in vision
- Changes in sensation in limbs
- Repeated infections
- Reduced kidney function
- Difficulty sleeping, either difficulty getting to sleep or staying asleep
- Nightmares
- Hallucinations
- Panic attacks
- Disabling muscle or joint pain
- Difficulty concentrating
- Decreased cognitive (mental) functioning
- Loss of self-esteem
- Depression
- PTSD
- Extreme fatigue

The long-term effects of sepsis are poorly understood and there is a need for more research in this area.

Sepsis survivors require follow up and may need referral to specialist services.
It is every practitioners responsibility to familiarise themselves with local follow up arrangements.

Patients need to be informed of post sepsis syndrome symptoms and the fact that sometimes there is a long recovery period and an increased susceptibility to infections.

UHDB organises a monthly **Sepsis Support Group** for patients discharged after a diagnosis of sepsis**,** details about location and timings are advertised monthly on Intranet.

7.0 References and further reading:

- Sepsis Manual Seventh Edition UK Sepsis Trust
- NICE guideline 51. Sepsis: recognition, diagnosis and early management. National Institute for Health and Care Excellence. Updated 2024
- Statement on the initial antimicrobial treatment of sepsis, Academy of Royal Medical Six"., Version2, October 2022.
- Which lactate levels are associated with increased mortality in sepsis/septic shock? Author: Andre Kalil, MD, MPH; Michael R Pinsky, MD, CM, Dr(HC), FCCP, MCCM, Critical Care Medicine., Jan 2019
- Dellinger, R.P. & Schorr, C.A. A Users' Guide to the 2016 Surviving Sepsis Guidelines. Critical Care Medicine,March 2017:45(3):381-385
- Rhodes, A et al Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Critical Care Medicine, March 2017:45(3) DOI: 10.1097/CCM.0000000000002255
- Emergency oxygen use in adult patients, BTS https://www.brit-thoracic.org.uk/document-library/clinical-information/oxygen/emergency-oxygen-use-in-adult-patients-guideline/emergency-oxygen-use-in-adult-patients-guideline
- Observations and Escalation for Adult Patients Guideline opac-retrieve-file.pl (koha-ptfs.co.uk)
  NICE Guideline NG151. Neutropenic sepsis: prevention and management in people with cancer. National Institute for Health and Care Excellence. 2012. https://www.nice.org.uk/guidance/cg151/chapter/1-Recommendations#managingsuspected-neutropenic-sepsis-in-secondary-and-tertiary-care-
- The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) Singer et al. JAMA. 2016; 315 (8):801-810. doi:10.1001/jama.2016.0287

