I. **Purpose:** BMT patients are at risk for infections in the post-transplant period.

II. **Scope:** This guideline outlines the routine infection prophylaxis for at risk patients.

III. **Guideline:**

<table>
<thead>
<tr>
<th>Phase I, Pre-engraftment, &lt;30 days</th>
<th>Phase II, Post-engraftment, 30-100 days</th>
<th>Phase III, Late phase, &gt;100 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutropenia, mucositis and acute GVHD</td>
<td>Impaired cellular immunity and acute and chronic GVHD</td>
<td>Impaired cellular and humoral immunity and chronic GVHD</td>
</tr>
</tbody>
</table>

**Reactivation**
- Herpes Simplex Virus
- Cytomegalovirus
- BK Virus
- Epstein-Barr Virus Lymphoproliferative Disease
- HHV-6
- HHV-7
- Varicella-Zoster Virus

**Community Acquired**
- HHV-6
- Parvo B-19
- Respiratory and Enteric Viruses

**Environmentally Acquired**
- Facultative Gram- Bacilli
- GI Tract Streptococci Species
- Staphylococcus Epidermidis
- Encapsulated Bacteria (e.g. pneumococcus)
- All Candida Species
- Aspergillus Species
- Pneumocystis Carinii
- Toxoplasma Gondii

*Primarily among persons who are seropositive before transplant.*
## Table 1. Prevention of PJP and Toxoplasma

<table>
<thead>
<tr>
<th>Indication</th>
<th>First choice</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>All allogeneic and autologous patients</td>
<td>Adult, PJP only: TMP-SMX 1 DS tab PO BID, 2 days per week (i.e., M &amp; Th)</td>
<td>Preferred alternative for PCP prophylaxis AND IgG Positive for Toxoplasma: Adult: Atovaquone (Mepron) 1500 mg PO daily – take with food. Pediatric: Atovaquone – take with food 1-3 mo or &gt;24 mo: 30 mg/kg/day PO Daily; 4-24 mo: 45 mg/kg/day (max: 1500 mg/dose)</td>
</tr>
<tr>
<td>Time:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start once ANC &gt;1,000 and PLT &gt;50,000 but no earlier than day 30.</td>
<td>Adult, PJP and Toxoplasma IgG positive: TMP-SMX 1 DS tab PO BID, 3 x/week</td>
<td></td>
</tr>
<tr>
<td>Duration (Allo):</td>
<td>Peds:</td>
<td></td>
</tr>
<tr>
<td>Stop at 6mo or until off IS^</td>
<td>TMP-SMX 2.5 mg/kg TMP PO BID, 2 days per week (max: 160 mg TMP/dose)</td>
<td></td>
</tr>
<tr>
<td>Duration (Auto):</td>
<td>3-6 months</td>
<td></td>
</tr>
</tbody>
</table>

*All candidates for allogeneic HSCT recipients should have a screening Toxoplasma IgG prior to transplantation.

^Patients with GvHD should be restarted or continue to receive PJP/Toxoplasma prophylaxis

**TMP-SMX** : Trimethoprim-sulfamethoxazole (Bactrim)

DS tab: double strength tablet (Trimethoprim 160 mg-sulfamethoxazole 800 mg)

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**Alternative for PCP prophylaxis AND IgG Negative for Toxoplasma:**

**Adult:** Pentamidine 300 mg inh once monthly OR Pentamidine 4 mg/kg IV once monthly (if unable to tolerate inhaled; dosed using actual body weight)

**Pediatric:**

<5 years:

Pentamidine 9 mg/kg inh once monthly (max: 300 mg) OR Pentamidine 4 mg/kg IV once monthly (if unable to tolerate inhaled; dosed using actual body weight)

≥5 years:

Pentamidine 300 mg inh once monthly OR Pentamidine 4 mg/kg IV once monthly (if unable to tolerate inhaled; dosed using actual body weight)

**Alternative for PJP prophylaxis AND IgG Negative for Toxoplasma:**

**Adult:** Dapsone 100 mg PO daily (G6PD screening recommended for all patients; contraindicated in patients with hypersensitivity to sulfa)

**Pediatric:**

Dapsone 2 mg/kg/dose PO daily (max: 100 mg/dose) (G6PD screening recommended for all patients; contraindicated in patients with hypersensitivity to sulfa)

