Somerset NHS Foundation Trust

Yeovil District Hospital

Protocol for the Management of Possible or Confirmed Neutropenic Sepsis in Adult Patients

Protocol

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This Version	1	**Status**	Final
Replaces	Current protocol		
Approval Date	16 November 2021	**Where**	CSSS Governance
Ratification Date	16 November 2021	**Where**	CSSS Governance
Date of issue	7 January 2022	**Review date**	November 2024
Applies to	Adult patients receiving chemotherapy who are febrile and are suspected or known to be neutropenic	**Exclusions**	none

CONTENTS

1.0 INTRODUCTION

1.1 Severe neutropenia (neutrophils < 1.0 x 10^{9}/L) is a major risk factor for both serious bacterial and fungal infections. Neutropenic sepsis is defined as 'infection in a patient with severe neutropenia'. Prompt assessment and the introduction of antimicrobial therapy are essential to prevent major morbidity and mortality.

1.2 The aim of this document is to set out the best practice, based on expert opinion, for the management of adult patients presenting with neutropenic sepsis. This incorporates recommendations from the NICE Clinical Guideline 151 published in September 2012 (See Reference 9.1).

2.0 RISK FACTORS

2.1 All chemotherapy drugs can cause neutropenia; this risk is increased if more than one agent is used.

2.2 A previous episode of neutropenia.

2.3 The presence of mucositis.

2.4 Chemotherapy related diarrhoea/dehydration.

2.5 An indwelling central line.

2.6 Elderly patients with significant co-morbidities eg IHD/COPD.

2.7 Particular attention should be paid to patients with an underlying immune deficiency e.g. patients with lymphoma, Hodgkin's disease, CLL, myeloma or previous bone marrow transplant.

These patients may have a serious infection in the presence of a "normal" neutrophil count.

3.0 SIGNS AND SYMPTOMS

3.1 The presentation of any one or a combination of the following, within 1 – 6 weeks following chemotherapy:

- Feeling generally unwell with or without a temperature.
- Temperature above 38º at any time or less than 36 º and feeling shivery, shaking and unwell
- General symptoms of infection including feeling hot and cold, shivers and/or rigors.
- Specific symptoms of infection such as sore throat, cough, dysuria, cellulitis etc.

- Hypotension and/or tachycardia
- Drowsiness/confusion

4.0 EARLY INTERVENTION REQUIRED

4.1 Patients suspected of having neutropenic sepsis should be assessed by a doctor at the earliest opportunity. Out of hours the GP should refer the patient for urgent review in the appropriate medical admissions unit of the nearest DGH. In a neutropenic patient, the occurrence of fever must be regarded as an emergency. Prompt assessment and the timely administration of IV antibiotics are essential. **Patients with suspected neutropenic sepsis should have intravenous antibiotics administered within 1 hour of presentation in hospital or within 1 hour of fever if patient already an in-patient.**

4.2 Assessment of patients with suspected neutropenic sepsis should include baseline FBC, renal function, liver function, CRP and lactate as well as appropriate cultures.

4.3 **Antibiotic treatment should not be delayed until the blood results are available in patients with suspected neutropenic sepsis**. **A Neutropenic Sepsis Alert Card is given to all patients receiving chemotherapy at Somerset Foundation Trust. This acts as a patient specific directive for immediate antibiotic delivery by an IV trained nurse to help prevent delays in antibiotic treatment in this patient group (see Appendix A). For YDH patients they should present their card on arrival at ED so that triage is expedited (appendix A).**

4.4 Nursing staff should use the NEW score for all patients suspected of neutropenic sepsis. The NEWS policy should be followed alongside the use of this policy and the Surviving Sepsis tool to ensure an appropriate level of response is made to the patient's condition. Patients who score 5 or more or those patients who score 3 in any one parameter require notification to Critical Care Outreach (Bleep 2226) and attendance by a doctor of seniority greater than STr3/SpR. Patients who score 7 or more require immediate review by Critical Care Outreach Team.

