



DOCUMENT TYPE: Guideline		UNIQUE IDENTIFIER: EBG00810	
DOCUMENT TITLE: Neutropenic Sepsis: Recognition, Diagnosis and Early Management in Adult Patients		VERSION NUMBER: 5	
SCOPE: All staff at LTH, particularly those involved in acute admission of cancer patients in the admission areas, Ribblesdale ward and oncology directorate.		STATUS: Ratified	
CLASSIFICATION: Organisational			
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REPLACES: Neutropenic Sepsis: Recognition, Diagnosis and Early Management in Adult Patients v4		HEAD OF DEPARTMENT: Dr Martin Hogg	
VALIDATED BY: Antimicrobial Management Group		DATE: 10 January 2022	
RATIFIED BY: Procedural Documents Ratification Group		DATE: 06 February 2022	
(NOTE: Review dates may alter if any significant changes are made).		REVIEW DATE: 28 February 2025	

AMENDMENT HISTORY

Version No.	Date of Issue	Page/Selection Changed	Description of Change	Review Date

Does this document meet the requirements of the Equality Act 2010 in relation to Race, Religion and Belief, Age, Disability, Gender, Sexual Orientation, Gender Identity, Pregnancy & Maternity, Marriage and Civil Partnership, Carers, Human Rights and Social Economic Deprivation discrimination? Yes

Document for Public Display: No

Evidence reviewed by Library Services 05/11/2021

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1. SUMMARY

Sepsis is defined as a life threatening condition that arises when the body's response to an infection injures its own tissues and organs. Neutropenic sepsis is defined as sepsis with a neutrophil count $<0.5 \times 10^9/L$.

Septic shock: Ref: UK Sepsis Trust (July 2016)

These patients can be identified as having a clinical construct of Sepsis with persistent hypotension (systolic blood pressure $<90\text{mmHg}$, following administration of 3 litres of IV fluids).

- Sepsis-Induced Hypotension Refractory (stubborn) to Fluid Resuscitation that requires vasopressors (specific medications) to maintain MAP ≥ 65 mmHg.
- A serum lactate level >2 mmol/L (18 mg/dL) despite adequate volume resuscitation.

Suspect neutropenic sepsis in patients having anticancer treatment within the last month who become unwell:

- NEWS ≥ 5 or 3 in any 1 parameter.
- And / or patients looks sick.

From Diagnosis to implementation of Sepsis 6, should be within 60 minutes.

2. PURPOSE

- To support all health care providers in the early recognition, response and management of all adult patients with suspected or confirmed neutropenic sepsis.
- Promote use of the Sepsis 6 within 60 minutes for Red Flag sepsis/Septic shock.
- Promote good antimicrobial stewardship.

3. SCOPE

All staff at LTH, particularly those involved in acute admission of cancer patients in the admission areas, Ribblesdale ward and oncology directorate.

4. GUIDELINE

Escalation plan/treatment: For immediate information refer directly to sepsis screening and action tool.

<http://intranet.lthtr.nhs.uk/download.cfm?doc=docm93jjm4n5276.pdf&ver=8492>

A patient who has had recent chemotherapy (within 6 weeks) who presents with a raised NEWS (Total score of 5 or above, or 3 in 1 parameter) and / or patient looks sick / confirmed infection will follow the screening and action tool.

The Escalation plan on the reverse of the NEWS chart and the screening tool support points of contact to support escalation. Parent team, Critical Care Outreach (bleep 3388 RPH, 3456 CDH) or Hospital at Night (bleep 9090).

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Implementing the Sepsis screening and action tool during patient assessment and escalation will support rapid review by ST3 & above, or equivalent grade. Use of the sepsis tool will also support implementation of the Sepsis 6, or review and reassessment within the appropriate time frame.

The Sepsis screening and action tool will form part of the patient documentation and must be included within the patient's case notes. On-going review, reassessment and antimicrobial stewardship must be documented clearly.

Definitions: Ref: NG51 (July 2016).

High Risk Criteria:

If Red Flags are identified, initiate treatment on the Sepsis pathway immediately. If unresponsive to treatment, refer directly to Critical Care registrar (Bleep 3186), Critical Care Outreach (bleep 3388 RPH, 3456 CDH) or Hospital at Night (bleep 9090).

