

Office of Origin: Department of Hospital Epidemiology and Infection Prevention (HEIP)

I. PURPOSE

To minimize the risk of infection for immunocompromised patients. Patients with impaired immune systems are at higher risk for infection. Reducing the risk for infection combines strict attention to patient care practices in the inpatient environment and patient and visitor education.

II. REFERENCES

- A. [Infection Control Policy on Hand Hygiene](#)
- B. [Central Venous Catheter \(CVC\) Care and Maintenance \(Pediatric/Neonatal\)](#)
- C. [Infection Control Policy on Healthcare Workers with Infections](#)
- D. [Infection Control Construction Policy](#)
- E. [Facilities Management Building Services](#)

III. DEFINITIONS

- A. Absolute Neutrophil Count (ANC):
The measure of the number of neutrophil granulocytes (also known as polymorphonuclear cells, PMN's, polys, granulocytes, segmented neutrophils or segs) present in the blood. Neutrophils are a type of white blood cell that fights infection. The ANC is calculated from measurements of the total number of white blood cells (WBC), usually based on the combined percentage of mature neutrophils (sometimes called "segs," or segmented cells) and bands, which are immature neutrophils. $ANC = (\% \text{ neutrophils} + \% \text{ bands}) \times WBC$. The unit of ANC is cells per microliter (abbreviated μL ; a microliter is equal to one cubic millimeter) of blood. A normal ANC is 1,800 or more cells per microliter. An ANC less than 500 cells/ μL is defined as significant neutropenia and increases the risk of infection.
- B. Immunocompromised Patients:
See below for immunocompromised patient categories including low, moderate, high-risk, and strict precautions.
- C. Neutropenic Precautions:
Neutropenic Precautions only apply to adult patients with hematologic malignancies. These precautions are not used at BCH San Francisco.

I. POLICY

A. Bone Marrow Transplant (BMT) Precautions

1. BMT precautions are used in addition to Standard Precautions.
2. High Efficiency Particulate Air (HEPA) filtration is recommended.
3. Visitor screening for symptoms of communicable disease.
 - i. If a pediatric patient has ANC < 500, children < 10 years old are not allowed to visit.
4. See [Bone Marrow Transplant \(Pediatric\)](#) Nursing Procedure for details of isolation.

B. Hand Hygiene

1. All healthcare workers are required to follow the [Hand Hygiene Policy](#).
2. All care providers and visitors must either wash hands with soap and water or use alcohol-based hand rub when entering and leaving the patient's room.
 - i. In caring for the pediatric BMT patient, all health care personnel and visitors are required to perform a two minute scrub from elbows to fingertips using antimicrobial soap every shift, and anytime they leave the hospital.

C. Central Venous Catheter (CVC) Care and Maintenance

1. See [Central Venous Catheter \(CVC\) Care and Maintenance \(Pediatric/Neonatal\)](#) nursing procedure.

D. Plants and Flowers:

1. Live plants and flowers are prohibited from immunocompromised patient rooms and units (C6 HO and C6 BMT), as well as intensive care unit patient rooms. Vase water and soil contain large concentrations of potential pathogens and decaying organic matter may contain fungus.
2. Imitation plants and flowers are discouraged due to dust collection.

E. Environment of Care:

1. The use of fans is prohibited due to risk for dust and spore circulation and inhalation.
2. Caregivers should be educated to both limit and consolidate personal items in patient rooms to allow for adequate cleaning of surfaces by hospitality services.

F. Immunocompromised Precautions and Signage

1. Patients should be ordered for the following immunocompromised precautions, and the associated signage posted, for their respective indications:
 - a. [Low-Risk Immunocompromised Precautions](#)

- i. Most patients admitted for routine chemotherapy.
 - ii. Most patients receiving a solid organ transplant.
- b. [Moderate-Risk Immunocompromised Precautions](#)
- i. BMT patients who have achieved T-cell reconstitution and are on minimal immunosuppressive therapy.
 - ii. Neutropenic patients (ANC < 500 x 10⁶/L) on hematology/oncology service not meeting criteria for Low, High or Strict Immunocompromised Precautions.
- c. [High-Risk Immunocompromised Precautions](#)
- i. Patients with AML (newly diagnosed, relapsed or refractory).
 - ii. Patients with ALL: Infant, relapsed (not in remission), CAR-T cell therapy.
 - iii. BMT patients who have been readmitted without T-cell reconstitution.
 - iv. Neuro-Oncology patients receiving tandem autologous stem cell transplants on day +1 or upon transfer back to Neuro-Oncology service.
 - v. Other severely immunocompromised patients (e.g., being treated for GVHD, on immunosuppressive medication, with Chronic Granulomatous Disease, Job's Syndrome, and other neutrophil defects) may be considered for this category.
- d. [Strict Immunocompromised Precautions](#)
- i. All BMT patients from day of admission until discharge.
 - ii. Patients with a SCID diagnosis or other severe or combined immune defects (MHC-II, IPEX, ALPS, XLP, etc), until they have achieved T-cell reconstitution, if applicable.
- G. [Healthcare Workers:](#)
1. Healthcare workers with acute infections are restricted from work to prevent transmission to patients: [Infection Control Policy 3.2](#).
- H. [Room Placement:](#)
1. Single occupancy room with hand washing sink and private bathroom are required.
 2. Pediatric patients on Strict or High-Risk Immunocompromised Precautions must recover post procedures in a HEPA-filtered, private room, and should be preferentially placed in room 1, 2 or 15 (HEPA-filtered rooms) in the PICU, if available, when critical care needed.
- I. [Patient Care Recommendations:](#)
1. Minimize invasive procedures (e.g., bladder catheterization, IV catheter insertions, or IV line entries).
 2. Patients should have axillary temperatures and should not have their temperature taken by either oral or rectal routes.

