## ADDENDUM 1

### Antimicrobial Dosing Guide for Febrile Neutropenia

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Dose</th>
<th>Dosing Interval</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefepime</td>
<td>50 mg/kg/dose</td>
<td>Every 8 hours</td>
<td>• Max dose = 2000 mg</td>
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<td></td>
<td>• Max dose = 1000 mg</td>
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<td></td>
<td>• Default infusion time = 1 hour, if history of Red Man syndrome</td>
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<td>consider change to 2 hour infusion</td>
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<td>• Consider consultation with pharmacy to determine previous dosing</td>
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<td></td>
<td></td>
<td>regimen that provided therapeutic serum drug concentrations</td>
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<tr>
<td>Vancomycin</td>
<td>15 mg/kg/dose</td>
<td>Every 6 hours</td>
<td>• Max dose = 1000 mg</td>
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<td></td>
<td>regimen that provided therapeutic serum drug concentrations</td>
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<tr>
<td>Tobramycin</td>
<td>7.5 mg/kg/dose</td>
<td>Every 24 hours</td>
<td>• No max dose</td>
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<td></td>
<td>• Dose based on Ideal Body Weight or Adjusted Body Weight (if Actual</td>
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<td>Body Weight 30% greater than Ideal Body Weight)</td>
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<td>• Consider consultation with pharmacy to determine previous dosing</td>
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<td></td>
<td></td>
<td>regimen that provided therapeutic serum drug concentrations</td>
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<tr>
<td>Metronidazole</td>
<td>10 mg/kg/dose</td>
<td>Every 8 hours</td>
<td>• Max dose = 500 mg</td>
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<tr>
<td>Aztreonam</td>
<td>50 mg/kg/dose</td>
<td>Every 6 hours</td>
<td>• Max dose = 2000 mg</td>
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<tr>
<td>Meropenem</td>
<td>20-40 mg/kg/dose</td>
<td>Every 8 hours</td>
<td>• Max dose = 2000 mg</td>
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<tr>
<td>Micafungin</td>
<td>Weight &lt; 25 kg: 4.5</td>
<td>Every 24 hours</td>
<td>• Max dose = 100 mg</td>
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<td></td>
<td>mg/kg/dose</td>
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<td>Weight ≥ 25 kg: 3</td>
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<td>mg/kg/dose</td>
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<tr>
<td>Liposomal Amphotericin</td>
<td>5 mg/kg/dose</td>
<td>Every 24 hours</td>
<td>• No max dose</td>
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<td>• Round dose to nearest 50 mg</td>
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<td>• To decrease the incidence of infusion reaction consider pre-</td>
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<td></td>
<td>medications, must be given exactly 30 minutes prior to infusion</td>
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<td></td>
<td>• Tylenol per protocol (PO)</td>
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<td></td>
<td>• Diphenhydramine 1 mg/kg (max 50 mg/dose, IV/PO)</td>
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<td>• Hydrocortisone 1 mg/kg (max 100 mg/dose, IV) (optional)</td>
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<td>• To decrease the risk of nephrotoxicity consider sodium loading</td>
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<td>with normal saline bolus or continuous infusion</td>
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ADDENDUM 2
Oncology Outpatient Management for Low Risk Febrile Neutropenia
Policy for Early Discharge Home on Oral Antibiotic Therapy
Dell Children’s Medical Center of Central Texas
Children’s Blood and Cancer Center

The following are guidelines for outpatient management of patients with low risk fever and neutropenia. They are intended to provide consistency within our practice, and not to replace good clinical judgment.

Children admitted to Dell Children’s Medical Center with febrile neutropenia can be risk stratified into low and high risk of developing bacteremia and/or adverse events based on published literature and clinical experience. Patients meeting criteria for Low Risk may be considered for early discharge on oral antibiotics to continue empiric treatment for febrile neutropenia.