- Objective evidence of new altered mental state.
- Respiratory rate 25 breaths per minute or more, OR new need for oxygen (more than 40% FiO₂) to maintain saturation more than 92% (or more than 88% in known chronic obstructive pulmonary disease).
- Heart rate 130 beats per minute or above.
- Systolic blood pressure 90 mmHg or less, or drop >40mmHg below normal.
- Not passed urine in previous 18 hours, or for catheterised patients passed less than 0.5ml/kg of urine per hour.
- Mottled or ashen appearance, cyanosis of skin, lips or tongue, non-blanching rash of skin.
- Recent chemotherapy (within 28 days).
- Lactate 2 mmol/l or greater.

Moderate to high risk criteria:

- History from patient, friend or relative of new onset of altered behaviour or mental state.
- History of acute deterioration of functional ability.
- Impaired immune system (illness or drugs including oral steroids).
- Trauma, surgery or invasive procedures in the last 6 weeks.
- Respiratory rate 21-24 breaths per minute.
- Heartrate 91-130 beats per minute (for pregnant women 100-130 beats per minute) or new onset arrhythmia.
- Systolic blood pressure 91-100mmHg.
- Not passed urine in the past 12-18 hours, or for catheterised patients 0.5-1ml/kg of urine per hour.
- Tympanic temperature less than 36 degrees Celsius.
- Signs of potential infection, including redness, swelling or discharge at surgical site or breakdown of wound.

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Low Risk Criteria:

Suspected sepsis but;

- Normal behaviour.
- No high risk or moderate to high risk criteria met.

Death certificate: Death from Neutropenic Sepsis should be as per NCEPOD recommendations included on the death certificate.

Coding/definitions: The term Red Flag Sepsis can still be coded as Sepsis for the information of clinical coding.

Management

First line antibiotics should be given within 1 hour of triage / neutropenic sepsis being suspected.

It is Vital that time of first dose of antibiotics is accurately recorded.

If patient has red flag / high risk sepsis follow sepsis screening and action tool, sepsis guidelines, perform sepsis six and consider referral to critical care.

(NB: Consult Product Information literature for dose reductions in liver and renal impairment and LTH antibiotic guidance available on intranet).

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	Patient NOT penicillin allergic	Penicillin allergy (not anaphylaxis)	Penicillin allergy (anaphylaxis)
1st Line	Piperacillin-Tazobactam 4.5g IV qds	Meropenem 1g IV tds	Teicoplanin 12mg/kg based on ABW rounded up to nearest 200mg (max 1g) IV bd for 3 doses, then od AND Ciprofloxacin** 400mg IV bd AND Metronidazole 500mg IV tds
2nd Line (i.e. if not responding to 1st line therapy)	Piperacillin-Tazobactam 4.5g IV qds AND Gentamicin* 5mg/kg (use extended interval gentamicin dosing calculator) (max 500mg) IV as a single stat dose. If recent platinum based chemotherapy or urological malignancies/urinary obstruction give, Meropenem 1g IV tds.	Continue Meropenem 1g IV tds and discuss with Microbiology	Teicoplanin 12mg/kg based on ABW rounded up to nearest 200mg (max 1g) IV BD for 3 doses, then od AND Ciprofloxacin** 400mg IV bd AND Metronidazole 500mg IV tds AND Gentamicin* 5mg/kg (use extended interval gentamicin dosing calculator), (max 500mg) IV as a single stat dose. If recent platinum based chemotherapy or urological malignancies/urinary obstruction, discuss with microbiology.
If high probability of line infection or Known MRSA	ADD to the above regimen Teicoplanin 12mg/kg based on ABW rounded up to nearest 200mg (max 1g) IV bd for 3 doses, then od if not already receiving.		

***Refer to the extended interval gentamicin dosing policy for full dosing and monitoring guidelines, this can be found in the Adult Antimicrobial Guideline (via Tap on the Bugs app or <http://lthtr-documents/current/P915.pdf>). Dose adjustments may be required in renal impairment.**

****Consider the safety issues with Fluoroquinolone – See MHRA drug safety alerts**
Need for further doses of gentamicin to be decided by consultant oncologist.

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Oral Switch

- Ciprofloxacin 750mg po bd AND Co-amoxiclav 625mg po tds.
- **Penicillin allergy (anaphylaxis and non-anaphylaxis)**, Ciprofloxacin 750mg po bd AND Clindamycin 450mg po qds.

Duration

Continue inpatient empiric antibiotic therapy in all patients who have unresponsive fever unless an alternative cause of fever is likely.

Discontinue empiric antibiotic therapy in patients whose neutropenic sepsis has responded to treatment, irrespective of neutrophil count.

Typical duration- 5-7 days including IV.

