University Hospitals of Leicester NHS
NHS Trust

Policy for the management of adult patients with neutropenia

Approved By:	Policy and Guideline Committee Chair's urgent approval process
Date Approved:	16 May 2018
Trust Reference:	**B6/2018**
Version:	3
Supersedes:	2 – September 2019
Author / Originator(s):	Dr Kate Hodgson, Consultant Haematologist Ruth Robinson, Macmillan Acute Oncology ANP
Executive lead:	Medical Director
Latest Review Date	29 July 2022 – Policy and Guideline Committee
Next Review Date:	**September 2025**

CONTENTS

REVIEW DATES AND DETAILS OF CHANGES MADE DURING THE REVIEW

No significant alterations at review September 2022 as no update in national guidance or local practice.

KEY WORDS

Neutropenia, Neutropenic sepsis, chemotherapy, cancer,

1 INTRODUCTION

1.1 This document sets out the University Hospitals of Leicester (UHL) NHS Trusts Policy and Procedures for the safe management of adult patients with neutropenia. Neutrophils are the most numerous type of white blood cell and are critical for stopping bacteraemia from developing into septicaemia. Neutropenia can be defined as a neutrophil count below the lower limit of normal, which in UHL is 1.5 $x10^9$/L. Severe neutropenia is defined as a neutrophil count below 0.5 $x10^9$/L.

1.2 Neutropenia (a reduction in the number of neutrophils in the peripheral blood) is the result of reduced production (bone marrow failure) or increased consumption (less common, as a result of infection or autoimmunity). Most commonly bone marrow failure is a consequence of chemotherapy or bone marrow diseases such as leukaemia. As such, the majority of patients with neutropenia will be under the care of consultant haematologists or oncologists. However, patients under the care of other consultants may have neutropenia as a consequence of therapy (e.g. rheumatology patients on methotrexate) or may present with neutropenia for unknown reasons. Neutropenic patients are more susceptible to developing infections, but this will vary dependent on the cause, severity and duration of neutropenia.

1.3 Suspected neutropenic sepsis is a medical emergency and must be treated with broad spectrum antibiotics without delay. The care of patients with neutropenic sepsis should follow the Sepsis and Septic Shock UHL guideline.

2 POLICY AIMS

2.1 The aims of this policy are:

- To prevent the transfer of infection to highly susceptible patients.
- To reinforce to staff and visitors the high risk of infection and the need for prompt action if signs of infection develop.
- To deal swiftly with any developing infection, instigating appropriate action by following the Sepsis and Septic Shock UHL guideline.

2.2 In addition the aims of care during neutropenic sepsis are:

- Provision of appropriate treatment and supportive measures
- Appropriate monitoring of the patient to detect any deterioration

3 POLICY SCOPE

3.1 This guideline applies to all medical and registered nursing and nursing associate staff employed by UHL, including bank, agency and locum staff, who are involved in the care of patients with neutropenia. This will most often be haematology and oncology medical, nursing and allied health professional staff, but may involve other staff in UHL who are looking after neutropenic patients. Where patients are under the care of other clinical teams, the haematology on-call registrar or consultant is always available via switchboard for advice about management.

3.2 Any adult patient with a neutrophil count <1.5 $x10^9$/L is covered by this policy. Patients with acquired immune deficiency syndrome (AIDS) or chronic bone marrow disease may also require similar consideration. The following groups

require particular consideration as they are at particular risk of neutropenic sepsis:

- Any patient with a neutrophil count of 0.5 or less, or whose neutrophil count is expected to fall below 0.5 in the next two days (because of known treatment)
- Patients receiving more aggressive cyclical chemotherapy (e.g. for acute leukaemia, lymphoma, and breast cancer)
- Any patient with newly diagnosed acute leukaemia
- Any patient who is, or will be, receiving, high dose chemotherapy.

3.3 Those patients on a valid end-of-life care pathway or with an advance directive limiting treatment in place should not be subject to the strictures of this policy; prevention and treatment of infection is not the priority. Sensitive end of life care should be provided to ensure that monitoring and treatment is only undertaken to provide comfort and symptom control.

4 DEFINITIONS

Neutrophil count ($x10^9$/L)	Risk of infection	Comments
1.0 to 1.5	No significant increase	Infections are most likely to be treatable as an outpatient with oral antibiotics
0.5 to 1.0	Some increase	Infections may be treatable as an outpatient with oral antibiotics
Below 0.5	Major increase	All infections must be treated with IV antibiotics as an inpatient initially.

