

The Center for  
**BLOODLESS MEDICINE & Surgery**  
at Pennsylvania Hospital

REACHING A  
**MILESTONE**



**Bloodless Stem Cell Transplant  
Program Treats 100<sup>th</sup> Patient**

The Center for Bloodless Medicine and Surgery (CBMS) at Pennsylvania Hospital receives frequent recognition as the premiere interdisciplinary and fully coordinated transfusion-free program for patients who prefer medical treatment without the use of blood product support. Under the direction of CBMS founder and medical director, Patricia Ford, MD, the Center is often cited as the model program by health care professionals and organizations throughout the country and the world. Dr. Ford and her team established CBMS in 1996 to treat Jehovah's Witness patients and others who do not accept blood transfusions for religious or personal reasons. CBMS has evolved into a major transfusion-free treatment center, caring for more than 600 patients per year.

In 2011, CBMS reached a major milestone. The Center's Bloodless Stem Cell Transplant Program treated its 100<sup>th</sup> patient by safely using high dose chemotherapy (HDC) followed by autologous stem cell transplant (ASCT) without the use of transfusion support (see medical explanation on page 2). Dr. Ford performed the world's first bloodless stem cell transplant more than 15 years ago. In this edition of the newsletter, two patients share their success stories as the 99<sup>th</sup> and 100<sup>th</sup> patients in the program to undergo successful bloodless autologous stem cell transplants.

**Meet Jock Davis**  
PATIENT 100

Jock Davis of Rochester, NY, underwent a successful bloodless stem cell transplant at Pennsylvania Hospital in January 2011. He is the program's 100<sup>th</sup> patient. Read his story on page 3.

*"When I arrived at Pennsylvania Hospital and the CBMS team met with my wife and me, any apprehension we had quickly went away."*

**Meet Nathan Zink**  
PATIENT 99

Nathan Zink of Greenfield, WI, traveled to Philadelphia for bloodless stem cell transplant treatment at Pennsylvania Hospital during the winter of 2010. He is the program's 99<sup>th</sup> patient. Read his story on page 4.

*"The CBMS team is so personable and professional. They really care for you."*



## MEDICAL EXPLANATION

### What is a Bloodless Autologous Stem Cell Transplant?

Healthy bone marrow is a soft and spongy material inside the bones that contain stem cells. Stem cells carry oxygen through the body, fight infection, help the blood to clot and prevent bleeding. When diseases such as multiple myeloma, non-Hodgkin lymphoma or other cancer-related conditions attack the bone marrow, stem cell transplants may be used as treatment and have contributed to better survival rates in patients.

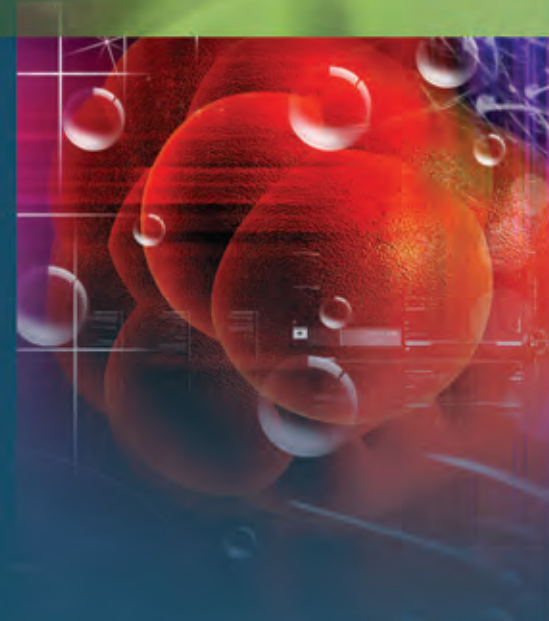
Autologous stem cell transplant (or commonly called a bone marrow transplant) means that a patient's own stem cells are taken from their bone marrow or blood, collected and reinfused. Chemotherapy and radiation destroy the diseased cells in the bone marrow and the infused stem cells eventually turn into healthy red blood cells, white blood cells or platelets. However, high-dose chemotherapy can cause severe anemia, a condition where someone has abnormally low red blood cells or lacks hemoglobin in the blood. Chemotherapy can also cause bleeding from thrombocytopenia, or low platelet counts that prevent clotting. Blood transfusions are used in most stem cell transplants to combat these complications. Many patients bank their own blood in advance of the procedure to reinfuse later. They may receive between five and 20 blood transfusions of red blood cells or platelets until the body can start producing the healthy cells on its own.