*Be aware of increased risk of methemoglobinemia
### Table 2. Prevention of Fungal (Yeast and Mold) Infections

<table>
<thead>
<tr>
<th>Indication</th>
<th>First Choice</th>
<th>Alternative</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All patients (except cord, haplo, or mismatched)</strong>&lt;br&gt;<strong>Starting on admission</strong>&lt;br&gt;Adults:&lt;br&gt;<strong>Fluconazole</strong> 200 mg PO/IV Daily&lt;br&gt;Pediatric:&lt;br&gt;<strong>Fluconazole</strong> 3 mg/kg PO/IV Daily (max: 200 mg)</td>
<td>If AST/ALT/T. Bili &gt;3x ULN or otherwise deemed clinically significant, consider:&lt;br&gt;Adults:&lt;br&gt;Micafungin 50 mg IV q24h&lt;br&gt;Pediatric:&lt;br&gt;Micafungin 3-4 mg/kg IV q24h (max: 50 mg)</td>
<td><strong>Auto:</strong> Until ANC &gt;1000 x 3 days&lt;br&gt;<strong>Allo:</strong> Until day +100, off immunosuppression or on broader antifungal</td>
<td><strong>Scenario 1:</strong>&lt;br&gt;Continue until day +100 or on broader fungal coverage&lt;br&gt;Note: If still on immunosuppression when mold-active agent discontinued, will switch to Fluconazole (same dosing as above) until off immunosuppression. <strong>Scenario 2:</strong> Until ANC &gt;1000 x 3 days</td>
</tr>
<tr>
<td><strong>Scenario 1:</strong>&lt;br&gt;All cord, haplo, mismatched transplant recipients or ATG, thymoglobulin, and alemtuzumab conditioning regimens&lt;br&gt;<strong>Starting on admission</strong>&lt;br&gt;Adults:&lt;br&gt;<strong>Micafungin</strong> 100 mg IV q24h, then&lt;br&gt;<strong>Voriconazole</strong> 200 mg PO/IV* BID starting day +5-10a&lt;br&gt;Pediatric:&lt;br&gt;<strong>Micafungin</strong> 5 mg/kg IV q24h, then&lt;br&gt;<strong>Voriconazole</strong> 8 mg/kg PO/IV* BID (TID if ≤8 years old) starting day +5-10 a</td>
<td>If intolerance to voriconazole** OR insurance does not cover voriconazole:&lt;br&gt;Adults:&lt;br&gt;<strong>Posaconazole</strong> delayed-release tabs 300 mg PO/IV* daily&lt;br&gt;Pediatric:&lt;br&gt;<strong>Posaconazole</strong> delayed-release tabs: &lt;40 kg: 100 mg PO BID; 40-60 kg: 200 mg BID; &gt;60 kg: 300 mg BID</td>
<td>Isavuconazole is not recommended at this time due to reports of breakthrough infection. May be considered if &gt;15 years AND &gt;50 kg AND either QTc&gt;500, hepatotoxicity to vori/posa, or insurance does not cover vori/posa:&lt;br&gt;<strong>Isavuconazole</strong> 372 mg PO/IV* daily&lt;br&gt;Sickle Cell Pts: avoid voriconazole</td>
<td><strong>Scenario 1:</strong>&lt;br&gt;Isavuconazole is not recommended at this time due to reports of breakthrough infection. May be considered if &gt;15 y/o AND &gt;50 kg AND either QTc&gt;500, hepatotoxicity to vori/posa, or insurance does not cover vori/posa:&lt;br&gt;<strong>Isavuconazole</strong> 372 mg PO/IV* daily</td>
</tr>
<tr>
<td><strong>Scenario 2:</strong>&lt;br&gt;Patients with prolonged neutropenia (≥30 days) entering transplant&lt;br&gt;<strong>Starting on admission</strong>&lt;br&gt;Adults:&lt;br&gt;<strong>Voriconazole</strong> 200 mg PO/IV* BID&lt;br&gt;Pediatric:&lt;br&gt;<strong>Voriconazole</strong> 8 mg/kg PO/IV* BID (TID if ≤8 years old)</td>
<td>If concern for liver GvHD (AST/ALT/T. Bili &gt;3x ULN):&lt;br&gt;Adults:&lt;br&gt;Micafungin 100 mg IV q24h&lt;br&gt;Pediatric:&lt;br&gt;Micafungin 5 mg/kg IV q24h (max: 100 mg)</td>
<td><strong>Discontinue when off additional GvHD-related immunosuppression (or &lt;10 mg/day prednisone (adults) or 0.15 mg/kg/day (pediatric) for &gt;30 days).</strong>&lt;br&gt;See footnote^ for prophylaxis duration after other GvHD-related immunsuppression.</td>
<td><strong>Scenario 2:</strong>&lt;br&gt;Isavuconazole is not recommended at this time due to reports of breakthrough infection. May be considered if &gt;15 y/o AND &gt;50 kg AND either QTc&gt;500, hepatotoxicity to vori/posa, or insurance does not cover vori/posa:&lt;br&gt;<strong>Isavuconazole</strong> 372 mg PO/IV* daily</td>
</tr>
<tr>
<td><strong>Allogeneic patients with GvHD or engraftment syndrome receiving additional immunosuppression (systemic steroids ≥0.25 mg/kg, infliximab, ruxolitinib, etc.)</strong></td>
<td>If intolerance to voriconazole** OR insurance does not cover voriconazole:&lt;br&gt;Adults:&lt;br&gt;<strong>Posaconazole</strong> delayed-release tabs 300 mg PO/IV* daily&lt;br&gt;Pediatric:&lt;br&gt;<strong>Posaconazole</strong> delayed-release tabs: &lt;40 kg: 100 mg PO BID; 40-60 kg: 200 mg BID; &gt;60 kg: 300 mg BID</td>
<td><strong>Discontinue when off additional GvHD-related immunosuppression (or &lt;10 mg/day prednisone (adults) or 0.15 mg/kg/day (pediatric) for &gt;30 days).</strong>&lt;br&gt;See footnote^ for prophylaxis duration after other GvHD-related immunosuppression.</td>
<td><strong>Scenario 2:</strong>&lt;br&gt;Isavuconazole is not recommended at this time due to reports of breakthrough infection. May be considered if &gt;15 y/o AND &gt;50 kg AND either QTc&gt;500, hepatotoxicity to vori/posa, or insurance does not cover vori/posa:&lt;br&gt;<strong>Isavuconazole</strong> 372 mg PO/IV* daily</td>
</tr>
</tbody>
</table>