Definitions:
- **Neutropenia**: absolute neutrophil count (ANC) less than 500/mm$^3$ or expected decline to less than 500/mm$^3$ in 48 hours as determined by the treating oncologist.
- **Fever**: single oral or axillary temperature greater than 38.3°C (101°F) or two temperatures greater than 38.0°C (100.4°F) in a one hour period.
- **Early discharge**: For qualifying Low-Risk patients, discharge can occur as early as 36 hours after admission.
- **Recurrent fever**: single oral or axillary temperature ≥ 38.0°C (100.4°F).
- **Bone marrow recovery**: at least two consecutive increasing ANC values and last ANC > 100/mm$^3$.

Eligibility:

**Inclusion**:
1. Family must live within 1 hour radius of DCMC.
2. Family is reliable and will call for recurrent fever, worsening condition, or with any concerns.
3. Family has telephone access.
4. Family has adequate transportation to return to clinic for appointments and for any new fever.
5. Age ≥ 1 year.
6. Afebrile ≥ 24 hours.
7. Negative blood cultures for at least 36-48 hours.
8. Able to take oral antibiotics.
9. Well-appearing (i.e. normal vital signs for at least 12 hour prior to discharge).

**Exclusion**:
1. Age < 1 year.
2. Diagnosis of Trisomy 21.
3. AML.
4. Infant ALL.
5. ALL in Induction or not yet in remission.
6. ALL relapse (any time prior to maintenance therapy).
8. BMT.
9. Intensive chemotherapy regimens likely to cause prolonged neutropenia (i.e. neutropenia >7-10 days).
10. Any hemodynamic instability at presentation requiring interventions (i.e. fluid resuscitation, inotropes).

11. New onset abdominal pain, mucositis (requiring IV narcotics), or perirectal/other soft tissue abscess.
12. Evidence of respiratory changes at presentation (i.e. hypoxia, distress, compromise, pneumonitis).
13. Altered mental status, neurological changes, or irritability/meningism.
14. Not tolerating oral (including oral medications).
15. Evidence of focal infection (bacteremia, pneumonia, cellulitis, typhlitis, etc.).
16. History of ICU admission with prior febrile neutropenia episode.
17. Readmission after discharge as “Low Risk” patient.
18. Non-adherence and/or social concerns.

**Antibiotic Guidelines:**
If a child meets eligibility for early discharge, they may be discharged on one of the following antibiotics. The selection of home antibiotics may depend on insurance coverage. Recommend initiation of oral antibiotics prior to discharge so that patient takes at least one dose prior to discharge to demonstrate tolerability.

Antibiotics should be continued until evidence of bone marrow recovery.

1. Preferred: ciprofloxacin,
   - 10mg/kg/dose (max dose 750mg) PO BID.
   - Oral suspension cannot be given via feeding tubes because the suspension is oil-based and adheres to the feeding tube; however the tablets can be crushed and safely given via feeding tubes.
   - Available dosage forms
     - Tablets: 100mg, 250mg, 500mg, 750mg.
     - Oral suspension: 250mg/5mL (100mL), 500mg/5mL (100mL)
2. Alternative: levofloxacin,
   - <5 years old: 10mg/kg/dose (max dose 750mg) PO BID.
   - ≥5 years old: 10mg/kg/dose (max dose 750mg) PO Qday.
   - Both oral solution and tablets can be safely given via feeding tubes.
   - Available dosage forms
     - Tablets: 250mg, 500mg, 750mg.
     - Oral solution: 25mg/mL (10mL, 20mL, 100mL, 200mL, 480mL)

**Follow-up Instructions:**
Close follow up is required for any child discharged home early on oral antibiotics. Remember, these are patients who did not have evidence of bone marrow recovery at discharge. This close follow up will be discontinued once there is evidence of bone marrow recovery.

1. The patient should have daily telephone or clinic follow-up.
   a. Twice per week follow up should be planned in the oncology clinic (with labs/exam)
   b. Remaining 5 days should include phone follow-up
   c. Phone follow up on weekdays will include call by clinic nurse during the weekday. Weekend phone follow up with be from the on-call NP. Calls should be made prior to 2pm these days.