Conversely, Jehovah's Witnesses and other patients who prefer transfusion-free methods will not accept transfusions of blood or blood products, including red cells, white cells, plasma and platelets. At the Center for

Bloodless Medicine and Surgery (CBMS), bloodless stem cell transplants use different treatment approaches to avoid any use of blood or blood product support. Patients are closely monitored prior to transplant with a combination of diet management and medications to increase the levels of iron and hemoglobin in the blood. During the transplant procedure, surgical methods designed to minimize blood loss and conserve blood levels are also used.

Medical director Dr. Patricia Ford and the CBMS team identify four major changes to address transfusion-free stem cell transplant including:

- Harvesting blood stem cells using albumin (a protein found in blood plasma) and normal saline in place of fresh frozen plasma. After reinfusion, the apheresis catheter is promptly removed. Apheresis is a procedure in which blood is drawn and separated into components, some of which are retained, and the remainder is returned to the patient.
- Avoiding additional blood loss by minimizing blood draws and using pediatric phlebotomy tubes.
- Preparing for the decline in hemoglobin by optimizing levels with intravenous iron and erythropoietin prior to transplant. Erythropoietin is a type of hormone used to treat anemia. It stimulates bone marrow to increase production of red blood cells. The transplant procedure may be delayed until certain hemoglobin levels are reached.
- Using various drug regimens to prevent bleeding when platelet counts will be abnormally low.



Examples of bloodless treatment plans may include:

- Administering various growth proteins to stimulate bone marrow to produce stem cells and improve platelet recovery.
- Using stool softeners and drugs to reduce gastric acid production.
- Supplementing vitamin intake to include vitamins C and B-complex, folate and vitamin K, as needed.
- Stopping menstruation temporarily in female patients.
- Adjusting cardiac medications.
- Managing anemia.
- Providing oxygen, as needed.
- Omitting all use of anticoagulants and aspirin.

Dr. Ford's team reports that 100 patients treated through the bloodless autologous stem cell transplant program had a 96 percent survival rate. The mortality rate of 4 percent is similar to the national mortality rate for lymphoma and multiple myeloma. Most blood management strategies are applicable to all stem cell transplant patients and could be applied to a wider range of patients.

# 100<sup>TH</sup> PATIENT *Receives Bloodless Stem Cell Transplant at Pennsylvania Hospital*

Jock Davis, 49, experienced his “15 minutes of fame” in Philadelphia in a unique way. Mr. Davis is the 100th person to receive a bloodless stem cell transplant at Pennsylvania Hospital – the most successful program of its kind in the world.

The Philadelphia news media visited him at Pennsylvania Hospital in preparation for the procedure.

“The television and newspaper reporters came to interview me,” he said, “and I was really glad to discuss it because it will help others to find Dr. Ford and her program. My wife found this bloodless stem cell transplant program by doing research on the Internet. The publicity about my treatment will help other people in the same situation.”

Mr. Davis described himself as a “healthy guy,” before his medical problems started two years ago. “I went from walking around doing normal things to finding myself in kidney failure with a diagnosis of multiple myeloma.” A pain in his right hip and some stomach problems were the first indicators that something was wrong. “I couldn’t figure out what was causing these symptoms. My primary physician did a blood test and discovered that my kidneys were failing. They were only functioning at 5 percent,” he explained.