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**Trough levels of voriconazole, isavuconazole, and posaconazole should be drawn after 5-7 days. Refer to guideline on therapeutic drug monitoring of antifungal agents**<br>^Alemtuzumab and Anti-thymocyte globulin (6 months); Infliximab, Tocilizumab, Etanercept, Adalimumab, Basiliximab, Vedolizumab (3 months) ECP, Ruxolitinib (1 month)

***Intolerance to voriconazole is defined as presence of visual hallucinations despite normal levels or hepatotoxicity attributed to voriconazole**

*IV azole preferred over micafungin in high risk patients who are NPO with an expected duration of treatment >5 days. Change to PO azole when appropriate.*
<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Indications</th>
<th>First choice</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial prophylaxis</td>
<td>All Autologous and Allogeneic transplant recipients starting D+1</td>
<td>Adult: <strong>Levofloxacin</strong> 500 mg PO/IV daily</td>
<td>Pre-engraftment prophylaxis, continue until:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pediatric: &lt;5 years: <strong>Levofloxacin</strong> 10 mg/kg PO/IV BID (max: 375 mg/dose)</td>
<td>1. Fever and Neutropenia (i.e., broader antimicrobial such as cefepime, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥5 years: <strong>Levofloxacin</strong> 10 mg/kg PO/IV daily (max: 500 mg/dose)</td>
<td>2. Engraftment*</td>
</tr>
<tr>
<td></td>
<td>Patients to be started on levofloxacin as prophylaxis post-transplant for the following indications:</td>
<td>Alternative for FQ Allergy/Intolerance: Adult: <strong>Cefpodoxime</strong> 200 mg PO BID</td>
<td>GI GvHD: Continue until normal PO intake</td>
</tr>
<tr>
<td></td>
<td>1. Acute GvHD with GI involvement</td>
<td>Pediatric: <strong>Cefpodoxime</strong> 5 mg/kg PO BID (max: 200 mg/dose)</td>
<td>Pancytopenia: Until count recovery</td>
</tr>
<tr>
<td></td>
<td>2. Pancytopenia 2/2 graft failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encapsulated organisms</td>
<td>Recipients with chronic GvHD, s/p splenectomy, functionally asplenic, or sickle cell disease</td>
<td>Adults: <strong>Penicillin VK</strong> 500 mg PO BID</td>
<td>1. Off Immunosuppression for 1 month and asymptomatic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pediatric: ≥10 years: <strong>Penicillin VK</strong> 500 mg PO BID</td>
<td>2. <strong>Hold while on levofloxacin</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-10 years: <strong>Penicillin VK</strong> 250 mg PO BID</td>
<td>Lifelong if:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;3 years: <strong>Penicillin VK</strong> 125 mg PO BID</td>
<td>1. s/p splenectomy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternative (Penicillin allergy):</td>
<td>2. extensive cGvHD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adults: <strong>Azithromycin</strong> 250 mg PO daily OR <strong>TMP-SMX</strong> 1 DS PO daily</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peds: <strong>Azithromycin</strong> 5 mg/kg PO daily (max: 250 mg) OR <strong>TMP-SMX</strong> 2.5 mg TMP/kg BID, 2 days per week (max: 160 mg TMP/dose)</td>