Information for Patients and Relatives

The Trust uses the UK Sepsis Trust information booklets, "SEPSIS: A guide for patients and relatives". These are available for relatives in the waiting areas within Critical Care, at the follow up clinic visit post critical illness. Patients admitted to Critical Care with Sepsis will be given a booklet as part of their routine follow up visit by the Critical Care Outreach team. All patients discharged from hospital following an episode of Sepsis should be provided with information regarding sepsis and recovery.

Procedure for Discharge of Patients with Low Risk Febrile Neutropenia

Decision for early discharge should be made by a consultant oncologist or haematologist or by the on call oncology registrar (who should only allow discharge following discussion with the consultant on call).

Patients should be discharged home with a copy of the patient information sheet.

It is the discharging doctor's responsibility to assess the patient's understanding of the information and that they fulfil criteria for early discharge on oral antibiotics.

The discharging doctor should ensure that the patient's telephone details are recorded accurately on the quadramed system and inform the chemotherapy support team.

The chemotherapy support team will call the patient within 24 hours of discharge to reassess symptoms and answer any questions.

The chemotherapy support team is responsible for checking all culture results and arranging review or change of antibiotics if appropriate.

Patients, in whom there has been any deterioration, should be re-admitted.

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5. AUDIT AND MONITORING

Compliance will be prospectively audited by the acute oncology team and reported monthly within sepsis reports to admission area leads. Annual audits will be presented at acute oncology network meetings.

Monthly neutropenic sepsis audit results will be sent to all admission areas. Compliance is included in the reports and cascaded to Clinical leads.

6. TRAINING

TRAINING		
Is training required to be given due to the introduction of this policy? No		
Action by	Action required	Implementation Date

7. DOCUMENT INFORMATION

ATTACHMENTS	
Appendix Number	Title
Appendix 1	Equality, Diversity & Inclusion Impact Assessment Form

OTHER RELEVANT / ASSOCIATED DOCUMENTS	
Unique Identifier	Title and web links from the document library
MS147	Sepsis Screening and Action Tool http://intranet.lthtr.nhs.uk/download.cfm?doc=docm93jjim4n5276.pdf&ver=8492
RMP-C-114	Procedure for Prescribing Antimicrobials http://lthtr-documents/current/P5.pdf
EBG00599	Sepsis: Recognition, Diagnosis and Treatment http://lthtr-documents/current/P754.pdf
Leaflet	Neutropenic sepsis patient leaflet http://intranet.lthtr.nhs.uk/download.cfm?doc=docm93jjim4n5049.pdf&ver=8082

SUPPORTING REFERENCES / EVIDENCE BASED DOCUMENTS	
References in full	
Checked by library ET 05/11/2021	
Number	References
1	Merriam-Webster (2021) <i>Septic shock</i> . [Online] Available at: https://www.merriam-webster.com/dictionary/septic%20shock [Accessed

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	05 November 2021].
2	National Confidential Enquiry into Patient Outcome and Death (2015) <i>Just say sepsis! A review of the process of care received by patients with sepsis</i> . London, NCEPOD.
3	National Institute for Health and Care Excellence (2016) <i>Sepsis: recognition, diagnosis and early Management</i> . NG 51. London, NICE.
4	NHS England (2015) <i>Improving outcomes for patients with sepsis: A cross-system action plan</i> . Redditch, NHS England.
5	Parliamentary and Health Service Ombudsman (2013) <i>Time to act - Severe sepsis: rapid diagnosis and treatment saves lives</i> . London, PHSO.
6	National Institute for Health and Clinical Excellence (2012) <i>Neutropenic sepsis: prevention and management of neutropenic sepsis in cancer patients</i> . London, NICE.
Bibliography	

DEFINITIONS / GLOSSARY OF TERMS

Abbreviation or Term	Definition
LTH	Lancashire Teaching Hospitals
NICE	National Institute for Clinical Excellence
NEWS	National Early Warning Score
ST	Specialist Trainee
RPH	Royal Preston Hospital
CDH	Chorley District Hospital
NCEPOD	National Confidential Enquiry Patient Outcomes and Death

CONSULTATION WITH STAFF AND PATIENTS

Enter the names and job titles of staff and stakeholders that have contributed to the document

Name	Job Title	Date Consulted
Antimicrobial Guidelines Group		10 January 2022

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DISTRIBUTION PLAN	
Dissemination lead:	Dr C Mitchell
Previous document already being used?	Yes
If yes, in what format and where?	Online trust guidelines, no print copies in use
Proposed action to retrieve out-of-date copies of the document:	Old online guidelines to be replaced
To be disseminated to:	Trust Wide
Document Library	
Proposed actions to communicate the document contents to staff:	Include in the LTHTR weekly Procedural documents communication– New documents uploaded to the Document Library