(ref CTCAE version 4)

5 ROLES AND RESPONSIBILITIES

5.1 Responsibilities within the Organisation

1. Executive lead for the policy is the Medical Director
2. CHUGGS Infection Prevention Committee: responsible for dissemination of policy, audit of compliance and ensuring on-going review
3. Microbiology: responsible for monitoring antibiotic resistance and infection patterns and informing the choice of antibiotics based on these results.
4. Line managers: responsible for ensuring their staff are aware of the policy and adhere to it; ensuring staff have appropriate competencies
5. Individual practitioners: responsible for maintaining knowledge and competence and identifying own limitations

6 POLICY STATEMENTS, STANDARDS*, PROCESSES*, PROCEDURES* AND ASSOCIATED DOCUMENTS

6.1 Patients having anti-cancer treatment and their carers' are provided with written and oral information at various points during their treatment to ensure that they

understand neutropenic sepsis, how and when to contact the oncology and haematology advice line (24 hours a day) and the importance of not using standard means to access care (e.g. not their GP or the Emergency Department unless directed to by the helpline).

Refer: Appendix 1: Patient education and information

6.2 Staff who answer the haematology and oncology helpline are trained in a standardised response using the UKONS form. Further advice is readily available from the oncology SpR or consultant (for oncology patients) and the haematology SpR or consultant (for all other neutropenic patients).

Refer: Appendix 2: Responding to a call on the 24 hour helpline

6.3 Adult patients (aged 18 years and older) with acute leukaemia, stem cell transplants or solid tumours including lymphoma in whom significant neutropenia (neutrophil count 0.5×10^9 per litre or lower) is an anticipated consequence of chemotherapy are offered prophylaxis with levofloxacin. This should be taken during the expected period of neutropenia only, and is built into the relevant electronic chemotherapy prescriptions on Chemocare. Support of the neutrophil count with GCSF may be considered either to support dose intensification or where the patient has had a previous episode of neutropenic sepsis.

6.4 Patients at risk of neutropenia for other reasons (e.g. dermatology or rheumatology patients on disease modifying agents) have similar education and access to timely advice. Where patients on disease modifying agents for rheumatological or dermatological disease are admitted and found to be neutropenic, the on-call rheumatology or dermatology specialists are also available for advice to the admitting team.

6.5 The haematology laboratory staff will contact the clinical team in charge of patients when an unexpected or unexplained neutropenia ($<1\times10^9$) is detected from a full blood count. The on-call haematology SpR or consultant is available for advice about any aspect of the management of these patients.

6.6 Patients with neutropenia require protection from infection transmission, especially when admitted to hospital. This is covered by UHL protective isolation guidelines. Not all patients with neutropenia will need to be nursed in isolation. It is the decision of the medical team in charge of the patient; where the patient is not under the direct care of a haematology or oncology consultant, advice about isolation is available from the on-call haematology SpR or consultant. Patients with neutropenia who are admitted but do not have symptoms or signs of infection must have observations and early warning score performed at a minimum of every 4 hours.

6.7 Patients who are known to be neutropenic or who have had anti-cancer therapy in the preceding six weeks are to be treated with empirical antibiotics for presumed neutropenic sepsis if they are unwell. This is a medical emergency and empirical antibiotics are to be given within 1 hour and before confirming neutropenia. Signs of infection in neutropenic patients are:

- Temperature >38°C or >37.5°C on 2 occasions 30 minutes apart
- Temperature <36°C
- Other signs and symptoms consistent with infection

6.8 Patients with suspected neutropenic sepsis must be managed according to the UHL Sepsis Care Pathway. Neutropenia or chemotherapy within 6 weeks is an

automatic red flag. Senior review and escalation to critical care outreach or ITU are appropriate.

6.9 In oncology and haematology patients with neutropenia, a stat dose of Tazocin 4.5g i.v. is preferable for patients without contra-indication given the likely causative organisms in this patient group. However, if tazocin is not readily available, meropenem 1g i.v. given promptly is preferable to any delay. The addition of vancomycin i.v. should be considered where there is concern about indwelling venous access device infection or significant mucositis. Where appropriate, the initial dose may be given by a nurse on a PGD.

6.10 Further doses of antibiotics are prescribed once the patient is confirmed to be neutropenic. Antibiotic prescriptions are written with a review date rather than a stop date to prevent critical treatment being inappropriately withheld. The management of persistent fever in a neutropenic patient should be discussed with the senior medical team and microbiology; junior medical staff should not change antibiotics or add antifungals without discussion with a senior doctor unless following a clear plan that has been documented in the patient record.