<td></td>
</tr>
<tr>
<td>Immunoglobulin Supplementation</td>
<td>IgG &lt;400 mg/dL</td>
<td>IVIG 0.4 g/kg/dose based on ideal body wt</td>
<td>Monitor monthly until IgG &gt;400 for 2 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Absolute neutrophil count ≥1000/mm³ for 3 consecutive days
<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Indication</th>
<th>First Choice</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Herpes Simplex Virus (HSV)</strong></td>
<td>All seropositive recipients <em>(starting day 0)</em></td>
<td><strong>Adult:</strong> Acyclovir* 400 mg PO BID or 200 mg IV q12h  &lt;br&gt; <strong>Pediatric:</strong> &lt;br&gt; ≥6 years: Acyclovir* 400 mg PO BID or 200 mg IV q12h &lt;br&gt; &lt;6 years: Acyclovir* 200 mg PO BID</td>
<td>1. Stop day +30 if only HSV  &lt;br&gt; 2. Stop at 1-year if VZV+ and HSV+ (recipient)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternative (Acyclovir allergy) - Famciclovir  &lt;br&gt; <strong>Adults:</strong> Famciclovir 250 mg PO BID</td>
<td></td>
</tr>
<tr>
<td><strong>Cytomegalovirus (CMV)</strong></td>
<td>Monitoring</td>
<td>Weekly quantitative CMV plasma PCR  &lt;br&gt; Starting day +7 for patients meeting ‘additional risk factors’ identified below or with conditioning for high risk pediatric pts (i.e., intermediate or distal alemtuzumab)  OR  At day +21 for all patients less than 18 years and adults not meeting high-risk criteria below.</td>
<td>1. Off immunosuppression or minimal immunosuppression (low dose tacrol, etc.)</td>
</tr>
<tr>
<td><strong>Seropositive</strong></td>
<td>allogeneic recipient with additional risk factors:  &lt;br&gt; • Cord blood transplant recipient, Receipt of T-cell depleting agent (alemtuzumab, thymoglobulin, ATG), T-cell depleted stem cell sources (i.e., haploidentical transplants, in-vivo or ex-vivo depletion)  &lt;br&gt; • Letermovir starting Day +10</td>
<td><strong>Adult:</strong> Letermovir^ 480 mg PO/IV daily (240 mg daily with cyclosporine)  &lt;br&gt; <strong>CONTINUE ACYCLOVIR WHILE ON LETERMOVIR FOR HSV COVERAGE.</strong></td>
<td>1. Continue for 3 months after initiation  &lt;br&gt; 2. On broader antiviral <em>(ganciclovir, valganciclovir, foscarnet, full dose cidofovir)</em>  &lt;br&gt; 3. In patients who develop GvHD within 100 days, may consider extending duration to 3 months from GvHD diagnosis.</td>
</tr>
<tr>
<td></td>
<td><strong>Seropositive</strong> allogeneic recipient without additional risk factors:  &lt;br&gt; • Letermovir to start at Day 21/discharge unless additional immunosuppression added (i.e., engraftment syndrome, aGVHD, etc)</td>
<td><strong>All other uses of letermovir require approval by transplant infectious diseases.</strong>  &lt;br&gt; Letermovir is not approved for pediatric patients (&lt;18 years)</td>
<td></td>
</tr>
<tr>
<td><strong>Varicella-Zoster Virus (VZV)</strong></td>
<td>All recipients with a history of chickenpox, zoster, or positive serology, starting day +30</td>
<td>See above HSV section</td>
<td>1. Until +1 year and off immunosuppression</td>
</tr>
</tbody>
</table>

