

## Transfusion-Free Stem Cell Transplantation for Hematologic Cancers

Physicians at the Penn Center for Transfusion-Free Medicine are performing transfusion-free autologous stem cell transplants for patients with non-Hodgkin's lymphoma, Hodgkin's lymphoma, and multiple myeloma.

Located at Pennsylvania Hospital, the Center for Transfusion-Free Medicine performed the first transfusion-free stem cell transplant, and has treated more patients seeking transfusion-free transplants than any center of its kind in the world.

Transfusion-free surgery and medicine are the only options for patients whose religious or personal beliefs prohibit them from receiving blood transfusions or blood products, and are an option for patients with reservations about blood-borne complications.

At Pennsylvania Hospital, the transfusion-free approach to surgery employs a combination of diet management and medications prior to surgery to increase the levels of iron and hemoglobin in the blood, and intraoperative anesthesia techniques and surgical and practical methods designed to minimize blood loss and conserve blood levels.

The potential advantages of transfusion-free procedures include faster recovery, shorter hospital stays, reduced blood loss, and elimination of the risk of blood contamination. In consideration of the needs of patients and their families to be close to Pennsylvania Hospital during the transplantation period, the Transfusion-Free Stem Cell Transplantation Program offers constant staff support to assist with accommodations, transportation, and other daily necessities for patients.

### CASE STUDY

Mr. J, a 56-year-old male, was treated at a community hospital following a diagnosis of stage 4A diffuse large cell non-Hodgkin's lymphoma. There, a six-cycle regimen of cyclophosphamide + doxorubicin + vincristine + prednisone (CHOP) + rituximab was followed by complete remission.

When a chest X-ray at the same hospital demonstrated lymphadenopathy two years later, an indication of disease return, Mr. J began salvage chemotherapy with ifosfamide, carboplatin and etoposide (ICE) + rituximab.

In anticipation of an autologous stem cell transplant, a local bone marrow transplant center was then approached. The center agreed that stem cell transplantation was the best option for Mr. J's survival, but declined to treat him when he refused to have a blood transfusion. Mr. J was then referred to the Center for Transfusion-Free Medicine at Pennsylvania Hospital.

Following a full day evaluation for eligibility testing at Penn, and upon demonstrating good organ function, Mr. J was scheduled for stem cell uptake. During this procedure, an apheresis catheter was placed and cytokine mobilization of hematopoietic stem cells initiated with a target of  $4.0 \times 10^6$  to the 6th CD34 cells per kilogram.

This was followed by admission to the hospital, where he underwent high dose busulfan, cyclophosphamide, and etoposide (BCV) therapy. During the next two weeks, Mr. J had profound pancytopenia complicated by neutropenic fever, which was treated with IV antibiotics. He also experienced moderate GI toxicity manifesting as diarrhea and mucositis.

Mr. J received pre-transplant iron and growth factors to attain a baseline hemoglobin of 12. Iatrogenic blood loss was minimized by restricting phlebotomy. Nadir 6 hemoglobin was associated with hypotension requiring one day in a monitored setting where he received volume support and cardiac monitoring to assure adequate tissue oxygenation.

Mr. J's platelet count remained under 10K for 4 days during which period he was supported with prophylactic vitamin K and aminocaproic acid (Amicar) and interleukin 11 to stimulate platelets to grow. No bleeding episodes occurred. Partial cell engraftment occurred on day 12 and Mr. J was discharged back to the referring oncologist 16 days after his transplant. He has remained in remission for two years.

### FACULTY TEAM

The Center for Transfusion-Free Medicine at Pennsylvania Hospital is staffed by highly skilled specialists and surgeons trained in techniques for transfusion-free medical management and surgery. The Center's coordinators, nurses, pastoral counselors and volunteers have expertise in non-blood management and are always sensitive to patient's religious or personal beliefs regarding transfusion-free medicine and treatment.



#### Performing Transfusion-Free Stem Cell Transplantation at Penn Medicine

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*Director, Center for Transfusion-Free Medicine,  
Clinical Professor of Medicine*

#### Transfusion-Free Stem Cell Transplantation Staff

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#### Penn Hematology Oncology at Pennsylvania Hospital

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## Transfusion-Free Heart Surgery Now Available at Penn Medicine Chester County Hospital



At Chester County Hospital, Satoshi Furukawa, MD, is now performing heart surgeries that do not involve blood transfusion or blood products.

Last spring, Chester County Hospital began offering transfusionless heart surgery in cooperation with the Center for Transfusion-Free Medicine at Pennsylvania Hospital to help meet growing demand in the Greater Philadelphia region.

**Satoshi Furukawa, MD**, Chief of Cardiovascular Surgery at Pennsylvania Hospital, and one of the premier transfusionless heart surgeons in the country, performs all transfusionless heart surgeries at Chester County Hospital. Patients will receive all other services, including outpatient diagnostic and therapeutic anemia correction, at Pennsylvania Hospital.

[Read about the transfusionless heart surgery program at Chester County Hospital](#)

### ACCESS

**Penn Hematology Oncology at Pennsylvania Hospital**

**Abramson Cancer Center at Pennsylvania Hospital**

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To refer a patient and/or consult with a physician, call 215.829.6088 to reach our Pennsylvania Hospital location.

### ADDITIONAL RESOURCES FROM THE CENTER FOR TRANSFUSION-FREE MEDICINE

[Listen to an Interview](#) with Dr. Ford on bloodless medicine

[Read an Article](#) about transfusion-free stem-cell transplantation at Penn Medicine

[Read the newsletter](#) of the Center for Transfusion-Free Medicine