Refer to Sepsis and Septic Shock UHL guideline (B11/2014), Antimicrobial guideline for febrile neutropenia (Antimicrobial website)

6.11 Empirical antibiotic therapy should be discontinued after a course of treatment in patients whose neutropenic sepsis has responded to that treatment (resolution of fever and improvement in NEWS), irrespective of neutrophil count. In selected patients, it may be appropriate for prolonged courses of antibiotics but these decisions should always involve the senior medical team and microbiology.

6.12 Patients with chemotherapy induced neutropenia at low risk of developing septic complications as assessed by a senior clinician supported by the MASCC score may be considered for conversion to oral antibiotics and early discharge, provided the patients clinical and social circumstances are appropriate and the patient understands the need to return to hospital if their clinical condition deteriorates.

This policy is supported by the following processes / procedures / standards found in the associated documents as detailed below, which must be used in conjunction with this policy:

Procedure / Process / Standard	Location/insite code
Clinical guideline for Dietary Management of Neutropenic Patients	Insite B38/2008
Sepsis and Septic Shock UHL guideline	Insite B11/2014
Antimicrobial guideline for febrile neutropenia	Antimicrobial website

7 EDUCATION AND TRAINING REQUIREMENTS

7.1 All nurses who hold the haematology oncology helpline telephone are chemotherapy trained and have annual assessment of their competency using the UKONS tool

7.2 Junior doctors and all new nurses (registered and nursing associates) working in the Osborne Building have an induction which includes knowledge of this policy and the initial management of neutropenic sepsis. However, they are not experts,

and advice should always be sought from registrars or consultants in haematology or oncology.

7.3 UHL staff who would like additional training in this area can access the following e-learning available on the Macmillan Learn Zone

- Acute oncology: neutropenic sepsis
- Avoidable death

8 PROCESS FOR MONITORING COMPLIANCE

8.1 Compliance with this policy will be subject to on-going audit and presented to the audit meetings in haematology and oncology.

8.2 The treatment of patients who are admitted due to neutropenic sepsis is the subject of a national audit with which the trust complies

8.3 The key indicators that will be audited are laid out in the monitoring table (appendix 3)

9 EQUALITY IMPACT ASSESSMENT

9.1 The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.

9.2 As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

10 SUPPORTING REFERENCES, EVIDENCE BASE AND RELATED POLICIES

NICE guidelines [CG151] Neutropenic sepsis: prevention and management in people with cancer. There are useful flow charts for expected processes related to the topic. https://www.nice.org.uk/guidance/cg151

MASCC score MASCC Risk Index for Febrile Neutropenia - MDCalc

Isolation Precautions UHL Policy (including A-Z of conditions and Personal Protective Equipment B62/2011

11 PROCESS FOR VERSION CONTROL, DOCUMENT ARCHIVING AND REVIEW

11.1 This document will be uploaded onto SharePoint and available for access by Staff through INsite. It will be stored and archived through this system.

11.2 It will be reviewed by the authors on a biennial basis

.

Patient education and information

Prior to commencing chemotherapy

Patient education and information prior to commencing chemotherapy can be delivered to a group of patients or individually. If delivered to a group there must be time allocated to allow any individual discussions.

The purpose is to ensure the patient can give informed consent for chemotherapy treatment, understands precautions to take during treatment and the importance of reporting side effects of treatment.

1. The patient must be informed of;
    a. How chemotherapy works
    b. The type of chemotherapy they will be receiving
    c. How it is administered, the frequency and how long it takes to administer
    d. Tests and investigations required prior to each cycle
    e. Side effects of the chemotherapy
    f. The need to purchase a digital thermometer if they do not currently have one at home (these can be purchased from the information centre, ground floor, Osborne building, any chemist and supermarkets)
    g. The opportunity for scalp cooling (where appropriate) and wig referral
    h. The opportunity to discuss fertility options with the assisted conception unit
    i. Where practical, financial and emotional support can be sought

2. The patient must be educated about;
    a. The risk of infection during treatment
    b. How to reduce the risk of infection
    c. Tips to reduce the impact of common side effects e.g. nausea and vomiting
    d. How to look after their mouth to reduce the incidence of mucositis
    e. Protecting their skin against the effects of the sun
    f. The impact of chemotherapy on fertility and the importance of using contraception (the latter should be discussed regardless of age)
    g. Which vaccines can be received during chemotherapy treatment
    h. How to report any side effects or if feeling unwell during treatment

