

# NIH Clinical Center Patient Education Materials

## Understanding your complete blood count (CBC) and common blood deficiencies

Below you will find information to help you understand your complete blood count. You will also learn about neutropenia, anemia, and thrombocytopenia, which are three kinds of blood deficiencies.

### **What is a complete blood count (CBC)?**

A complete blood count (CBC) is a common blood test that gives doctors information about five major parts of your blood: three types of cells (red blood cells, white blood cells, and platelets) and two values (hemoglobin and hematocrit values). Normal ranges may be slightly different for men and women. The five parts of a CBC are:

#### **White blood cell (WBC) count**

White blood cells help your body fight off infections. The normal range for WBC is 5 to 10 K/uL. Your CBC will also measure what is called the ANC (absolute neutrophil count). That is the specific number of white blood cells in your blood that fight infection.

#### **Red blood cell (RBC) count**

Red blood cells carry oxygen and remove waste from your body. These cells also have a protein in them called hemoglobin, which is what makes red blood cells the color red. The normal range for RBC is 4 to 5.5 M/uL.

#### **Hemoglobin (HGB) value**

Hemoglobin carries oxygen from your lungs to the rest of your body and also moves carbon dioxide (waste) to your lungs so that you breathe it out. The normal range for HGB is 12 to 17.4 g/dL.

#### **Hematocrit (HCT) value**

The hematocrit value measures how much of your total blood count is made up of red blood cells. The normal range for HCT is 36 to 52%.

#### **Platelet count**

Platelets help stop bleeding by sticking together to form blood clots, which “plug” cuts and wounds. A normal platelet count range is 140 to 400 K/uL.

### **Blood Disorders**

Sometimes, your CBC may show that your counts or values are too low. For example, you might not have enough white blood cells, or your platelet count could be lower than normal. When this happens, it can cause health problems.

#### Neutropenia (low white blood cell count)

If you have neutropenia, then you do not have enough white blood cells (called neutrophils) that fight off infection. In other words, your ANC (absolute neutrophil count) is too low.

The lower your ANC is, the more likely that you are to have health problems:

- If your ANC is lower than 1,000 (1.0K/uL), then you have a higher risk of getting an infection.
- If your ANC is lower than 500, then you have a higher risk of getting a more serious infection.

You can pick up these infections through the air, blood, sweat, and saliva. And, some germs can get into your body when you touch something with germs on it and then touch your eyes, nose, or mouth.

The steps below will help you avoid germs and help keep you safe while your white blood cell count is low.

**Did you know?**

Hand washing is the single most important thing that you can do to protect yourself from infections.

- Wash your hands often, including before you eat and after you:
  - Use the bathroom
  - Cough, sneeze, or blow your nose
  - Shake someone's hand
  - Touch anything handled by others
- Take a shower or bath every day.
- If your skin gets dry, use unscented lotion or oils. This will help stop your skin from cracking, which can let in germs.
- If you cut or scrape yourself, clean the area with soap and warm water right away. Then cover it with a bandage.
- Always wear shoes in the hospital and at home.
- Rinse your mouth out with water after you eat and before you go to bed.
- Use an ultra-soft toothbrush, and only floss if your ANC is higher than 500 and your platelet count is 50,000 or higher.
- Use lip balm (like ChapStick) on your lips to prevent chapping.
- If you wear dentures, make sure that they fit well.
- Check with your doctor before you see the dentist.
- Ask someone else to clean around the house, especially litter boxes, birdcages, and fish tanks.
- Do not touch fresh flowers, houseplants, dirt or soil, or stagnant (still) water, and do not keep any plants in your home, not even dried flowers. Ask your doctor about when it is safe to have plants or flowers near you.
- Avoid crowded places, and stay away from people who are sick.
- Never swim in lakes, ponds, rivers, or oceans. If you want to swim, talk it over with your doctor or nurse first, and swim only in a pool that is treated with chlorine to kill germs. Also, stay out of hot tubs and Jacuzzis.
- Keep away from construction sites, since germs can hide in dirt and dust.
- Use an electric shaver instead of a razor, and do not get a manicure, pedicure, or fake nails (or nail tips).
- Prevent cuts and tears in your rectum by avoiding enemas, rectal thermometers, or suppositories (medicines that you put in your anus).
- Women need to avoid tampons, vaginal suppositories (like for a yeast infection), and douches.
- Be sure not to get any vaccines (like a flu shot) unless your doctor tells you to.
- Use a water-based lubricant during sex.
- Avoid anal sex. It is more likely than vaginal sex to cause cuts and tears.

### **Prevent catheter infections**

You will need to check for infections if you have a catheter (a special tube that helps you get medicine or nutrients). Look around the area where the catheter goes into your body. Look in your mouth and groin, since these areas have lots of germs that can cause infections.

Call your doctor or nurse right away if you notice:

- Redness
- Swelling
- Pain or tenderness
- Drainage (liquid coming from the place where the tube goes in)
- A bad smell

When you have neutropenia, you need to watch for signs of infection. Check your temperature at least once a day. Your doctor or nurse may tell you to check it more often. If you have a fever, that is a sign that you might have an infection.

- Call your doctor or nurse right away if:
  - Your temperature is between 100.4 and 100.9 °F two or more times in one day
  - Your temperature ever reaches 101.0 °F or above
  - You are:
    - Short of breath or having chest pain
    - Experiencing chills or have flushed skin
    - Sweating
    - Urinating (peeing) often
  - Feeling burning when you urinate
  - Red, tender, or have pain anywhere on your body
  - Feeling run down or having other flu-like symptoms, like:
    - Sore throat
    - Sneezing
    - Runny nose
    - Coughing
    - Stomach problems (feeling sick, throwing up, diarrhea)

Your doctor and nurse can look for signs of infection by testing your blood and urine. They may also do a chest x-ray. If you have an infection, your doctor will give you medicine to fight it.

