

Office of Origin: Department of Hospital Epidemiology and Infection Control (HEIC)

## I. PURPOSE

Keeping immunocompromised patients safe from potential infections. The greater the impairment of the immune system, the greater the potential for infection. Reducing risk for infection combines strict attention to patient care practices and to maintenance of the inpatient environment.

## II. REFERENCES

- A. [Infection Control Policy on Hand Hygiene](#)
- B. [Dietary Guidelines for Adult Bone Marrow Transplant Patients](#)
- C. [Central Venous Catheter \(CVC\) Care and Maintenance \(Adult\)](#)
- D. [Central Venous Catheter \(CVC\) Care and Maintenance \(Pediatric/Neonatal\)](#)
- E. [Infection Control Policy on Healthcare Workers with Infections](#)
- F. [Infection Control Construction Policy](#)
- G. [Facilities Management Building Services](#)
- H. [Adult Blood and Marrow Transplant Program SOP # CL 121.04 Infection Control in the Adult BMT Patient \(Under Revision\)](#)

## 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 against 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  $\mu\text{L}$ ; 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/ $\mu\text{L}$  is defined as significant neutropenia and significantly increases the risk of infection.
- B. Immunocompromised Patients:
  1. Patients who are receiving immunosuppressive drugs.
  2. Patients with  $ANC 500 \times 10^6/\text{L} - 1000 \times 10^6/\text{L}$  cells.
- C. Severely Immunocompromised Patients: Patients with  $ANC < 500 \times 10^6/\text{L}$  cells.
- D. Neutropenic Precautions: Precautions designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in healthcare settings. Neutropenic Precautions apply to adult and pediatric patients with  $ANC < 500 \times 10^6/\text{L}$ . For adult patients with hematologic malignancies and all pediatric patients regardless of underlying diagnosis with an  $ANC < 500 \times 10^6/\text{L}$  Neutropenic Precautions will be instituted.
- E. Blood and Marrow Transplant (BMT) Precautions:

#### IV. POLICY

##### A. Blood and Marrow Transplant Precautions

1. BMT precautions are in addition to Standard Precautions.
2. High Efficiency Particulate Air (HEPA) filtration recommended for room.
3. Dietary restrictions:
  - i. [Dietary Guidelines for Adult Bone Marrow Transplant Patients](#)
4. Visitor screening for symptoms of communicable disease.
  - i. If patient has ANC <500, children <12 are not allowed to visit.
5. Adult BMT patients are confined to the BMT Unit even after ANC>500 and even if re-admitted if they have not recovered T cell immunity.
6. Pediatrics:
  - i. Confinement to room when ANC is <500 x 10<sup>6</sup>/L except for emergencies.
  - ii. When ANC>500 x 10<sup>6</sup>/L, may leave room but must stay in BMT Unit.
  - iii. Patients who are readmitted post-transplant must stay in room or may be in BMT Unit if ANC>500 x 10<sup>6</sup>/L.
  - ii. Sterile drinking water.
7. Live plants and flowers are not allowed.
8. Patients wear a surgical mask when outside their room.

##### B. Neutropenic Precautions

1. Neutropenic Precautions are in addition to Standard Precautions.
2. Dietary restrictions:
  - i. [Dietary Guidelines for Adult Bone Marrow Transplant Patients](#)
3. Visitor screening for symptoms of communicable disease.
4. Live plants and flowers are not allowed.
5. Patient wears a surgical mask when outside their room.

##### C. Hand Hygiene

1. All healthcare workers are required to follow the Infection Control [Hand Hygiene Policy](#).
2. In the pediatric Oncology and BMT unit, all health care personnel and visitors are required to perform a two minute scrub from elbows to fingertips using antimicrobial soap. Upon entering and leaving the patient's room all individuals must either wash hand with soap and water or use gel.

