

Keck Medical Center of USC

Keck Hospital of USC USC Norris Cancer Hospital Transfusion-Free Medicine Program

Transfusion-Free Medicine Program (TFMP) is designed to meet the individual needs of patients who do not wish to receive blood transfusions. Traditionally, Jehovah's Witnesses have been the primary users of transfusion-free medicine because of their religious convictions against receiving blood transfusions. However, there are many other reasons why patients choose transfusion-free alternatives.

Achieving these objectives requires the support of physicians and surgeons who are expert in the use of innovative techniques and strategies that minimize blood loss, and thereby obviate the need for blood products including whole blood, red cells, white cells, platelets, plasma (FFP), and pre-autologous donation.

How does transfusion-free medicine work?

The primary goal of transfusion-free medicine and surgery is to use a variety of medications, blood conservation and surgical techniques, and special machines to minimize blood loss. In most cases, one or more of the following procedures may be used to accomplish a transfusion-free or "bloodless" surgery:

- The patient's blood may be filtered through a specialized device called a "cell-saver." During surgery, blood that is lost is usually disposed of with other fluids. However, by using the cell-saver machine a surgeon can collect, wash, filter and return this blood back to the patient.
- Surgical instruments that use electrical current to cut tissue and seal blood vessels are used to prevent blood loss.
- Medicines such as erythropoietin (also known as Epogen (EPO) or Procrit) can be used to naturally stimulate the bone marrow to make more red blood cells.
- Specific medications to encourage clotting may be administered to prevent excessive bleeding due to surgery or because of diseases like cirrhosis of the liver that affect the body's ability to clot properly.
- Anesthesiologists can use normal saline solution or other intravenous solutions to perform blood-dilution techniques to conserve blood during surgery. They can also lower a patient's blood pressure and temperature to reduce the possibility of major bleeding.

Essential to ensuring the best outcome for patients desiring transfusion-free services is a clear understanding of the transfusion alternatives that are *acceptable*, and those that are *unacceptable*. The TFMP Product/Treatment/Procedure Form is the primary tool used at our facility to document each patient's wishes regarding transfusion alternatives that involve **blood fractions** and procedures/equipment involving the use of one's own blood. The following is a brief overview of each of the products, treatments and procedures listed on the form.

- ◆ **Albumin:** A plasma protein fraction synthesized (naturally produced) in the liver. It is often given in a 5% solution in normal saline called “Plasmanate.” It is distributed throughout the body by means of the circulatory system. It can be said that albumin uses the circulatory/blood system as a means of transport, much like a bus that takes people from point A to point B. Albumin is used to help maintain intravascular volume. In other words, this protein helps to keep blood and other fluids that flow through the body in their proper place. It is prepared by fractionating blood from healthy donors and heating it to 60 degrees Celsius for 10 hours which inactivates Hepatitis, HIV and other blood borne diseases.
- ◆ **Erythropoietin (EPO):** Also known by its brand names Epogen, Aranesp or Procrit, this is a recombinant (genetically engineered) protein molecule produced in a laboratory. Endogenous (arising from causes within the body) erythropoietin is a naturally occurring hormone produced in the kidneys that stimulates the bone marrow to produce red blood cells. Since most EPO products are *buffered* or *stabilized* with a small percentage of albumin (see above), it is a matter of personal choice for patients who are Jehovah’s Witnesses. Otherwise, it is a man-made product.
- ◆ **Thrombolytic enzymes:** A group of drugs used to “break-up” or dissolve blood clots in *thrombosis*, *embolism*, and *myocardial infarction* (heart attack). Similar to EPO, some thrombolytic drugs may contain a small percentage of albumin.
- ◆ **Immune globulins:** Various protein preparations of antibodies. They are a sterilized solution used to prevent and sometimes treat infectious diseases. They provide immunity (increase resistance) to a range of common infectious diseases. They work by passing on antibodies obtained from the blood of large numbers of people previously exposed to these diseases and who have subsequently developed antibodies to them.
- ◆ **Topical Procoagulants (e.g., Tisseel, fibrin glue, thrombin):** Products that are derived from human or animal blood plasma used for hemostasis (slowing or stoppage of the flow of blood). They are usually applied intra-operatively to tissue, organs, and blood veins/vessels. (NOTE: There is a very small but potential risk that these products may transmit infectious agents/diseases. Please discuss these risks with your physician.)
- ◆ **Plasma Protein Fractions (Cryoprecipitate):** A human blood fraction that is obtained from fresh frozen plasma. When FFP is thawed in the cold, a precipitate forms that is rich in blood clotting factors such as fibrinogen, Factor VIII, von Willebrand factor, Factor XIII and fibronectin. NOTE: There is a very small but potential risk that these products may transmit infectious agents/diseases. Please discuss these risks with your physician.)
- ◆ **Recombinant Clotting Factors:** Genetically engineered coagulation factors designed to promote hemostasis (slowing or stoppage of the flow of blood). These products may or may not contain albumin.
- ◆ **Platelet Gel:** An autologous (meaning “made from your own blood”) product used during a surgical procedure. It is intended to seal wounds and reduce bleeding. Some blood is withdrawn and concentrated into a solution rich in platelets and white cells. This solution is then applied on surgical sites or wounds. NOTE: In some formulations, a clotting factor taken from cow’s blood is used.

- ◆ **Epidural Blood Patch:** Used to stop spinal fluid leakage. A small amount (5-10 ml) of the patient's blood is removed by venipuncture and injected into the membrane surrounding the spinal cord at the same level of the previous spinal puncture. It is used to seal a puncture site that is leaking spinal fluid.
- ◆ **Tagging Studies:** Used to diagnose or treat illness, i.e. bleeding or infection. Some blood is withdrawn or removed (approximately 50 ml) via venipuncture and then mixed or "tagged" with nuclear medicine. Afterwards, about 3 ml of the patient's tagged blood is returned to the patient. The length of time one's blood is outside the body may vary.
- ◆ **Dialysis:** Functions as an organ. Hemodialysis is used when a patient's kidneys can no longer filter waste products from the blood. In hemodialysis, blood circulates through a machine that filters and cleans it before returning it to the patient. The blood flows continuously and is in a closed circuit.
- ◆ **Heart Lung Equipment (Cardiopulmonary Bypass):** Blood is diverted to an artificial heart-lung machine via the placement of a large cannula in the right atrium of the heart. The blood is then oxygenated and directed back into the patient.
- ◆ **Intraoperative Blood Salvage (Cell Saver®):** Designed to reduce blood loss. Blood that is shed into the surgical field is recovered, washed, filtered and then using a closed circuit, perhaps in a continuous process, returned to the patient. The blood is separated by means of centrifuge and only the red blood cells are returned to the patient.
- ◆ **Hemodilution:** Reduces blood loss. During surgery, blood is diverted to bags and replaced with a non-blood volume expander (crystalloids or colloids) to maintain normal intravascular volume. The blood remaining in the patient during surgery is therefore diluted, containing fewer red blood cells. During or at the end of surgery, the diverted blood is returned to the patient.
- ◆ **Plasmapheresis:** A procedure that consists of the removal of blood, separation of blood cells from plasma, and return of these blood cells to the body's circulation. Some physicians may want to use fresh frozen plasma but a plasma substitute can be added instead. This is a continuous, closed circuit system.

If you would like additional information about our Transfusion-Free Medicine Program, please contact our Program Director at 323.442.5263.