

## Autologous Stem Cell Transplant Utah Blood and Marrow Transplant Program

Stem cell transplant is treatment for several forms of blood cancer, including leukemia and multiple myeloma. It is also a treatment for serious diseases that are not cancer such as aplastic anemia.

Problems in the bone marrow cause all these diseases. To understand how a stem cell transplant works, it is important to know how bone marrow works in your body.

### What is bone marrow and what does it do?

Bone marrow is spongy material inside bones. Stem cells in the bone marrow develop into different types of blood cells. Each cell type has a function:

- Platelets help blood clot to control bleeding.
- Red blood cells carry oxygen throughout the body.
- White blood cells help fight infection.

Bone marrow makes new cells and sends them into the blood as old cells die. This process is always happening so the blood has fresh cells whenever it needs them.

In an autologous stem cell transplant, the transplant team collects and saves your own healthy stem cells. You get high-dose chemotherapy to treat the disease. You may also get radiation treatments. After the treatments, you get your healthy stem cells back.

### Steps in the Transplant Process

**Priming (Also Called Mobilization).** The first step in the transplant process is priming. This stimulates your bone marrow to create and release stem cells into your bloodstream. The transplant team may use a combination of chemotherapy, Neupogen®, or other agents for priming. Your transplant doctor will choose the method best for you.

Once you begin priming therapy, the transplant team will do blood tests every day. These tests check to see there are enough stem cells in your bloodstream to begin collection.

**Collection.** For most patients, the method of collection is peripheral stem cell (PBSC) collection. PBSC means stem cells circulating in your blood.

The collection takes place outpatient at the Blood and Marrow Transplant (BMT) clinic. PBSC collection is a non-surgical procedure called apheresis. The transplant team places a central line or a temporary catheter (IV line) into one of your veins to collect blood. Your blood goes into an apheresis machine that removes the stem cells from your blood. The rest of your blood comes back to you through a second IV line into a different vein.

The transplant team processes, freezes and saves your stem cells. You will get them back later in the transplant process.

Typically, the collection takes 1-4 days but can take longer in some cases. The number of days varies from person to person and depends on the type of priming you receive. Collection takes about 4 -6 hours each day.

Sometimes the collection process can make you feel lightheaded and make your lips, hands, or toes feel tingly or numb. Tell your nurse if this happens. The nurse can give you medicine to help.

Some patients need to have bone marrow collection instead of PBSC. Your transplant doctor will tell you if bone marrow collection is best for you.

If you need bone marrow collection, you will stay in the hospital for the procedure. You will be taken to the operating room and get medicine so you feel no pain. The transplant doctor uses a large needle to take bone marrow from your hip bone.

The stem cells from the fresh bone marrow are processed, frozen and then given back to you through your IV line later in the transplant process.

**Conditioning Regimen.** To prepare you for the stem cell transplant, you will receive high doses of chemotherapy. This is called pre-transplant conditioning or preparative regimen. The time for this regimen can vary in length from 1 day to 2 weeks before you get your stem cells back.

Depending on your treatment plan, you may also get radiation treatments to your entire body. This is called total body irradiation (TBI).

Pre-transplant conditioning treatment destroys any remaining disease and prepares your marrow for new stem cells. They can also harm other healthy cells in your bone marrow. Your transplant team will tell you about the possible risks.

**Transplant.** The day your stem cells are returned is called your transplant day. It is called Day 0. All days before the transplant have “minus” numbers. All days after it have “plus” numbers. For example, you may have chemotherapy on Day -4 through Day -1. The day after your transplant is Day +1.

After the pre-transplant conditioning regimen, the transplant team will return your frozen stem cells. The stem cell technician prepares the stem cells for infusion. The transplant nurse will give the stem cells to you through your IV line.

Your transplanted stem cells will move from your bloodstream to the bone marrow. They will begin to create new blood cells. The transplant team will test your blood often to keep track of this process.

Your immune system will be very weak. You will get several medicines to prevent infections.

Your nurse will check your temperature often because fever is a sign of infection.

In the days after your transplant, you are likely to have side effects from chemotherapy and radiation:

- Nausea and/or Vomiting
- Fatigue
- Fever
- Rashes
- Mouth sores
- Constipation
- Diarrhea

Your transplant team will tell you ways to prevent and ease these side effects.

**Engraftment.** Engraftment means that the transplanted stem cells have started producing white blood cells, red blood cells, and platelets. After your transplant, your team will perform an absolute neutrophil count (ANC). This tests your blood to see how many neutrophils, a type of white blood cell, are present. When your ANC is

more than 500 for three days in a row, engraftment has happened.

The engraftment date varies from person to person. Once you have engrafted, your immune system will begin to get stronger again. Your transplant team can then stop some of the medicines that prevent infection.

**Recovery.** After engraftment and you are well enough, you can leave the hospital. If you live within 40 miles (60-minute drive) of Huntsman Cancer Institute, you can go home. If you live farther, you need to stay in local lodgings for at least 100 days after Day 0.

If you received your transplant outpatient, you must live within 20 miles (30-minute drive) for at least 100 days after transplant date (Day 0).

You will be in recovery. You will still have a high risk of infection. Some patients have a hard time with infections, nausea, or diarrhea after leaving the hospital.

You will need a caregiver to help you at home 24 hours a day after you leave the hospital for at least 30 days after your transplant (Day 0). You must come for follow-up outpatient visits at the BMT Clinic 1-3 times a week. At these visits, the transplant team will check your health and you will have blood tests. You may get IV fluids or blood transfusions. The transplant team will adjust your medicine as needed and monitor you for infection.

The transplant team also works with a home health care agency that can give IV medicines and fluids if you need them between visits. Some problems may require you to go to the BMT more often and you may need to stay in the hospital again.

About 100 days post-transplant, you and your caregiver will meet with a BMT staff member to review best practices for your safety after your BMT visits end. You will also receive a survivorship care plan that include the following:

- Details of your transplant therapy
- What to watch for
- Schedule for follow-up visits with your transplant doctor at the clinic