##### D. Central Venous Catheter (CVC) Care and Maintenance

1. [Adult CVC Care and Maintenance](#)
2. [Pediatric / Neonatal CVC Care and Maintenance](#)

##### E. Plants and Flowers Restriction: Vase water and soil in plants contain large concentrations of potential pathogens, and decaying organic matter may contain fungus. Live plants and flowers are restricted from intensive care unit patient rooms and immunocompromised patient rooms. Fake plants and flowers are discouraged due to dust collection.

##### F. Signage

1. Adult Units: "[IMMUNOCOMPROMISED PRECAUTIONS](#)" signs are affixed outside the room of neutropenic patients and/or BMT patients. Signage can be initiated by Nursing following Provider order set and DC'd with Providers orders.
2. Children's Hospital will use the following signage for the respective indications:
  - a. [Low-Risk Immunocompromised Isolation](#)

- i. Most patients admitted for routine chemotherapy.
    - ii. Solid Organ Transplant.
  - b. [Standard-Risk Immunocompromised Isolation](#)
    - i. Autologous BMT patients being readmitted with ANC > 500 x 10<sup>6</sup>/L.
    - ii. Neutropenic patients (ANC < 500 x 10<sup>6</sup>/L) on hematology/oncology service not meeting criteria for Low-Risk or Strict/High-Risk Immunocompromised Isolation.
  - c. [High-Risk Immunocompromised Isolation](#)
    - i. Patients with AML (newly diagnosed, relapsed or refractory).
    - ii. Patients being admitted for re-induction of therapy for ALL.
    - iii. Other severely immunocompromised patients (e.g., being treated for GVHD, on immunosuppressive medication) may be considered for this category.
  - d. [Strict Immunocompromised Isolation](#)
    - i. All BMT patients from day of admission until at least until ANC > 500 x 10<sup>6</sup> cells/: for 3 consecutive days.
    - ii. BMT patients who have been readmitted and have not recovered T-cell immunity.
    - iii. Patients with a SCID diagnosis.
- G. [Healthcare Workers](#): 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 suggested; however, Pediatric patients on Low-Risk or Standard Risk Immunocompromised Isolation do not require a private room.
  2. Pediatric patients on Strict/High-Risk Immunocompromised Isolation require a private room.
  3. For specifics on room screening refer to the Adult Blood and Marrow Transplant Program's SOP # CL 121.04 – Infection Control in the Adult BMT Patient (Under Revision).
- I. [Patient Care Recommendations](#):
  1. Minimize invasive procedures (e.g., bladder catheterization, IV catheter insertions, or IV line entries).
  2. Pediatric patients should not have their temperature taken by either oral or rectal routes, axillary temperatures only. Oral temperatures are acceptable in adult patients.

## V. 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 must be 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](#).



Water Supply Systems (*Legionella* spp. prevention)

- 4. San Francisco supplies water which contains chloramine to reduce bacterial contamination. In addition, the potable water in Medical Center buildings is heated to 140°F; temperatures at the tap are between 120 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.
5. In the event of waterborne illness, HEIC may institute the following interventions:
a. Restrict severely immunocompromised patients from showering.
b. Use water that is uncontaminated with Legionella spp. for hematopoietic stem cell transplant patients' sponge baths.
c. Provide patients with sterile water for tooth brushing, drinking, and for flushing nasogastric tubing during a legionellosis outbreak.

VI. HISTORY OF POLICY

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

Table with 2 columns: Name and Department. Rows include James O'Brian, PCM (Pediatric BMT), Florlina Agudelo, PCM (Adult BMT), Steve Miller, MD (Laboratory Medicine), Morton Cowan MD (Pediatrics BMT), Christopher Dvorak MD (Pediatrics BMT), Biljana Horn MD (Pediatrics BMT), Lloyd Damon, MD (Hematology/Oncology), Traci Hoiting (Nursing Administration), Deborah Rodriguez (BMT Program), Amy Nichols (Hospital Epidemiology and Infection Control), Anthony Kakis (Hospital Epidemiology and Infection Control), Sandra Kistler (Hospital Epidemiology and Infection Control), Catherine Liu, M.D. (Infectious Diseases), Margaret Feeney, M.D. (Pediatrics Infectious Diseases), and Bruce Mace (Facilities Management).

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