

Effects of Cancer Treatment on the Bone Marrow

The bone marrow is the factory where blood cells are made. Some types of chemotherapy slow down the factory and not as many blood cells are made. This can cause low levels of the three main types of blood cells:

- **White blood cells** (fight infection)
- **Red blood cells** (carry oxygen to the body)
- **Platelets** (help to stop bleeding)

We check your child's blood counts using a laboratory test called a **Complete Blood Count or CBC**. Blood counts are often lowest 7-10 days after chemotherapy is given, which is called the "nadir."

Type of Blood Cell	Normal Range
White blood cell	4.0-10.5 k/uL
Red blood cell	4.2-5.6 M/uL
Platelets	160-370 K/uL

Leukopenia (Low White Blood Cell Count)

White blood cells fight infection. When your child has a low white blood cell count, the risk of infection increases. This is called **leukopenia**.

There are different types of white blood cells that have different jobs.

- **Neutrophils:** Fight infection
- **Lymphocytes:** Make antibodies to fight infection
- **Monocytes:** Fight infection by killing and removing bacteria
- **Basophils and eosinophils:** Respond during allergic reactions

A term you will hear often is **Absolute Neutrophil Count or ANC**. The ANC is the total number of neutrophils in the white blood cell count. A low neutrophil count is

called **neutropenia**. When your child's ANC is less than 500, the risk of infection is high. During this time, it is very important to avoid crowds, avoid people who are sick, and focus on good handwashing.

If your child has a fever while their ANC is low, they may need to be admitted to the hospital for antibiotics. Chemotherapy may need to be delayed until the ANC increases.

Anemia (Low Red Blood Cell Count)

Red blood cells carry oxygen through the body. There are two tests that measure the number and function of red blood cells.

- **Hemoglobin:** A protein in the red blood cells that carries oxygen.
- **Hematocrit:** The percentage of blood made up of red blood cells.

When these tests results are low, the body is not able to carry as much oxygen around the body. This is called **anemia**. A blood transfusion may be given if your child's hemoglobin is too low.

Symptoms of Low Hemoglobin

- Energy levels decreasing through the day or needing more rest periods
- Increased tiredness
- Shortness of breath
- Headache
- Fast heart rate
- Pale skin and/or pale gums
- Dizziness

Call if your child is having any these symptoms. A blood transfusion is needed when the hemoglobin is less than 7 (or with a higher hemoglobin with symptoms of anemia).

Thrombocytopenia (Low Platelet Count)

Platelets stop bleeding in the body by forming clots. When your child has a low platelet count, the body is not able to clot well and the risk of bleeding increases. This is called **thrombocytopenia**.

Signs of a Low Platelet Count

- Easy or excessive bruising, especially in locations that bruising is not expected
- Petechiae (small, pinpoint spots on the skin)
- Bleeding from the nose or gums
- Black stools or vomit may mean blood is in the stomach or bowel)

Call if your child is having any these symptoms. A platelet transfusion is needed when the platelets are less than 10 (or with higher platelet counts with symptoms of bleeding).

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 9/2024. University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#8367.