Decision Tree for Febrile Neutropenia: Medical Oncology Solid Tumour and Lymphoma Patients

Defined as Temperature greater than or equal to 38 degrees and Absolute Neutrophil Count less than 0.5 or less than 1 and expected to decrease to less than 0.5

Initial Evaluation

Low Risk (Appendix 1)

- Ciprofloxacin 750 mg PO q 12 h + Amoxicillin-Clavulanate 500 mg PO q 8 h.
  If penicillin allergy, ciprofloxacin 750 mg PO q 12 h as monotherapy.
  (Appendix 2)

- Ceftazidime 1 g IV q 8 h +/- vancomycin (for increased gram-positive coverage) or Piperacillin/Tazobactam 4.5 g IV q 6 h or imipenem-cilastatin 500 mg IV q 6 h. Initiate vancomycin under the conditions outlined in Appendix 2

High Risk

- Ciprofloxacin 400 mg IV q 12 h + Vancomycin 1 g IV q 12 h (this regimen not recommended if receiving prophylactic fluoroquinolone. Choose alternative gram-negative coverage) (Appendix 2)

Reassess after 72 hours, or sooner if indicated, based on C&S and clinical S&S (Appendix 3)

Afebrile for greater than or equal to 48 hours

- ANC greater than or equal to 0.5 x 10^9 cells/L for greater than or equal to 48 hours
  - Discontinue antibiotics if clinically well, no focus of infection and cultures negative. Monitor, reassess.

- ANC less than 0.5 x 10^9 cells/L
  - Initially low risk
    - Discontinue antibiotics when afebrile 5 to 7 days if no complications. Monitor, reassess.
  - Initially high risk
    - Continue antibiotics until ANC greater than or equal to 0.5 x 10^9 cells/L or for 2 weeks total therapy. Monitor, reassess.

Febrile

- ANC greater than or equal to 0.5 x 10^9 cells/L for greater than or equal to 5 days
  - Discontinue antibiotics if clinically well, no focus of infection and cultures negative. Monitor, reassess.

- ANC less than 0.5 x 10^9 cells/L
  - Reassess (Appendix 3)
    - Condition worsens, and new focus identified
      - Change antibiotics per C&S/SS while also maintaining gram-negative coverage
      - Monitor, reassess
    - Condition worsens and no new focus identified
      - Consult Infectious Diseases Service if available or transfer to closest tertiary facility. May consider empiric antifungal if still febrile after 4 days.

http://www.lhsc.on.ca/priv/sepsis/campaign.htm

DISCLAIMER

The London Health Sciences Centre (LHSC) and London Regional Cancer Program (LRCP) developed these guidelines for the purpose of assisting medical practitioners in the treatment of febrile neutropenic patients undergoing cancer chemotherapy. They apply only to solid tumours and lymphoma. They apply to inpatient management only.

These guidelines are general and the application must consider the variations in individual patients, types of infections being treated, antimicrobial susceptibility patterns, underlying causes of neutropenia, and expected time to recovery. It must be noted that no specific scheme, no specific drug or combination, and no specific period of treatment can be applied unequivocally to all patients with neutropenia and fever. LHSC will not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information in this document.
Appendix 1

Factors Favoring Low-Risk for Severe Infection in Febrile Neutropenia in Patient with Solid Tumors (non-hematological malignancies)

- Adjuvant Treatment
- Expected duration neutropenia of less than 7 days
- ANC greater than or equal to 1
- Non hematologic cancer
- No prior infection
- No obvious focus of infection
- No hypotension
- No confusion
- No diarrhea or vomiting
- Grade 2 mucositis or less
- Compliant (needs to come in if diarrhea or vomiting or can’t take oral meds)
- Normal organ function (renal, hepatic, pulmonary, cardiac)
- No diabetes
- Does not live alone (friend or family member at home until neutropenia resolved)
- Access to medical care (less than 1 hour) and initial daily medical outpatient
- Follow-up especially re culture results

Appendix 2

Antibiotics requiring dose Adjustments in Patients with Renal Dysfunction

- Cefazidine
- Vancomycin
- Ciprofloxacin
- Amoxicillin/Clavulanate
- Piperacillin/Tazobactam
- Imipenem-cilastatin

Appendix 3

Vancomycin Use

There are some instances when Vancomycin should be initiated immediately. These are:

- Hemodynamic instability or other evidence of severe sepsis
- Pneumonia documented radiographically
- Positive blood culture for gram-positive bacteria, before final identification and susceptibility testing is available
- Clinically suspected serious catheter related infection (e.g. chills or rigors with infusion through catheter and cellulitis around the catheter entry/exit site)
- Skin or soft-tissue infection at any site
- Colonization with MRSA or cephalosporin-resistant Streptococcus pneumonia
- Severe mucositis, if fluoroquinolone prophylaxis has been given and Cefazidine is employed as empirical therapy
### Antibiotic Therapy in Febrile Neutropenia

#### Preprinted Orders

**Key:**
- R - Requisitioned
- P - Processed (Kardex)

**Preparer's Printed Name / Signature / Contact #:**

**Processor Initials:**

**Date:**

**Time:**

**Reason for Exam / Clinical History and Contact # required for all Radiology / Nuclear Medicine orders.**

**Admit under CTU, Dr. ______________________________**

**Bloodwork**

- CBC, diff, Urea, Electrolytes, Creatinine - daily x 3.
- Group and reserve.
- Tobramycin levels pre and post 3rd dose.
  - (4th dose if 3rd dose is between 2200 hours and 0600 hours).

**Other:**

- **Cultures**
  - Before starting antibiotics draw blood cultures - peripheral and central from Port, or peripheral and from both Hickman lumens.

- Urine C & S.
- I & O.
- DAT.
- AAT.
- Reculture central line only q 48 h if febrile.

**I.V.**

- **D5W / 45% NaCl + ______ mmol KCl/L at ______ mL/h (150% maintenance).**

**If No Penicillin Allergy, start:**

- **Piperacillin ______ mg stat then q 6 h I.V.**
  - (usual dose 75 mg/kg/dose, maximum 4.0 gm)

- **Tobramycin ______ mg stat then q 8 h I.V.**
  - (usual dose 2.5 mg/kg/dose, maximum 100 mg)

- **Nystatin 300,000 units p.o. q.i.d., swish and swallow.**

- **Chlorhexidine 0.12% 5 mL q.i.d. swish and spit.**

- **Acetaminophen ______ mg p.o. q 4 h p.r.n.**
  - temp. > 38.5°C p.o. or 38°C axillary
  - (usual dose 10 - 15 mg/kg/dose).