Blood and blood counts

Disclaimer: This fact sheet is for education purposes only. Please consult with your doctor or other health professional to make sure this information is right for your child.

This information sheet will tell you in simple terms about:

- blood and blood cells
- why we measure the blood count frequently
- treatment of low blood counts.

Blood and blood cells

Blood carries oxygen and nutrients to the whole body, and carries waste products to the lungs and kidneys. Blood has many complex parts. The major part of blood is a clear liquid called **plasma**. Carried in the plasma are three main types of **blood cells** (red cells, white cells and platelets), each of which has a special function. All blood cells are made in the **bone marrow**, which is found in the hollow centre of bones. The bone marrow makes new blood cells all the time to replace old blood cells. We check the blood with a test called a **full blood count** (FBC).

Red Blood Cells (erythrocytes, RBC)

Red blood cells carry oxygen from the lungs to all parts of the body. When you do not have enough red blood cells, you have **anaemia**. You may look pale, and feel tired or short of breath. We check the number of red blood cells by measuring the **haemoglobin** (Hb) in the blood. The haemoglobin is the substance in the red cell that carries oxygen and makes the cells look red. The normal level of haemoglobin in children is between 90 and 150 (grams in 1 litre of blood).

White Blood Cells (leukocytes, WBC)

White blood cells help fight infection by destroying germs such as bacteria and viruses. There are five types of white cells. The most important white cells are called **neutrophils**. Neutrophils help the body fight bacterial infections. They live for a few hours, and are always being replaced by the bone marrow. The blood normally contains 1000 (1.0) or more neutrophils (per cubic millilitre of blood). If you have less than 1000 neutrophils you are **neutropaenic** (not enough neutrophils). As the neutrophil count drops you are at risk of getting a serious bacterial infection, and may not be able to fight the infection well.

Platelets

Platelets help the blood clot. Platelets only live for a few days, and are being constantly made by the bone marrow. If you have a low number of platelets you will bruise and bleed more easily. You may notice nose bleeds, bleeding from your gums, or a fine purple rash. The blood normally contains more than 150 platelets (x 10^9 per cubic millilitre of blood).

Aspirin and similar anti-inflammation drugs such as Neurofen or Voltaren affect the way platelets work. If the platelet count is low, these drugs can cause serious bleeding. Children having treatment for cancer should **not** be given these drugs unless your doctor approves. Use paracetamol (Panadol, Dymadon, Tylenol) for fever or pain.

Why do we check the blood count?

Chemotherapy drugs work by killing cells which grow quickly, such as cancer cells. Other fast-growing cells in the body include the bone marrow cells (and the hair cells and the cells that line the mouth and gut). When we give chemotherapy to kill the cancer cells, one side effect of many of the drugs is to affect the bone marrow function. This means that after a course of chemotherapy the bone marrow stops making new blood cells to replace the ones that grow old and are recycled.

Around one week after the chemotherapy, the blood count falls. Usually, the white cells and platelets are affected more than the red cells. The blood count stays low for a while (one to three weeks) and then gradually rises as the bone marrow recovers. We check the blood count regularly after chemotherapy for several reasons:

- to watch the recovery of the bone marrow so we know when we can give the next chemotherapy
- in case we need to treat the low blood counts.

What do we do if there is a low haemoglobin (low red cell count)?

You may notice that your child is pale and tired. They may have less appetite for food. A haemoglobin level between 90 and 70 is mild anaemia, and usually does not require treatment. If the haemoglobin is less than 70, we usually give a blood transfusion to increase the number of red cells. After the transfusion, your child will have more energy and will look less pale. Some older children, especially teenagers, feel tired and unwell when their haemoglobin falls below 90, and may need to have transfusions earlier.

What do we do if there are low white cell or low neutrophil counts?

Your child is at risk of serious infection. Most children remain well and do not get infections. If your child has a fever (temperature of 38.0 degrees or higher), or looks unwell, or is shivering and shaking, he or she may have a serious infection.

- Ring the hospital **immediately** and follow the instructions they give. You will usually be asked to come to the hospital, where the blood count will be checked. Intravenous antibiotics are usually started quickly.
- You do not need to check your child's temperature regularly at home – only if you feel that he or she is hot or unwell.

What do we do if there is a low platelet count?

You may notice some bruising or bleeding. If the platelet count is less than 10 your child has an increased risk of having a serious bleeding problem, and we may give a platelet transfusion to raise the platelet count to a safer level.

If your child has bleeding that will not stop (such as a prolonged nose bleed), you should contact the hospital **immediately**. A transfusion of platelets is often given to help stop the bleeding even if the count is not less than 20.

Why do we have to delay treatment if the count is low?

In most cases, if the neutrophil count is less than 1000, or the platelet count is less than 100, the planned chemotherapy is delayed. The bone marrow has not yet recovered from the previous course of chemotherapy. If you went ahead and gave the planned chemotherapy, the bone marrow would be more severely affected, and the blood count drop even lower.

Some chemotherapy drugs (like vincristine, prednisolone, asparaginase and cisplatin) do not affect the bone marrow. These are usually given as planned even if the count is low.

Does the blood count tell us how well the cancer treatment is going?

NO. The blood count does not tell anything about how well the treatment of the cancer is going. We check the blood counts to check on the side effects of the chemotherapy, and to decide when the next treatment will be given. Depending on the type of cancer your child has, X-rays, scans or bone marrow tests are used to check on how well the treatment is going.

If you have any questions about the information on this sheet or any other questions related to your child's cancer or the treatment, please ask the oncology team!

Any questions about this information may be directed to the Oncology Treatment Centre on 9845 2115 (8am-4pm) or Camperdown ward on 9845 1123.
Further sheets are available from the Oncology staff or The Children's Hospital at Westmead's website at www.chw.edu.au. Updated **April 2003**.