4.5 In-patients at St. Margaret's Hospice Taunton, in receipt of palliative myelosuppressive anti-cancer treatment and who have a temp trigger should be treated in line with the suspected neutropenic sepsis pathway as per appendix C

5.0 INTERVENTION REQUIRED FOLLOWING CLINICAL ASSESSMENT

5.1 The outcome of the clinical assessment will determine the level of intervention required. However, in all instances the following, as a minimum should be followed:

- Neutrophil count < 1.0 but patient clinically well and a MASCC score of ≥ 21/26 - the patient may have an early supported discharge with oral antibiotics. Advice should be given to contact the cancer helpline in event of further temperature spikes.
- Neutrophil count < 1.0 plus fever and/or one or more of the signs and symptoms highlighted in section 3 - admit and undertake the following based on the findings from clinical examination.
- Blood cultures (1 set each) from all lumens of a central venous catheter plus one from a peripheral vein. If there is no central venous catheter present then take two peripheral blood cultures.
- Urine sample (should be sent for culture and not just dip stick test).
- Do not perform a chest X-ray unless clinically indicated
- Throat swab, sputum culture and stool culture if indicated / available.
- Swab from exit site of central venous catheter if inflamed, or any other inflamed area.
- Empirical intravenous antibiotic therapy should be started immediately, following Trust Antibiotic guidelines.

5.2 Any current systemic anti-cancer treatment should be discontinued.

5.3 More specific advice can be obtained by contacting the Acute Haemato-Oncology Team (Bleep 3606) or the on-call Haematologist or Oncologist via MPH switch-board outside of normal working hours.

6.0 EMPIRICAL ANTIBIOTIC THERAPY

6.1 Recommended first line antibiotic therapy if the NEW score on admission is 6 or below is single agent **IV TAZOCIN 4.5g qds** unless the patient is penicillin allergic. If the NEW score is 7 or above then the recommended first line antibiotic therapy is single agent **MEROPENEM 500mg qds.**

The first dose of either antibiotic should not be delayed until the blood results are available in patients with suspected neutropenic sepsis. It must be given immediately when neutropenic sepsis is suspected.

- If Penicillin allergy is known give **MEROPENEM 500mg qds. The first dose of meropenem should not be delayed until the blood results are available in patients with suspected neutropenic sepsis.**

  Safety of meropenem in patients reporting penicillin allergy: lack of allergic cross reactions.

  Cunha BA[1], Hamid NS, Krol V, Eisenstein L. J Chemother. 2008 Apr;20(2):233-7.

- Addition of **IV VANCOMYCIN** to **IV TAZOCIN** as first line treatment should only be considered if central venous catheter infection is highly likely (inflamed, local pain,

tenderness)

- If IV access cannot be obtained and the NEW score is 6 or below, give **CIPROFLOXACIN 500mg bd orally**. If the NEW score is 7 or above, central access must be obtained immediately, and the policy followed as above.

- If the patient has a solid tumour malignancy and is found to be neutropenic then calculate the MASCC score – see 6.3.

6.2 **Further information about the prescribing and monitoring of vancomycin can be found in the Trust's Antimicrobial Prescribing Guidelines;**

http://intranet.tsft.nhs.uk/antimicrobialguidelines/Vancomycinprescribingandmonitoring/tabid/6365/language/en-GB/Default.aspx

https://viewer.rx-guidelines.com/TSTYDH/Abx#content,WrqktEOJLm

If unsure please liaise with a Consultant Microbiologist.

6.3 The MASCC Index below categorises solid tumour and lymphoma patients with febrile neutropenia into "severe" and "non-severe" (See Reference 9.2).

Characteristic		Score
Age	≥ 60	0
	< 60	2
Patient dehydrated needing fluids	No	3
	Yes	0
Patient hypotensive	Systolic BP <90	0
	Systolic BP ≥ 90	5
Does pt. have COPD	yes	0
	no	4
Solid tumour or no previous fungal infection in a haem malignancy	Solid tumour or no previous fungal infection in a haem malignancy	4
	Haem malignancy with previous fungal infection	0

Symptoms related to febrile episode	None or mild symptoms	5
	Moderate symptoms	3
	Severe symptoms	0
Was pt. already an IP before this episode of febrile neutropenia?	Already an IP	0
	Admitted with this episode	3

If score ≥21, treat as non-severe. Patient can be converted to oral antibiotics and discharged if well with follow up from the Acute Haemato-Oncology Team.

If in any doubt, treat as severe (see Appendix B for flow chart).

6.4 If fluid intake is poor then intravenous fluids should be given. If hypotension is present then colloid/crystalloid should be administered and consideration given to the early introduction of inotropes. In both situations fluid balance should be carefully monitored and the on-call Consultant Haematologist or Oncologist should be notified.

6.5 For patients on IV TAZOCIN who are not responding after 48hrs then IV TIGECYCLINE (100mg stat then 50mg 12 hourly) should be administered in addition to IV TAZOCIN. Further changes to antibiotics are only indicated by results of positive cultures or a clinical deterioration (NEWS 7 or above) when a change to IV MEROPENEM 500MG qds should be considered.