* (Val)Acyclovir/Famciclovir should be held if patient is on ganciclovir, valganciclovir, foscarnet or full dose cidofovir but should continue if patient is on Letermovir  <br> ^Letermovir should be held if patient is being treated for CMV (see flowchart); Letermovir should be stopped after 2 separate CMV reactivations (PCR >3000) requiring treatment.
**EBV Reactivation Screening Guidelines for Stem Cell Transplant Recipients**

- Guidelines to be followed for high risk patients only

**Screening Guidelines**

- Send quantitative EBV PCR every other week (plasma assay)
- Start testing on day +7 (adults) or with conditioning for high risk pediatric pts (i.e., recent alemtuzumab) and continue through D+100

** Reactivation Guidelines**

- **Consider** starting treatment with rituximab if EBV copy number >1000 IU/mL on 2 consecutive tests or if symptomatic (fever, lymphadenopathy)
- If copy number >1000 IU/mL
  - Consider CT of chest/abdomen/pelvis
  - Request EBV serostatus on the donor
  - Start **Rituximab** (dose for all patients = 375 mg/m\(^2\)); **additional doses should be given if EBV PCR remains positive 1 week after Rituximab is given (i.e., continue rituximab until PCR negative and asymptomatic)**
  - Recommend reduction in immunosuppression if clinical situation allows
  - Ganciclovir treatment is not recommended
- If EBV reactivation leads to PTLD
  - Continue **Rituximab** weekly with consideration for additional chemotherapeutic agents (CHOP based therapy)
  - If donor is seropositive, consideration should be given to donor lymphocyte infusion
  - CNS disease, consideration can be given to intrathecal **Rituximab** (Dose = 12-50 mg)
  - Recommend reduction in immunosuppression if clinical situation allows

**Treatment of Toxoplasmosis**

If a patient develops new CNS or new neurologic symptoms concerning for infection, recommend sending *Toxoplasma* PCR at that time. If PCR positive, treat as listed below.

<table>
<thead>
<tr>
<th>Indication</th>
<th>First Choice</th>
<th>Alternative for sulfa allergy</th>
</tr>
</thead>
</table>
| * Positive *Toxoplasma* quantitative plasma PCR | **Pyrimethamine** 200 mg PO loading dose then 75 mg PO daily  
  + **Sulfadiazine** 1 g PO QID  
  + **Leucovorin** 25 mg daily†  
  **Pediatric:**  
  **Pyrimethamine** 1 mg/kg/dose PO BID (max: 50 mg/dose) x2 days, then 1 mg/kg daily (max: 75 mg/dose)  
  + **Sulfadiazine** 50 mg/kg/dose PO QID (max: 1 g/dose)  
  + **leucovorin** 25 mg daily†  | **Pyrimethamine**  
  + **Leucovorin** as per first choice  
  + one of the following:  
    **Clindamycin** IV/PO 1,800 – 2,700 mg/day divided q6-8h  
    OR  
    **Dapsone** 100 mg PO daily  
    OR  
    **Azithromycin** 1,250 mg PO daily†  |

† Treat for minimum of 7 days after PCR has become negative
* Consider infectious disease consultation
IV. Diagnostic Testing Guidelines

a. In general, quantitative viral PCR testing (e.g., CMV) does not provide clinically useful information when repeated more frequently than weekly. In patients with low positive HHV-6 plasma PCR assays (<2500 copies/mL), more frequent repeat testing is indicated as a rising titer may result in earlier institution of treatment. In patients for whom viral monitoring is required, recommend serial testing on Mondays.