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Equality, Diversity & Inclusion Impact Assessment Form

Department/Function	Oncology			
Lead Assessor	Dr Catherine Mitchell			
What is being assessed?	Impact of Neutropenic Sepsis guidelines			
Date of assessment	13/12/2021			
What groups have you consulted with? Include details of involvement in the Equality Impact Assessment process.	Equality of Access to Health Group	<input type="checkbox"/>	Staff Side Colleagues	<input checked="" type="checkbox"/>
	Service Users	<input type="checkbox"/>	Staff Inclusion Network/s	<input type="checkbox"/>
	Personal Fair Diverse Champions	<input type="checkbox"/>	Other (Inc. external orgs)	<input type="checkbox"/>
	Discussed with sepsis working group			

1) What is the impact on the following equality groups?		
Positive:	Negative:	Neutral:
<ul style="list-style-type: none"> ➤ Advance Equality of opportunity ➤ Foster good relations between different groups ➤ Address explicit needs of Equality target groups 	<ul style="list-style-type: none"> ➤ Unlawful discrimination, harassment and victimisation ➤ Failure to address explicit needs of Equality target groups 	<ul style="list-style-type: none"> ➤ It is quite acceptable for the assessment to come out as Neutral Impact. ➤ Be sure you can justify this decision with clear reasons and evidence if you are challenged
Equality Groups	Impact (Positive / Negative / Neutral)	Comments:
		<ul style="list-style-type: none"> ➤ Provide brief description of the positive / negative impact identified benefits to the equality group. ➤ Is any impact identified intended or legal?
Race (All ethnic groups)	Neutral	
Disability (Including physical and mental impairments)	Neutral	
Sex	Neutral	
Gender reassignment	Neutral	
Religion or Belief (includes non-belief)	Neutral	
Sexual orientation	Neutral	
Age	Negative	This guideline only applies to adult patients
Marriage and Civil Partnership	Neutral	
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Pregnancy and maternity	Negative	This Document excludes Pregnancy and Maternity patients
Other (e.g. caring, human rights, social)	Neutral	

2) In what ways does any impact identified contribute to or hinder promoting equality and diversity across the organisation?	
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3) If your assessment identifies a negative impact on Equality Groups you must develop an action plan to avoid discrimination and ensure opportunities for promoting equality diversity and inclusion are maximised.
➤ This should include where it has been identified that further work will be undertaken to further explore the impact on equality groups
➤ This should be reviewed annually.

ACTION PLAN SUMMARY		
Action	Lead	Timescale

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HOW THE NHS CONSTITUTION APPLIES TO THIS DOCUMENT

WHICH PRINCIPLES OF THE NHS CONSTITUTION APPLY? Click here for guidance on Principles	Tick those which apply	WHICH STAFF PLEDGES OF THE NHS CONSTITUTION APPLY? Click here for guidance on Pledges	Tick those which apply
1. The NHS provides a comprehensive service, available to all. 2. Access to NHS services is based on clinical need, not an individual's ability to pay. 3. The NHS aspires to the highest standards of excellence and professionalism. 4. The patient will be at the heart of everything the NHS does. 5. The NHS works across organisational boundaries. 6. The NHS is committed to providing best value for taxpayers' money. 7. The NHS is accountable to the public, communities and patients that it serves.	✓ ✓ ✓ ✓ <input type="checkbox"/> ✓ ✓	1. Provide a positive working environment for staff and to promote supportive, open cultures that help staff do their job to the best of their ability. 2. Provide all staff with clear roles and responsibilities and rewarding jobs for teams and individuals that make a difference to patients, their families and carers and communities. 3. Provide all staff with personal development, access to appropriate education and training for their jobs, and line management support to enable them to fulfil their potential. 4. Provide support and opportunities for staff to maintain their health, wellbeing and safety. 5. Engage staff in decisions that affect them and the services they provide, individually, through representative organisations and through local partnership working arrangements. All staff will be empowered to put forward ways to deliver better and safer services for patients and their families. 6. To have a process for staff to raise an internal grievance. 7. Encourage and support all staff in raising concerns at the earliest reasonable opportunity about safety, malpractice or wrongdoing at work, responding to and, where necessary, investigating the concerns raised and acting consistently with the Employment Rights Act 1996.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ✓ <input type="checkbox"/>
WHICH AIMS OF THE TRUST APPLY? Click here for Aims	Tick those which apply <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	WHICH AMBITIONS OF THE TRUST APPLY? Click here for Ambitions	Tick those which apply ✓ <input type="checkbox"/> ✓ <input type="checkbox"/>

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