6.6 If there is no response after 96 hours following the administration of two different antibiotic regimens then the introduction of systemic antifungal therapy should be considered after discussion with the responsible Haematologist or Oncologist.

6.7 Please liaise with Microbiology if Tazocin is not available

7.0 MONITORING

7.1 In addition to the monitoring of antibiotic levels the following should be undertaken:

- Daily FBC, U&E's and CRP
- Vital signs (frequency should be dictated by clinical findings)
- Discontinue empiric antibiotic therapy in patients whose neutropenic sepsis has responded to treatment, irrespective of neutrophil count, after discussion with appropriate Haematologist or Oncologist

8.0 GENERAL CARE

8.1 The following should be implemented when providing care for a patient with suspected/ diagnosed neutropenic sepsis:

- The administration giving set and line (if not in continuous use) should be changed every 24 hours. Each set should be labelled with date and time to ensure consistency.
- The cannula should be changed every 72 hours. Sites should be rotated and prompt removal of the cannula on either completion of the course of treatment or if signs of local infection are noted.
- Central lines can be used; regular flushing with normal saline is required before and after each use.
- There is no requirement for isolation or barrier nursing for patients with neutropenic sepsis. This should only be undertaken if there is another clinical indication to do so.
- There should be no flowers within the room.
- The room should be cleaned daily.

9.0 REFERENCE

9.1 http://www.nice.org.uk/nicemedia/live/13905/60864/60864.pdf

https://www.nice.org.uk/guidance/cg151

9.2 The Multinational Association for Supportive Care in Cancer Risk Index: A Multinational Scoring System for Identifying Low-Risk Febrile Neutropenic Cancer Patients; Journal of Clinical Oncology 18: 3038-3051, 2000

10.0 KEY CONTACTS

Yeovil District Hospital:
In hours: acute oncology: 01935386551
Out of hours: Cancer helpline number : 01823 342436

Musgrove Park Hospital: Acute Haemato-Oncology Team	Bleep 3606
Out of hours: Cancer helpline number:	01823 342436
Dr Joanne Botten Associate Specialist and clinical lead for acute oncology	Ext 4259
Haematology Clinical Nurse Specialists	Bleep 4112
Ward 9	Ext. 2009
Beacon ward	Ext 4202
Haematology / Oncology Day Unit	Ext. 2296

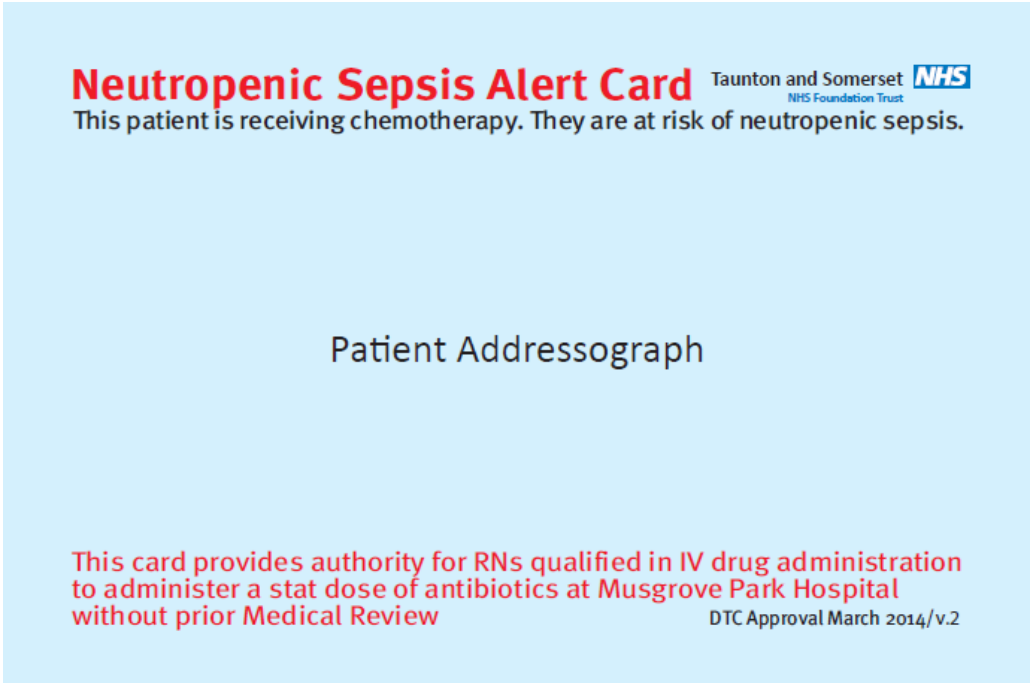
Out of hours – please page the on-call Haematologist or Oncologist via switchboard