After being admitted to a local hospital, an oncologist quickly diagnosed him with multiple myeloma, a form of cancer that begins in plasma cells, a type of white blood cell and part of the immune system.

Myeloma cells collect in the bone marrow and in the solid parts of bone. A common symptom of multiple myeloma includes bone pain, particularly in the back, pelvis or ribs. Treatment to control symptoms and complications includes chemotherapy, radiation and stem cell transplantation – almost always with blood transfusion support.

For several months, Mr. Davis underwent aggressive treatment for the cancer with chemotherapy and dialysis to correct the kidney failure. “My whole life was suddenly consumed with dealing with this illness,” he noted, adding that he became severely limited on what he could physically do while he was sick. He is a business executive who owns an outsourcing company and he frequently travels throughout the United States and China. He and his wife, Naomi, have two children, Jacob, 11 and Kenya, 20. “It was a good day if I could sit with my son and play a game of Uno,” he said.

In time, his kidneys rebounded enough to stop the dialysis. In addition, the chemotherapy helped to control the cancer, but his blood count levels remained extremely low. “I had no energy, and a limited quality of life,” he said.

After doing extensive research on stem cell transplants, Mr. Davis decided to pursue this option. “I clearly understood that multiple myeloma is not curable, but it is treatable and manageable. Stem cell transplantation gave me the best opportunity to get some semblance of normalcy back into my life.” (See medical explanation page 2.)

Many medical facilities throughout the country perform stem cell transplants, but most physicians will only perform the procedure using blood transfusions. “Blood transfusions are not an option for me,” noted Mr. Davis, a Jehovah’s Witness who does not accept blood transfusions due to religious beliefs. “I got a lukewarm response, at best, from different physicians when I asked if stem cell transplant could be done without the use of blood,” he explained. “I knew bloodless stem cell transplants were possible, but I couldn’t find anyone to do it without transfusions.”

After reading articles online about Dr. Ford’s work, he contacted CBMS. “At that point Dr. Ford had performed the procedure on more than 90 patients, so I knew it could be done,” he said.

He met with Dr. Ford and the CBMS team and started preparations to undergo stem cell transplant. “I was in the hospital for 13 days. I didn’t have any complications from the procedure, just a slight fever for a short time. When you go through these injections, basically your entire white and red blood counts are wiped out, but my body responded really well and the cells started regenerating. My overall experience was great considering what I had to go through. And the CBMS and nursing staff were exceptional. They had a great bedside manner and were so supportive,” he said.

After his condition improved, Mr. Davis was released into the care of his local oncologist in New York. “My recovery is going well,” he noted. “I’m not 100 percent yet, but I’m at a point where I go for walks, play with my son and spend time with my family. I am vastly better, considering that at one point I spent most of my time in bed. I get up, go outside and enjoy people again. I am so grateful to Dr. Ford and the Center for Bloodless Medicine and Surgery,” he added.



**TO WATCH MR. DAVIS’ INTERVIEW** on Channel6 ABC

Health Check, visit the CBMS website “In the News” section at [PennMedicine.org/bloodless](http://PennMedicine.org/bloodless).

# Successful Bloodless Stem Cell Transplant Treats Non-Hodgkin Lymphoma

Nathan Zink, of suburban Milwaukee, was diagnosed with stage IV non-Hodgkin lymphoma, called mantle cell, several months after having back surgery. “The type of non-Hodgkin lymphoma that I have is rare for people under age 50,” explained Mr. Zink, 35, who was formerly self-employed as a contractor and home remodeler. He had back surgery two years ago after accidentally falling from a roof.

“After the back surgery, I never fully recovered,” he recalled. “My wife became concerned because I was losing weight. I was down to 146 pounds and I usually weigh about 175. The doctors did more tests and that’s when I was diagnosed.”