b. While case reports have demonstrated rare disease associated with HHV-7 (e.g., encephalitis), the significance of HHV-7 viremia (5%-57% of patients at least one-time point) is unknown. Measurement of HHV-7 for undifferentiated fever is unlikely to be clinically useful.

c. HHV-8 is primarily associated with Kaposi’s sarcoma (0.5% of post HSCT patients) and should not be measured routinely.

d. Limited studies on the use of quantitative PCR for CMV on stool have been conducted, the assay is not standardized, and clinical utility is unknown.

e. Weekly screening galactomannan levels in patients on prophylaxis with voriconazole, posaconazole, isavuconazole, or micafungin will not be sent. Symptom-based testing would be appropriate.

V. HHV-6 Guidelines

a. HHV-6 infection may result in encephalitis after allogeneic stem cell transplant and has been associated with delay engraftment, pneumonitis, fever and rash. Asymptomatic reactivation occurs in about 50% of patients. The following principles guide our approach to HHV-6.

   i. HHV-6 viremia should not be routinely monitored
   ii. In patients in which there is clinical suspicion for HHV-6 related disease (e.g., encephalitis early after transplant, delay engraftment, rash and fever without other explanation) a quantitative plasma PCR for HHV-6 should be obtained.
   iii. Treatment with foscarnet, ganciclovir (post-engraftment with adequate blood counts) or cidofovir should be considered if:
      1. Single value >5,000 copies/mL
      2. Doubling of HHV-6 PCR on serial measurement and >2500 copies/mL (serial measurement should be performed as soon as positive titer received)
      3. Transplant ID consultation recommended if treatment considered
      4. Patients at high risk for graft failure or delayed engraftment (cord blood transplants, low dose grafts, HLA mismatched grafts) may benefit most from treatment.

VI. Adenovirus Guidelines

a. Adenovirus infection may result in severe respiratory disease, hepatitis, and colitis after allogeneic stem cell transplant and disease has been associated with high rates of mortality. The incidence of adenovirus infections is higher in pediatric patients (20-26%) undergoing HSCT than in adults (9%). The following principles guide our approach to Adenovirus:

   i. Routine monitoring is not recommended in all other patients

b. Adenovirus serum PCR should be monitored weekly in high risk patients starting on day +7 (adults) or with conditioning for high risk pediatric pts (i.e., intermediate or distal alemtuzumab)

   i. Routine monitoring is not recommended in all other patients

c. In patients in which there is a clinical suspicion for adenovirus related disease (e.g., severe diarrhea or pneumonia, delayed engraftment, etc.) or RPAN or GI PCR positive for adenovirus, a quantitative plasma PCR for adenovirus should be obtained.

   i. Note: RPAN and GI PCR test for different subtypes of adenovirus and may produce discordant results

d. Treatment should be considered if:
i. Single positive PCR value or doubling of adenovirus PCR on serial measurements
ii. Diarrhea with GI PCR positive for adenovirus in the absence of alternative etiology
iii. Pneumonia with RPAN PCR positive for adenovirus in the absence of alternative etiology
e. Consultation to transplant ID is highly recommended to assist in treatment decision
f. Patients at high risk for graft failure or delayed engraftment (cord blood transplants, low dose grafts, HLA mismatched grafts) may benefit most from treatment.
g. Treatment:
   i. Adult: Cidofovir 5 mg/kg IV weekly x2 doses then every other week with prehydration and oral probenecid 2 g, 2 hours prior to cidofovir, and 1 g 1 & 4 hours after completion of cidofovir.
   ii. Pediatric: Cidofovir 5 mg/kg IV weekly x2 doses then every other week with prehydration and oral probenecid 30 mg/kg (min: 250 mg; max: 2 g) 2 hours prior to cidofovir dose and 15 mg/kg (min: 250 mg, max: 1 g) 1 & 4 hours after completion of cidofovir. OK to crush tablet and mix with food or water prior to administration if needed.

VII. References

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Twisha Patel, PharmD
Gregory Eschenauer, PharmD

Reviewers:
Bone Marrow Transplant
Transplant Infectious Diseases

Additional approvers:
CPC 2/2019
The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider's professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

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