Dr Robert Baker
Consultant Microbiologist Ext. 2632

Out of hours – please contact the on-call microbiologist via switchboard

NEW Coordinator (Critical Care Outreach) Bleep 2226

NEUTROPENIC SEPSIS ALERT CARD(TAUNTON)



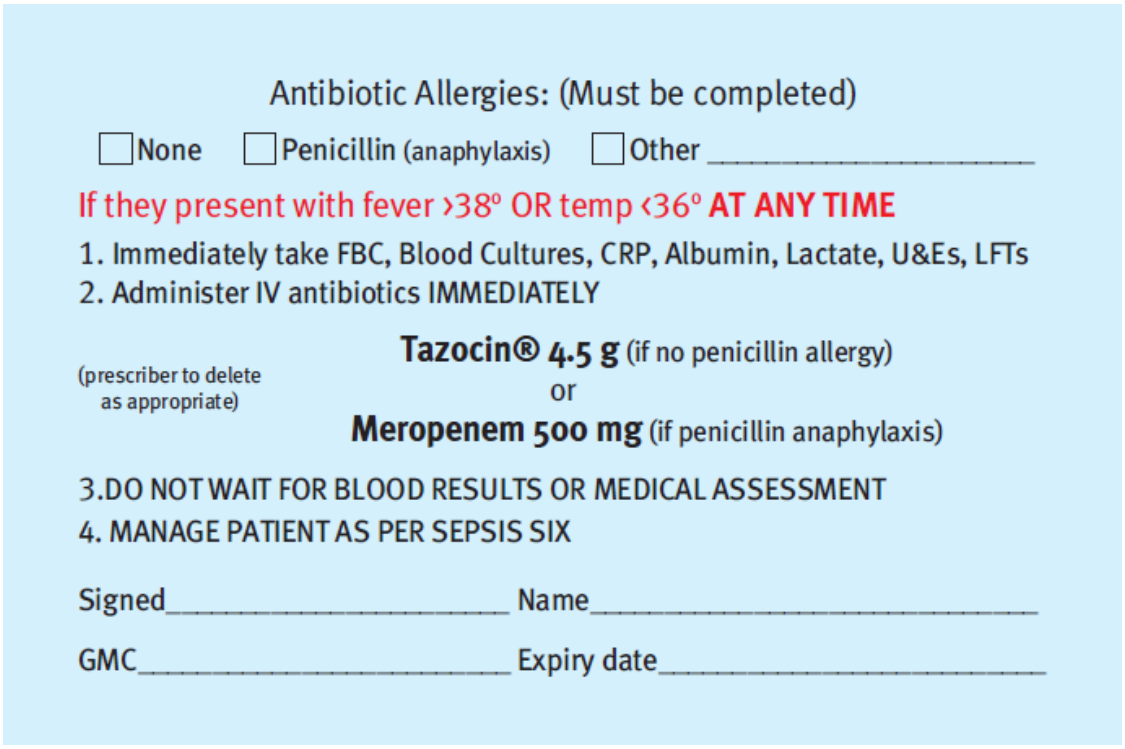
Neutropenic Sepsis Alert Card Taunton and Somerset NHS NHS Foundation Trust

This patient is receiving chemotherapy. They are at risk of neutropenic sepsis.

Patient Addressograph

This card provides authority for RNs qualified in IV drug administration to administer a stat dose of antibiotics at Musgrove Park Hospital without prior Medical Review

DTC Approval March 2014/v.2



Antibiotic Allergies: (Must be completed)

☐ None ☐ Penicillin (anaphylaxis) ☐ Other _____

If they present with fever >38° OR temp <36° **AT ANY TIME**

1. Immediately take FBC, Blood Cultures, CRP, Albumin, Lactate, U&Es, LFTs
2. Administer IV antibiotics IMMEDIATELY

(prescriber to delete as appropriate)

