

Leukemia Interventions

Leukemia includes a group of malignant disorders that affect the blood and blood-forming tissues of the bone marrow, lymph system, and spleen. The accumulation of dysfunctional immature white blood cells (WBC) prevent normal cell division regulation and may lead to fatalities (refer to the Picmonic on "Leukemia Assessment"). Diagnostic tools include bone marrow aspiration and x-rays. Interventions include chemotherapy, neutropenic precautions, and bleeding precautions. Additional interventions include bone marrow transplant, blood transfusions, adequate nutrition, and temperature monitoring.



PLAY PICMONIC

Diagnosis

Bone Marrow Aspiration

Bone Arrow Aspiration

Bone marrow aspiration provides a definitive diagnosis for leukemia. Analyzing the patient's bone marrow helps classify the patient's leukemia type and determine the stage of development. Determining the type of leukemia is critical because each classification has different prognosis and treatment plans.

X-Rays

X-Ray

X-rays show the size, shape, and condition of internal structures. They may be done to identify bone resorption issues or leukemia deposits in lungs. Patients with leukemia may have chest x-rays done to determine if the lungs are affected.

Interventions

Chemotherapy

Chemo-head-wrap

Since there are different drugs indicated for the various forms of leukemia, determining the patient's type of leukemia is critical before initiating treatment. Cytotoxic chemotherapy is the main form of drug therapy. Combination therapy is used to decrease drug resistance, minimize drug toxicity, and interrupt cell growth at various points of the cell cycle. During the induction therapy stage of leukemia treatment, drugs target and kill leukemic cells in the tissue, blood, and bone marrow to restore normal hematopoiesis for bone marrow recovery. The patient may become critically ill since the bone marrow is severely depressed. After induction therapy, leukemic cells are assumed to remain undetected and require further therapy to prevent cancer relapse. Afterwards, the patient is given high-dose therapy and later receives consolidation therapy in order to eliminate remaining leukemic cells that were not clinically evident. Maintenance therapy involves lower doses of the same drugs used earlier in treatment.

Bleeding Precautions

Bloody-Carrie with Precaution-sign

Patients with leukemia experience decreased platelet formation and increased risk of bleeding. Bleeding precautions are initiated to prevent complications such as hemorrhage. The smallest possible needle should be used to prevent excessive bleeding. Monitoring the patient for bleeding is critical for early intervention for preventing hemorrhage.

Neutropenic Precautions

Nude-peanut with Precaution-sign

Since infection is the primary cause of death in patients with leukemia, maintaining neutropenic precautions is critical for minimizing the risk of infection. During the induction phase of chemotherapy, the bone marrow is severely depressed and the patient may become critically ill.

Strict Asepsis

Strict-ruler A-sepsis-tank

Neutropenic precautions include strict aseptic technique. Since patients with leukemia develop dysfunctional immune system, minimizing the risk of infection is critical for preventing further complications and death.

Bone Marrow Transplant

Bone Train-plant

Bone marrow transplant, or hematopoietic stem cell transplant (HSCT) is administered to patients with different forms of leukemia. Bone marrow transplant is used to totally eliminate leukemic and hematopoietic cells of the body and replace them with allogeneic, syngeneic, or autologous stem cells. Since bone marrow transplant is a high risk procedure, patients must weigh the significant risks against the possibility of a cure.

Blood Transfusions

Blood Transfusion-IV

Blood transfusions may be necessary for patients with leukemia. Dysfunctional bone marrow production of normal cells leads to decreased levels of blood components. Low levels of red blood cells may compromise oxygen delivery to cells while decreased levels of platelets increases the patient's risk of bleeding (refer to the Picmonic on "Types of Blood Products").

Monitor Temperature Elevations

Monitor Up-arrow Thermometer

Patients with leukemia are immunosuppressed and have an increased risk of infection. In neutropenic patients, an elevation of 0.5°C or 1°F indicates the presence of infection. Monitoring the patient's temperature for elevation is critical in detecting infection and implementing therapy.

Adequate Nutrition

Nutritional-plate

Patients with leukemia may experience nausea, anorexia, and weight loss. Maintaining adequate nutrition is critical for promoting a healthy immune system to help the body fight off infections. Since appetite is usually decreased, encourage the patient to eat their favorite foods. Refer the patient for nutritional consult to help maintain adequate nutritional status.

Imatinib (Gleevec) for Chronic Myelogenous Leukemia (CML)

Eye-mat with CaMeL

Imatinib (Gleevec) targets the BCR-ABL protein in patients with CML (chronic myelogenous leukemia). This drug works by killing only the cancer cells, while leaving the healthy cells alone.