3. The patient must be provided with the following written information to support that given verbally
    a. Chemotherapy: Advice on staying well during your treatment (CAN037)
    b. Card containing 24 hour helpline contact number
    c. Macmillan leaflet Avoiding infection when you have reduced immunity
    d. UHL leaflet Understanding and preventing infections
    e. The Macmillan information leaflet about the specific regime the patient will be receiving (ensuring any local differences are amended)
    f. How to look after you mouth (CAN083)
    g. Contact details of Macmillan dietetic assistant (oncology) **or** Dietary advice for haematology patients with neutropenia
    h. Appointment details

i. Details of who to contact if any comments, queries or concerns about their experience during chemotherapy treatment

After the patient has been provided with information and educated on how to care for themselves during treatment, their understanding must be checked to ensure they have understood the information that has been given. This should consist of asking the patient to repeat which side effects or symptoms must be reported.
The importance of the risk of infection and reporting symptoms must be reinforced again at the end of the session.
NB information should be provided in a form that the patient can understand. Language spoken and any learning or sight disabilities should be taken into account.

Prior to the first cycle of chemotherapy
The patient's understanding of the following must be checked prior to receiving their first cycle of chemotherapy.

1. The chemotherapy they are to receive
2. The common side effects of the chemotherapy
3. Which side effects or symptoms must be reported and how to report
4. Precautions to take to reduce the risk of infection during treatment

Any areas where understanding is limited should be explained and understanding checked

Prior to each subsequent cycle
The following should be checked prior to each cycle

1. Any side effects that may have occurred following the previous cycle (particularly any that were not reported and resolved between cycles since the severity may increase with subsequent cycles in some instances)
2. If the patient took any medication provided to take at home was taken correctly

Re-educate as appropriate and reinforce the importance of reporting side effects or symptoms.

Responding to a call on the 24 hour helpline

This applies to adult oncology/haematology patients who are currently receiving or have received chemotherapy in the past 6 weeks or at risk from disease/treatment related immunosuppression.

When a patient, family member or health care professional rings the 24 hour helpline complaining of symptoms or feeling unwell the following actions should be taken.

1. Record the call on the UKONS triage log sheet – each part of the form **MUST** be completed. Ask the patient to spell their name
2. Ask to speak to the patient directly to ensure the patient's perspective of symptoms is established
3. **All** toxicities/problems are assessed and graded according to assessment tool guidelines (Green, amber, red)
4. Advice and action should be according to the assessment tool, this should be recorded on the triage log sheet
    a. All green – patient may be managed at home. Instructions for care given to patient, and asked to ring back if situation changes
    b. 1 amber – patient may be managed at home but requires follow up phone call within 24 hours to assess for any deterioration **NB** 2 ambers = red
    c. 2 amber scores or 1 red score – patient requires face-to-face assessment and should attend OAU
5. All completed triage log sheets must be placed in the box file in OAU be 0900hrs the following morning
6. If the patient requires admission
    a. Inform the bed bleep holder
    b. Inform the on-call registrar
    c. Inform OAU nurse-in charge and take UKONS triage log sheet to OAU
7. If there are no beds on OAU and the patient is directed to attend the emergency department (ED), the acute oncology team must be informed (Mon-Fri 0900-1700hrs) who will see the patient in ED. Contact number 07908178232
8. Follow-up phone calls for patient with 1 amber score will be carried out by the acute oncology team Mon-Fri and OAU staff at weekends and bank holidays. BMTU staff will follow-up their own patients.

Appendix 3

POLICY MONITORING TABLE

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements	Lead(s) for acting on recommendations	Change in practice and lessons to be shared
Neutropenic sepsis audit	Acute Oncology Team	National audit to include: route of admission; diagnosis and tumour site; Time since last chemo; Chemo regimen; Door to needle time; Neutrophil count; Signs of sepsis; If on prophylactic antibiotics; If on prophylactic G-CSF	Annual	Haematology and oncology management meetings, CHUGGS quality and safety board and infection prevention committee	Haematology and oncology management meetings, CHUGGS quality and safety board and infection prevention committee	Dissemination through haematology and oncology management teams

Appendix 4

Advice for looking after a patient with unexpected neutropenia

Most neutropenia is caused by treatment for cancer; however, there are many other reasons that a patient may become neutropenic. This guidance is to assist the care of patients with unexpected neutropenia, wherever they may present