8.0 Documentation Controls

Development of Guideline:	Dr Alina Paunescu, Emergency Medicine Consultant, Trust Sepsis Clinical Lead, UHDB (2018 and 2024 version) Dr Paul Smith , Consultant in Anaesthesia and Intensive care, Queens Hospital Burton (2018 version)
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Review Date:	January 2028
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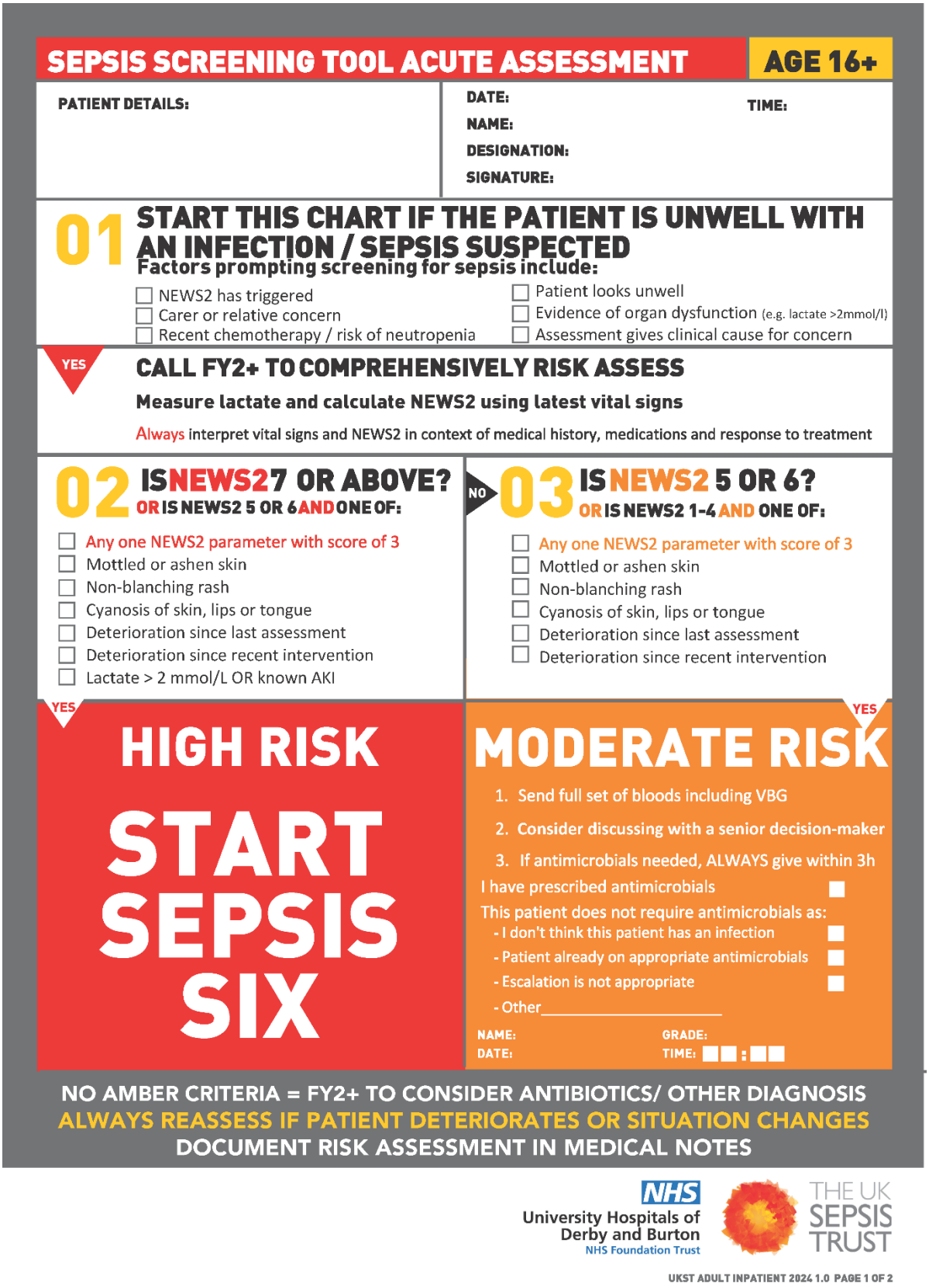
9.0Appendices

Appendix 1: Adult Sepsis Screening tool



SEPSIS SCREENING TOOL - THE SEPSIS SIX

AGE 16+

PATIENT DETAILS:	DATE:	TIME:
	NAME:	
	DESIGNATION:	
	SIGNATURE:	

COMPLETE ALL ACTIONS WITHIN ONE HOUR

01 INFORM SENIOR CLINICIAN

NOT ALL PATIENTS WITH RED FLAGS WILL NEED THE 'SEPSIS 6' URGENTLY. A SENIOR DECISION MAKER (ST3+ or equivalent) MAY SEEK ALTERNATIVE DIAGNOSES/ DE-ESCALATE CARE.