Tazocin® 4.5 g (if no penicillin allergy)

or

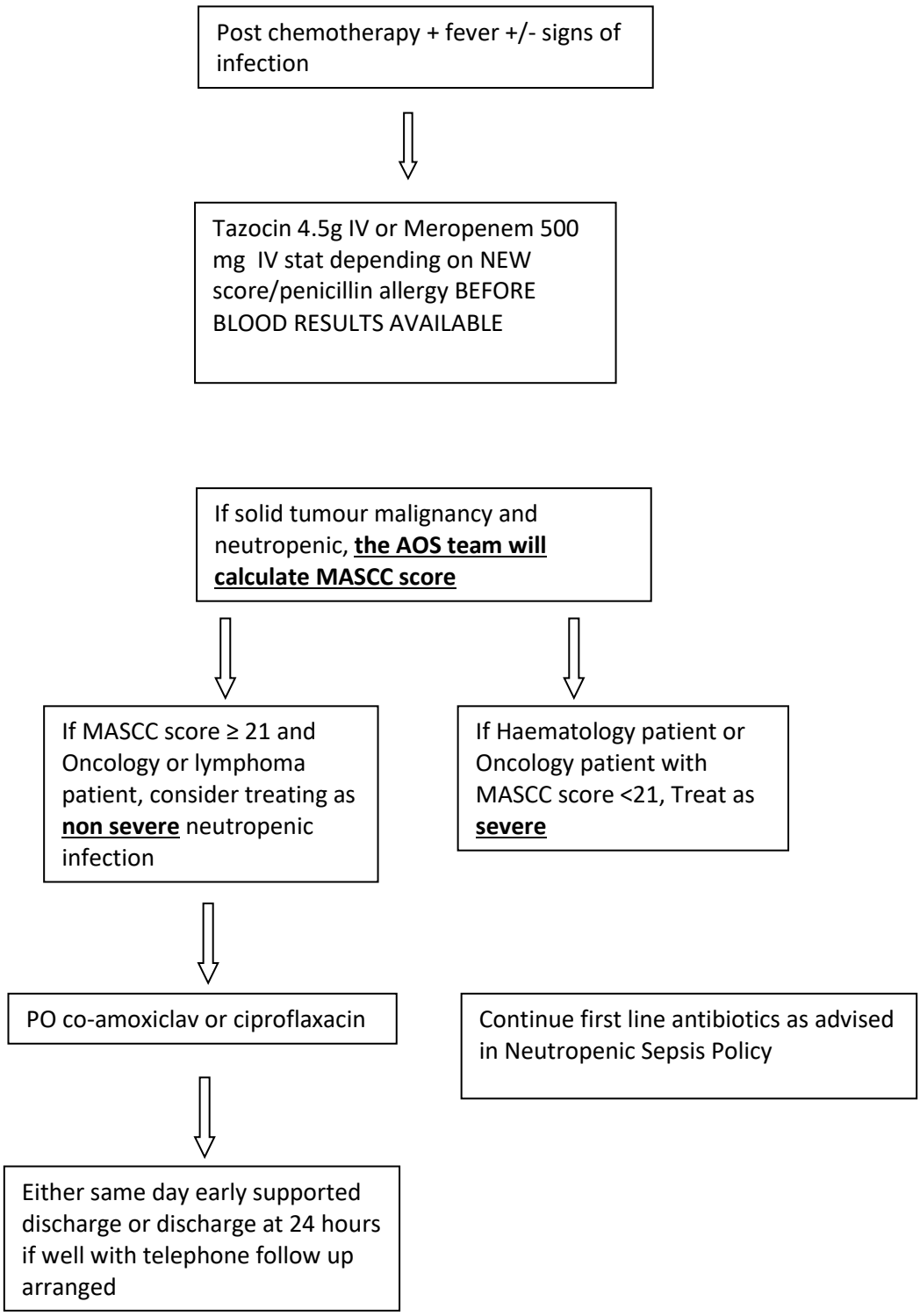
Meropenem 500 mg (if penicillin anaphylaxis)

3. DO NOT WAIT FOR BLOOD RESULTS OR MEDICAL ASSESSMENT
4. MANAGE PATIENT AS PER SEPSIS SIX

Signed_____ Name_____

GMC_____ Expiry date_____

FLOW CHART


Post chemotherapy + fever +/- signs of infection
Tazocin 4.5g IV or Meropenem 500 mg IV stat depending on NEW score/penicillin allergy BEFORE BLOOD RESULTS AVAILABLE
If solid tumour malignancy and neutropenic, the AOS team will calculate MASCC score
If MASCC score ≥ 21 and Oncology or lymphoma patient, consider treating as non severe neutropenic infection
If Haematology patient or Oncology patient with MASCC score <21, Treat as severe
PO co-amoxiclav or ciproflaxacin
Continue first line antibiotics as advised in Neutropenic Sepsis Policy
Either same day early supported discharge or discharge at 24 hours if well with telephone follow up arranged

FLOW CHART FOR IN-PATIENTS AT ST MARGARET HOSPICE (TAUNTON)