**Home Instructions for Parents:**
1. Parent information sheet including guidelines for when they should call, antibiotic administration guidelines, and required outpatient follow up, and instructions for home temperature checks.
a. Family to be given thermometer at discharge
b. Family to check temperature 2-3 times per day at home and any time they suspect a temperature.
c. If patient has a fever they will return immediately to CBCC outpatient clinic or ER for DCMC readmission.

Discharge checklist:
All of the following must occur prior to discharge:

- Patient and family must meet eligibility criteria.
- Family has home antibiotics in hand prior to discharge. It is preferred to have the antibiotics filled at Seton Central Outpatient Pharmacy (SCOP).
- Parent information sheet must be given to family and reviewed with them.
- Documentation by the provider in the medical record that the parent information sheet was given and reviewed, that patient meets eligibility criteria, and antibiotics have been given to family.
- First follow-up appointment must be scheduled and entered in patient’s depart plan.
- Email must be sent to hemeonc.signout informing nursing and clinic staff of patient’s discharge and plan for close outpatient follow up.

Guidelines for readmission:
1. Recurrent fever
2. New exam findings for focal infection
3. Not tolerating or not adherent to oral antibiotics
4. Respiratory distress
5. Non-adherence to phone or clinic follow-up
6. Blood culture turns positive
7. Physician concern

References:
ADDENDUM 3

Low Risk Fever Neutropenia Oncology Patient Discharge Information

IMPORTANT PHONE NUMBERS OF YOUR HEALTH CARE TEAM:
Children’s Blood and Cancer Center: 512-628-1900
(Monday – Friday 7am-5:30pm)
Medlink answering service: 512-323-5465 (ask for on-call pediatric oncologist)
(Nights/Weekends/Holidays)

Prior to discharge: you are required to have:
- A thermometer for home use
- Antibiotic prescription in hand
- Adequate transportation to return to CBCC for follow up or DCMC for admission
- Working phone number to receive daily calls from the CBCC nurse or nurse practitioner
- Follow up appointment scheduled with CBCC

Instructions for home
- Check temperature 2-3 times a day AND any time you suspect a fever
  Notify your oncology team if temperature is 100.4 or higher
- Follow up with your oncology team at the CBCC at least twice a week until lab counts recover
  Next follow up appointment: ________________
- Plan to stay within a one hour driving distance from DCMC
- You will return immediately to CBCC outpatient clinic or DCMC ER for readmission if fever returns before counts have improved

Antibiotic Instructions
- Give Ciprofloxacin _____mg____times a day
- Give Levofloxacin _____mg_____times a day
- Give _______________________________
- Do NOT stop taking your antibiotics until instructed by your oncology team
- Take antibiotics on an empty stomach
- Oral magnesium and antacids should not be given within two hours of oral antibiotics

CALL YOUR HEALTH CARE TEAM RIGHT AWAY IF YOUR CHILD HAS:
- Fever of 100.4 or higher—do not give Tylenol until doctor instructs you to. Do NOT give Motrin.
- Other signs of infection such as pain, redness or swelling anywhere in the body (sore throat, ear ache, stiff neck, pain when urinating or having bowel movements, pain or redness at broviac or port-a-cath site), or chills.
- Bleeding, including a nose bleed, bleeding from the gums that does not stop with 5-10 minutes of gentle pressure, blood in urine or stool, vomit or stool that looks black, easy bruising, or tiny red, freckles on the skin.
- Difficulty breathing
- A change in behavior or level of consciousness. Being very sleepy and being very irritable, or not making sense while talking.
- Sudden change in vision or severe headache
- Vomiting or diarrhea three times in 24 hours, or not being able to eat or drink.
- Problems with central line
- Severe mucositis (mouth sores), or is unable to eat or drink.

The doctor may instruct you to go to the emergency room at Dell Children’s Medical Center or to the CBCC. If you go to the ER, wear a mask and tell the ER nurse and doctor the above information. Make sure they know your child cannot have a urinary catheter, rectal temperatures, enemas or suppositories. If your child has a fever, the team should begin your child on antibiotics as soon as possible.

Parent signature_________________________________ Nurse Signature ___________________________