TIME □□:□□

02 GIVE OXYGEN IF REQUIRED

START IF O_2 SATURATIONS LESS THAN 92% - AIM FOR O_2 SATURATIONS OF 94-98%
IF AT RISK OF HYPERCARBIA AIM FOR SATURATIONS OF 88-92%

TIME □□:□□

03 SEND BLOODS INCLUDING CULTURES

BLOOD CULTURES, VBG, BLOOD GLUCOSE, LACTATE, FBC, U&Es, LFTs, CRP AND CLOTTING. LUMBAR PUNCTURE IF INDICATED,. CONSIDER RAPID PATHOGEN ID

TIME □□:□□

04 GIVE IV ANTIBIOTICS, THINK SOURCE CONTROL

MAXIMUM DOSE BROAD SPECTRUM THERAPY (CONSIDER ESCALATION IF ALREADY ON ANTIBIOTICS)

CONSIDER: LOCAL POLICY /ALLERGY STATUS /ANTIVIRALS

EVALUATE NEED FOR IMAGING/ SPECIALIST REVIEW TO HELP IDENTIFY SOURCE

IF SOURCE AMENABLE TO DRAINAGE ENSURE ACHIEVED AS SOON AS POSSIBLE BUT ALWAYS WITHIN 12H

TIME □□:□□

05 GIVE IV FLUIDS

GIVE BOLUS OF 500mL OVER 15 MINS IF LACTATE > 2mmol/L OR SBP < 90 mmHg. REPEAT IF NO IMPROVEMENT, IF NO IMPROVEMENT AFTER SECOND BOLUS CALL SENIOR (ST3+) TO ATTEND

TIME □□:□□

06 MONITOR

USE NEWS2. MEASURE URINARY OUTPUT: THIS MAY REQUIRE A URINARY CATHETER
REPEAT LACTATE AT LEAST HOURLY IF INITIAL LACTATE ELEVATED OR IF CLINICAL CONDITION CHANGES

TIME □□:□□

IF WORSENING/ NOT IMPROVING AFTER ONE HOUR – ESCALATE TO CONSULTANT
REASSESS NEWS2 AT LEAST EVERY 30 MINS

GOALS OF TREATMENT

- Systolic BP >90 mmHg (or MAP >65)
- UO >0.5 ml/kg/hr
- Resolution of metabolic acidosis
- Appropriate source control
- Improvement of acute confusion

RECORD ADDITIONAL NOTES HERE:

NHS University Hospitals of Derby and Burton NHS Foundation Trust

THE UK SEPSIS TRUST

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Appendix 2: Common initial investigations

Haematological	FBC (Full Blood Count), Coagulation screen Malaria blood film (malarial parasites) if history of travel abroad Confirm sickle cell / thalassaemia status if relevant family history or specific abnormalities on the FBC to suggest haemoglobinopathy
Biochemistry	Sodium, potassium, urea, creatinine Glucose Amylase (raised in pancreatitis, ischaemic bowel, perforated bowel) CRP (C-reactive protein) Liver function tests Troponin if myocardial infarction likely CK (creatinine kinase) **Procalcitonin**
Arterial Blood Gas (ABG) contraindicated if platelets <80	Respiratory function Acid-base balance Lactate
Venous Blood Gas **(VBG)**	**pH** – Good correlation (difference: +0.035 pH units) **pCO2** - Good correlation in normocapnia***, Non-correlative in severe hypotension*** (difference +/- 1.5 kPa; but varies greatly with blood flow) **HCO 3**- Good correlation (difference +/- 5.5mmol/l) **Lactate** - Dissociation above 2 mmol/L – if greater than 2 do ARTERIAL SAMPLE (difference +/- 0.3) **PO2** - values compare poorly
ECG	To exclude cardiac causes of hypotension or to differentiate sinus tachycardia from arrhythmia
Chest X-ray	To confirm clinical findings e.g. acute pneumonia or to investigate underlying lung disease

Microbiological	To confirm the presence of infection - samples depend on history and examination. A 'septic screen' may be required in difficult cases • Blood cultures • Sputum (protected catheter specimens or broncho-alveolar lavage may be available for intubated, ventilated patients) • Mid-stream urine (MSU) or catheter specimen of urine (CSU) • CSF (cerebrospinal fluid) where indicated via lumbar puncture. • Wound swabs from any suspected sites (including old cannula sites) • High vaginal swab • Stool for ova, cysts and parasites • Deeper infection may be clinically or radiologically evident. Samples may be amenable to percutaneous aspiration or sent after surgical drainage or debridement