### Anemia

If you have anemia, then you do not have enough red blood cells in your blood, and your hematocrit and hemoglobin levels are too low. Many different things, like medicines, low vitamin levels, and diseases, can cause anemia. Your doctor will run tests to find out the cause and figure out the best treatment. People with serious cases of anemia may need a blood transfusion to keep them safe.

When you are anemic, you may feel weak and tired. You may also experience dizziness, shortness of breath, racing heartbeat (heart palpitations), pounding in your head, and ringing in your ears.

To prevent symptoms of anemia, rest often during the day, especially between activities; make sure that you get enough sleep at night; and get up slowly if you have been sitting or lying down. This can help you feel less dizzy.

### Thrombocytopenia

If you have thrombocytopenia, then you do not have enough platelets in your blood, and your blood will not clot normally.

When you have thrombocytopenia, you may bruise easily. You may also experience:

- Tiny red or purple spots on your skin (petechiae)
- Nose bleeds
- Bleeding gums
- Cuts that keep bleeding
- Black or bloody stool (poop)
- Brown or red urine (pee)
- Heavy periods (increased bleeding from the vagina)

There are lots of over-the-counter (OTC) medicines that can keep your platelets from working the way that they are supposed to, especially medicines that have aspirin in them. So when your platelet count is low, talk with your doctor or nurse before you take any new medicines.

- Never take any medicine that has aspirin in it. Check the list at the end of this fact sheet for names of common medicines that have aspirin in them.
- You will also need to avoid some other common OTC medicines, including:
  - Ibuprofen (Motrin, Advil, Midol, Pediacare Fever)
  - Naproxen (Naprosyn, Naprelan, Aleve, Anaprox)

Make safe choices for personal care:

- Use an ultra-soft toothbrush to keep your gums from bleeding. If your gums bleed when you brush your teeth, use Toothettes (special mouth swabs) instead of a toothbrush.
- Only floss your teeth if your platelet count is 50,000 or higher.
- Use an electric shaver rather than a razor, especially if your platelet count is lower than 20,000.
- When you blow your nose, be gentle.
- Never use enemas, rectal thermometers (thermometers that go in the anus), and suppositories.
- Women should not douche or use tampons or vaginal suppositories (like for a yeast infection).
- If you have sex, use water-based lubricants. If your platelet count is too low, sex may not be safe. Check with your doctor.
- Eat a balanced diet, so that you do not become constipated
- Avoid eating foods that might upset your stomach, like popcorn or apple peels.
- Choose loose-fitting clothing and avoid anything with tight waistbands.
- Wear shoes in the hospital and at home.
- Ask your doctor before gardening. If your doctor says it is safe, then you can garden with gloves on.
- Avoid certain activities, including using sharp knives or blades and contact sports, such as football and hockey.

Call your doctor or nurse right away if you have any of the following symptoms:

- New tiny red or purple spots on your skin (about the size of a pinpoint or larger)
- New bruises on your body
- Nosebleeds
- Bleeding gums

- Bleeding from an area where you had a procedure (like where you got a catheter)
- Blood in your urine or stool
- Headaches
- Feeling very tired
- Confusion
- Falling down

**Common products that have aspirin in them:**

Acetylsalicylic acid	Butalbital compound	Norgesic Forte
ASA	Carisoprodol compound	Norwich products
Adprin-B	Combiflex	PAC Analgesic
Adult Analgesic Pain Reliever	Cope	PAC tablets and capsules
Aggrenox	Durabac	Painaid products
Alka Seltzer products	Easprin	Pain Reliever
Alor 5/500	Ecotrin	Pamprin products
Anacin products	Emagrin Forte	Panasal 5/500
Arthritis Foundation Pain Reliever	Emagrin	Pepto-Bismol
Arthritis Pain Formula	Empirin	Percodan
Ascomp with codeine	Empirin with codeine	Robaxial
Ascriptin products	Equagesic	Saletto
Aspercin	Excedrin products	Sodol compound
Aspergum	Fiorinal tablets and capsules	Soma compound
Aspirin	Goody's Extra Strength	Soma compound with codeine
Aspirin	Goody's Headache Powder	St. Joseph Low Dose Adult Aspirin
Aspirin	Goody's Body Pain Powder	St. Joseph Low Dose Adult Aspirin
Aspirin	Halfprin	St. Joseph Low Dose Adult Aspirin
Aspirin-mox	Heartline	Stanback powder and tablets
Back-Quell	Levacet	Synalgos-DC
Bayer products	Lortab ASA	Talwin compound
BC Powder	Momentum	Vanquish
BC products	Orphengesic products	Zee-SeltzerZorprin
Buffasal	Norgesic	
Bufferin products		

This information is prepared specifically for persons taking part in clinical research at the National Institutes of Health Clinical Center and may not apply to patients elsewhere. If you have questions about the information presented here, talk to a member of your health care team.

Products/resources named serve as examples and do not imply endorsement by NIH. The fact that a certain product/resource is not named does not imply that such product/resource is unsatisfactory.

National Institutes of Health Clinical Center

Bethesda, MD 20892

05/2015

[Questions about the Clinical Center?](#)