Common symptoms of non-Hodgkin lymphoma include weight loss and enlarged lymph nodes. In Mr. Zink’s case, the lymphoma had spread to the lymph nodes near his groin, armpits and neck areas.

According to the National Cancer Institute, mantle cell lymphoma is an aggressive or fast-growing type of B-cell non-Hodgkin lymphoma that usually occurs in middle-aged or older adults. It is marked by small- to medium-size cancer cells that may be in the lymph nodes, spleen, bone marrow, blood and gastrointestinal system.

Mr. Zink underwent chemotherapy and started researching his options for bloodless stem cell transplant. He does not accept blood transfusions for religious reasons. “Although there are numerous state-of-the-art medical facilities in the Milwaukee area that perform stem cell transplants, most aren’t willing to take on bloodless patients,” he said.

He finally found a hospital and a physician that agreed to perform the procedure, but he encountered more roadblocks with health insurance. “I had stem cell apheresis done in Wisconsin and I was ready to go. But we couldn’t do it because of insurance complications. I was left with no options. It was very stressful, but luckily we found Dr. Ford and CBMS,” he said.

Nathan and his wife, Heidi, were aware of the CBMS program from doing research on bloodless stem cell transplant programs. The

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“I think that a bloodless stem cell transplant is something that doctors and hospitals should definitely have as an option for patients requiring bloodless procedures.”

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Zinks, who have two daughters, Natalie, 13, and Emily, 11, traveled to Philadelphia for the initial consultation. “The CBMS team worked so fast and coordinated my case so quickly,”

## PATIENT 99 Nathan Zink



he said. “Everyone was so professional and confident about the bloodless methods.”

He spent five weeks in Philadelphia for the entire procedure. “I had high dose chemotherapy for one week prior to the transplant. I spent about four weeks in the hospital and another week in a nearby hotel during the process. I had no complications or infections. I didn’t feel isolated, I was comfortable and I could have visitors. It went much better than I ever expected.”

He returned to Wisconsin under the care of his local oncologist and primary care physicians.

Today, Mr. Zink is in remission. He returned to school for training to become an echocardiogram technician. His positive experience with CBMS also motivated him to educate others about bloodless stem cell transplants.

“I’ve spoken with some doctors and staff at hospitals in Wisconsin to see if this procedure could be done here for patients like me. The procedure that Dr. Ford performed really wasn’t that complicated. She made adjustments to some medications and a few other processes to make it into a bloodless transplant. I think that a bloodless stem cell transplant is something that doctors and hospitals should definitely have as an option for patients requiring bloodless procedures,” Mr. Zink said.

**Patients who travel a distance for bloodless stem cell transplants at Pennsylvania Hospital** have resources available to them for assistance with lodging, transportation and meals. For more information, contact the CBMS office or visit [PennMedicine.org/bloodless](http://PennMedicine.org/bloodless) to review the “Frequently Asked Questions” section about staying in or near Philadelphia during the treatment.



## Q & A with Patricia Ford, MD

### World's Leading Bloodless Stem Cell Transplant Specialist

Patricia A. Ford, MD, is a hematologist/oncologist and anemia specialist who pioneered bloodless stem cell transplant procedures. She serves as director of the Peripheral Stem Cell Transplant Program and medical director for the Center for Bloodless Medicine and Surgery at Pennsylvania Hospital. In January 2011, Dr. Ford performed the 100<sup>th</sup> bloodless stem cell transplant — more than any other physician worldwide.

#### **Q. Why are health care professionals unaware that stem cell transplants can be performed without blood transfusion support?**

A. It's actually not unusual for patients to be told that it is not possible to have a stem cell transplant without transfusions. Many physicians have never had the opportunity to treat Jehovah's Witness patients or patients who do not accept blood transfusions. At CBMS, we see 600 to 700 Jehovah's Witness patients every year for all types of medical conditions and reasons. Often patients are referred or transferred here by outside physicians who are uncomfortable or unfamiliar with bloodless procedures.

