**GUIDELINE RECOMMENDATION FOR OBTAINING BLOOD CULTURES IN IMMUNOCOMPROMISED PATIENTS WITHOUT NEUTROPENIC FEVER**

Definitions:

Immunocompromised patients are

- Receiving active treatment for solid tumors and hematologic malignancies.
- Received a solid organ transplant and are taking immunosuppressive therapy.
- Received a chimeric antigen receptor T cell therapy or a hematopoietic stem cell transplant (within 2 years of transplantation or taking immunosuppression therapy).
- Have a moderate or severe primary immunodeficiency (e.g., DiGeorge syndrome, Wiskott-Aldrich syndrome).
- Have advanced or untreated HIV infection (defined as people with HIV and CD4 T lymphocyte cell counts <200/$mm^3$, a history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV).
- Are receiving active treatment with high-dose corticosteroids (i.e., ≥20 mg prednisone or equivalent per day administered for ≥2 weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents that are classified as severely immunosuppressive, tumor-necrosis blockers, and other biologic agents that are immunosuppressive or immunomodulatory (e.g., B cell-depleting agents).

Neutropenic fever

- Single oral temperature of ≥38.0°C (100.4°F) sustained over a one-hour period
- Absolute neutrophil count (ANC) <1500 cells/microL, severe neutropenia as an ANC <500 cells/microL or an ANC that is expected to decrease to <500 cells/microL over the next 48 hours

Recommendations:

1. Recommendations for obtaining blood cultures in immunocompromised patients without neutropenic fever are the same as immunocompetent patients.

**GUIDELINE RECOMMENDATION FOR OBTAINING BLOOD CULTURES IN IMMUNOCOMPROMISED PATIENTS WITH NEUTROPENIC FEVER**

Recommendations:

1. Initial blood cultures for patients with neutropenic fever
    a. At least 2 sets of blood cultures are recommended with a set collected simultaneously from each lumen of an existing central venous catheter (CVC) and from a peripheral vein site.

Note: A "set" consists of 1 venipuncture or catheter access draw of 20 mL of blood divided in to aerobic and anaerobic blood culture bottle, 10 mL for each bottle.

b. Two sets of blood cultures from separate venipunctures should be sent if no central catheter is present.
c. Blood cultures should be obtained prior to starting empiric antibiotics.

2. Patients with persistent neutropenic fever after empiric antibiotic started (day 2-3)
    a. Two sets of blood cultures (via catheter or periphery) can be obtained on each of the next 2 days if indicated.

3. Patients with persistent neutropenic fever after empiric antibiotic started (beyond day 3)
    a. Daily blood cultures should **NOT** be obtained if the blood culture from the first 3 days remains negative unless the patients have clinical deterioration.

    Note: There is increasing evidence to suggest that obtaining blood cultures beyond day 3 in stable patients with persistent neutropenic fever will not likely to yield any pathogens if blood cultures in the first day are negative.

    b. The patients should be carefully evaluated for other focal source of infection beside bacteremia or non-infectious causes of fever.

4. Recrudescent fever after initial defervescence occurs with empiric antibiotics.
    a. Any recurrent fever should be evaluated with cultures as a new episode of possible infection.

5. "Test of cure" > 48 H after initiation of appropriate antimicrobial therapy is recommended for patients with positive blood cultures for the following pathogens

    *Staphylococcus aureus (MSSA, MRSA)*
    *Staphylococcus lugdunensis*
    *Enterococcus spp*
    Gram negative bacteria especially multidrug resistant bacteria e.g*. Carbapenem-resistant Enterobacteriaceae*
    *Candida spp.*

    a. For "Test of cure", one set of blood cultures from peripheral sites should obtained after 48 H of initiation of appropriate antimicrobial therapy and every 48 H till the first negative blood culture status is confirmed.
    b. For *Staphylococcus aureus* bacteremia, two consecutive days of negative blood cultures are required to confirm "test of cure".
    c. Once one or two consecutive days of the negative blood cultures are confirmed, no additional blood cultures are needed.

References:


1. Freifeld A et al. Clinical Practice Guideline for the Use of Antimicrobial Agents in Neutropenic Patients with Cancer: 2010 Update by the Infectious Diseases Society of America. Clin Infect Dis 2011; 52: e56-e93.
2. Kimura S et al. Clinical Significance of Repeat Blood Cultures During Febrile Neutropenia in Adult Acute Myeloid Leukaemia Patients Undergoing Intensive Chemotherapy. Infect Dis (2017); 49: 748- 757.
3. Pappas et al. Clinical Practice Guideline for the Management of Candidiasis: 2016 Update by the the Infectious Diseases Society of America. Clin Infect Dis 2016; 62: e1- e50.
4. Petty, L et al. Repeated Blood Cultures in Pediatric Febrile Neutropenia: Would Following the Guidelines Alter the Outcome? Pediatr Blood Cancer (2016); 63: 1244- 1249.
5. Robinson, E et al. Reducing repeat blood cultures in febrile neutropenia: A single-center experience. Open Forum Infect Dis (2022); 9: ofac521.
6. Serody, J et al. Utility of Obtaining Blood Cultures in Febrile Neutropenic Patients Undergoing Bone Marrow Transplantation (2000); 26: 533- 538.
7. Thaden, J et al. Association of Follow-up Blood Cultures with Mortality in Patients with Gram-negative Bloodstream Infections. JAMA Network Open (2022); 5: e2232576.