II. PROCEDURES

- A. [Environmental Controls:](#)
1. Facilities Management inspects and performs preventive maintenance of duct and filter systems routinely.
 2. Facilities Management ensures dust mitigation measures are utilized during all construction activities at the Medical Center. Dust-generating construction activities that disturb existing dust or create new dust must be conducted in enclosures that prevent the

flow of particles into patient areas. [Construction Policy 5.1](#)

3. Protected Environments have specific maintenance schedules. Refer to [Facilities Management Building Services](#)

B. Water Supply Systems (*Legionella* spp. prevention)

1. San Francisco supplied water contains chloramine to reduce bacterial contamination. In addition, the potable water in Medical Center buildings is heated to 140°F, and delivered 120°F and 132°F, depending on the distance of the tap from the heat source. Warning signs are posted at each sink to alert hot water users.
2. In the event of waterborne illness, HEIC may institute interventions including but not limited to:
 - a. Restrict severely immunocompromised patients from showering.
 - b. Direct that water used for hematopoietic stem cell transplant patients' sponge baths is uncontaminated with *Legionella* spp.
 - c. Provide patients with sterile water for tooth brushing, drinking, and for flushing nasogastric tubing during a Legionellosis investigation.

III. HISTORY OF POLICY

Reviewed: 8/91, 4/01, 4/04, 11/04, 2/08, 4/12, 10/14, 5/19

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Immunocompromised Level	Patient Population	Room Type	Patient Movement/Child Life	Additional Comments
Strict	<ul style="list-style-type: none"> - BMT patients from day of admission until discharge - SCID diagnosis and with other severe or combined immune defects (MHC-II, IPEX, ALPS, XLP, etc.); required until they have achieved T-cell reconstitution 	<ul style="list-style-type: none"> - HEPA filtered, private room required - In PICU, this includes rooms 1, 2, 15, if available. - Recovery after procedures must take place a HEPA filtered, private room 	<p><i>Patient Movement</i> Must stay in their room May be permitted to go to BMT playroom with mask (except SCID patients prior to T cell reconstitution) May ambulate on unit while wearing a mask once ANC > 500 x 10⁶ cells/L for three consecutive days Are allowed to exit HEPA filtered area only for diagnostics or procedures that cannot be done at the bedside/unit.</p>	Perform a 2 minute antimicrobial scrub prior to caring for patient once a shift and upon re-entering hospital.
High Risk	<ul style="list-style-type: none"> - AML (newly diagnosed, relapsed, or refractory). - ALL: Infant, relapsed (not in remission), CAR-T cell therapy. - BMT patients who have been readmitted without T cell reconstitution - Neuro-Oncology patients receiving tandem autologous stem cell transplants on day +1 or upon transfer back to Neuro-Oncology service. - Other severely immunocompromised patients (e.g., being treated for GVHD, on immunosuppressive medication, with Chronic Granulomatous Disease, Job's Syndrome, and other neutrophil defects) may be considered for this category 	<ul style="list-style-type: none"> - HEPA filtered, private room required - In PICU, this includes rooms 1, 2, 15, if available. - Recovery after procedures must take place a HEPA filtered, private room 	<p><i>Patient Movement</i> Can leave room with mask, but must stay on HEPA filtered unit</p> <p><i>Child Life</i> Not permitted to participate in group activities, but can participate in private play/neutropenic time, including all child life spaces</p>	
Moderate Risk	<ul style="list-style-type: none"> -BMT patients who have achieved T-cell reconstitution and are on minimal immunosuppressive therapy -Neutropenic patients (ANC < 500) on hematology/oncology service not meeting criteria for Strict or High-Risk isolation. 	Recovery after procedures can occur in general recovery area.	<p><i>Patient Movement</i> Patient encouraged to stay in room, but permitted to leave with a mask</p> <p><i>Child Life</i> Not permitted to participate in group activities, but can participate in private play/neutropenic time, including all child life spaces</p>	
Low Risk	<ul style="list-style-type: none"> -Patients admitted for routine chemotherapy -Solid organ transplant patients 	Standard recovery precautions	<p><i>Child Life</i> Permitted to participate in group activities, including unrestricted use of all child life spaces.</p>	