#### **Q. How did you develop and apply bloodless methods for stem cell transplants?**

A. We have simplified strategies put into place for bloodless stem cell transplant procedures. I took all of the strategies that I learned throughout the years working with surgical, medical and oncology patients and put them together to devise a simple protocol for stem cell transplants. For example, I took the surgical concept of building up blood counts before surgery for procedures that have a lot of blood loss. With transplants, patients normally do not lose blood but they have low blood counts from the high-dose chemotherapy. So, I build their blood counts up before the transfusion. That's completely different

than what a high-level transfusion center would do. They wait until patients have a low blood count and then administer blood transfusions.

For patients experiencing low platelet counts, we're frequently dealing with patients who are bleeding. I've learned what pharmacologic or hemostatic agents help with blood clotting when we're dealing with low platelet counts. In addition, we've learned that a big source of blood loss in hospitalized patients is the amount and frequency of blood draws. Often patients have blood drawn repeatedly every day and that is probably not necessary. We can conserve blood by limiting blood draws, and that applies to all patients in all hospitals.

#### **Q. Bloodless programs are becoming more mainstream as evidenced by the news media starting to take interest. Do you think programs like CBMS will become more commonplace in hospitals across the country?**

A. It's very challenging to change hospitals and physicians' practices until a bloodless program like ours is brought into an institute. Once doctors care for patients who do not accept blood transfusions, they recognize that these strategies are effective and applicable to all patients. But, to get a program started, a physician or nurse has to become the champion for it. However, the

Joint Commission, which accredits health care facilities, is actually looking into instituting blood conservation measures to put into place in every hospital across the country. So, it is on that organization's radar too.

A lot of techniques and strategies we use are good for all hospitals and all patients. It just requires education and a willingness of physicians, nurses and other health care providers to learn and apply these techniques.

#### **About Dr. Ford**

Dr. Patricia Ford earned her medical degree from the University of Miami. She completed her residency at Graduate Hospital in Philadelphia and fellowship training at Fox Chase Cancer Center and Temple University Hospital. Dr. Ford is board certified in hematology/oncology. She is a member of the American College of Physicians, the American Society of Hematology and the American Society of Clinical Oncology.

Dr. Ford co-founded the Society for the Advancement of Blood Management, an organization dedicated to improving patient outcomes through optimal blood management practices.

To schedule an appointment with Dr. Ford, call **800.789.PENN (7366)** or visit **PennMedicine.org** to schedule online.

# COPING WITH *Leukemia*

A diagnosis of leukemia can be frightening and confusing. Leukemia is a form of blood cancer that begins in the bone marrow. Leukemia actually means “white blood.” White blood cells (leukocytes) are made in bone marrow and used by the body to fight infections and other foreign substances. There are different forms of leukemia that lead to an uncontrolled increase in the number of white blood cells.

The cancerous cells prevent healthy red cells, platelets and mature white cells (leukocytes) from forming. Life-threatening symptoms can develop if it spreads to the bloodstream, lymph nodes, brain, central nervous system or other parts of the body.

Chronic leukemia grows slowly and acute leukemia grows rapidly. Some leukemias are curable and other types are difficult to cure, but can be controlled. Treatments may include chemotherapy, radiation and stem cell transplantation.

The Center for Bloodless Medicine and Surgery at Pennsylvania Hospital and the Penn Cancer Network offer many resources for patients and families to learn about leukemia and related diseases. Visit [PennMedicine.org](http://PennMedicine.org) to access Penn Medicine’s health information library and encyclopedia articles that cover topics related to leukemia.

In addition, the National Cancer Institute at the National Institutes of Health ([www.cancer.gov](http://www.cancer.gov)) and The Leukemia & Lymphoma Society ([www.lls.org](http://www.lls.org)) provide a wealth of information on all phases of the disease — from the initial diagnosis and treatment to managing quality of life issues, accessing support groups and long-term health planning.



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