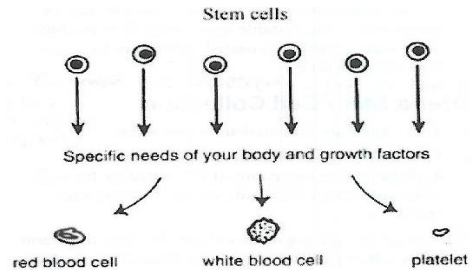


What are stem cells?

Stem cells are immature blood cells. They form in the bone marrow. As stem cells mature they develop into red blood cells, white blood cells, or platelets depending on what the body needs at the time. Stem cells can be collected from a person's blood by means of a procedure called peripheral blood stem cell collection (PBSC), and/or from the bone marrow via a bone marrow harvest.



What is a peripheral blood stem cell collection?

It is a procedure that separates and collects one type of white blood cell – called a mononuclear cell – from the blood. These white cells are important because the stem cells separate out along with them. The separation and collection is done by the cell-separator machine. Except for a small number of red blood cells, the machine returns all the blood to the person.

Why is peripheral blood stem cell collection necessary?

Your child's treatment will involve high dose chemotherapy and/or bone marrow transplantation. After high doses of chemotherapy, the bone marrow cannot make blood cells. But, if we collect, freeze and store stem cells, they can be thawed and put back into the blood after the high dose chemotherapy. These stem cells will return to the bone marrow

and create new blood cells to replace those that have died.

Preparing the blood for a PBSC

Your child will need injections of a substance (growth factor) called G-CSF. G-CSF encourages the bone marrow to make stem cells and moves the cells into the blood stream. You can give these injections at home – the staff will show you how. You give them daily until the number of these cells in the blood reaches its peak. This peak period lasts only 24-48 hours and is the best time for collection.

Your child will need daily blood tests several days before the collection date to check on the number of stem cells. The first few blood tests can be done by your local laboratory. But, as your child's blood count rises, the counts must be precise. This kind of count is done only at the Children's Hospital laboratory. You will need to be in Vancouver for this daily blood count for several days before the collection date.

What will happen on the day of collection?

The nurse will take some blood samples and check your child's weight, height, blood pressure, pulse, and temperature.

When the cell separator machine is set up, your child is connected to it with:

- Needles, and tubing in the arm veins if these veins are suitable, OR
- A special venous catheter usually set into a big vein in the groin area, OR
- A special central venous catheter in place that allows for stem cell collection.

The staff will check your child's veins several days before the procedure and suggest which is best for your child. If your child's connection will be with needles in the arms, the staff will show you how to apply EMLA (a freezing cream for the skin) on your child's arms ahead of time.

If your child needs a catheter, a physician in the intensive care unit will insert it while your child is under sedation the day before or on the day of collection. Your child needs to stay in hospital while the catheter is in place. Sometimes a child needs to fast before sedation. The staff will let you know about this.

Your child will be in a room for the 4 to 5 hours of collection. You can bring your favourite books, videos or activities to help pass the time. Your child is free to eat, sleep, or visit with friends and family. Often the slight humming sound of the machine puts children to sleep.

At the end of the day, the staff will determine whether we have collected enough cells or if the procedure needs to be repeated the next day.

Preparing your child for a PBSC

We suggest that you prepare your child for this in the same way you do for other procedures. Ask for the pamphlet called "Helping your Child Manage Medical Procedures" for some tips. Children who understand what is happening have more feeling of control.

After a Stem Cell Collection

1. Your child may feel tired and require rest.
2. Your child may have received large volumes of fluid during the procedure. If instructed by the staff, make sure your child voids within 4 hours of the procedure.

3. Contact the oncologist on call at (604) 875-2161 if the arm veins and/or catheter site is very bruised or continues to bleed.

What are the possible side effects?

PBSC is a safe procedure for children. But, as with any procedure, complications may happen.

1. The anticoagulant used to keep your child's blood from clotting in the machine may lower the amount of calcium in the blood. Your nurse will watch for early signs of low calcium, most frequently a tingling sensation on the lips, and take steps to prevent the problem. Most children have no problem because the body removes the anticoagulant from the bloodstream quickly. You can help prevent low calcium by giving your child milk or milk products during the collection and for breakfast (unless your child is asked to fast the morning of the procedure).
2. The procedure may lower your child's platelet count and hemoglobin. Your child will have a complete blood count drawn before and after the procedure. This reduction does not matter unless the counts were very low before the procedure. In this case, the doctor may decide that your child needs a transfusion.
3. If your child's arm veins are used, the arm may be tender and uncomfortable for a while. If your child has a venous catheter inserted, there may be some bruising at the site.
4. Some children may have an allergic reaction to the fluids used for replacement. Your child's nurse will monitor for side effects such as, fever, chills, nausea, vomiting, back pain, difficulty breathing, itching and hives.

Frequently Asked Questions

Is the procedure painful?

- A. If your child does not have a special venous catheter, insertion of needles may cause some discomfort. Keeping your child's arms in one position and remaining relatively still may also be uncomfortable.

How long does the stem cell collection take?

- A. The length of procedure is different for each patient. Most PBSC procedures take approximately three to four hours.

How often do stem cell collections need to be performed?

- A. Generally, only one day of collection is needed. The number of PBSC procedures will depend on the stem cell count in the final product. The physician monitors your child's response and decides on the number of procedures needed.

If you have any questions about the procedure, please feel free to speak to one of the apheresis staff in the Oncology/Hematology Clinic who is familiar with Peripheral Blood Stem Cell Collection procedures
Telephone (604) 875-2345 local 7079

At Children's & Women's Health Centre of British Columbia we believe parents are partners on the health care team. We want you to be as informed as possible. This brochure will answer some of your questions. Please ask about things you do not understand and share your concerns.



Peripheral Blood Stem Cell Collection



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