

NIH News in Health

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Organ Donation: Pass it On Give a Gift of Life

A gift with a major impact—one that will long be remembered with gratitude—takes just a bit of preparation. When you become an **organ donor**, you can save the lives of up to 8 people. And if you donate tissues like blood cells, bone or corneas, you can help even more.

Organ transplantation was once considered an experimental procedure with a low success rate. Many transplanted organs survived just a few days or weeks. But researchers have transformed transplant surgery from risky to routine. It's now the treatment of choice for patients with **end-stage organ disease**. Each day, about 80 Americans receive a lifesaving organ transplant.

"The outcomes of transplantation are really so good these days that it truly makes a difference for the people who receive organ transplants," says Dr. Sandy Feng, a transplant surgeon at the University of California, San Francisco. "The organs are clearly lifesaving."

The problem now is that there aren't enough organs to meet the demand. In early 2011, more than 110,000 people were on the nationwide waiting list for an organ. An average of nearly 20 of them dies each day while waiting.

The kidney is the most commonly transplanted organ. More than 16,000 kidney transplantations were performed in the U.S. last year. The wait, though, can be long. In February 2011, nearly 90,000 people were on the national waiting list for a kidney. Next most commonly trans-

planted is the liver, with more than 6,000 surgeries in 2010. That's followed by the heart, lungs, pancreas and intestines.

You can donate some organs—like a kidney or part of your liver—while you're still alive. You have 2 kidneys but really need only one. And the liver can re-grow if

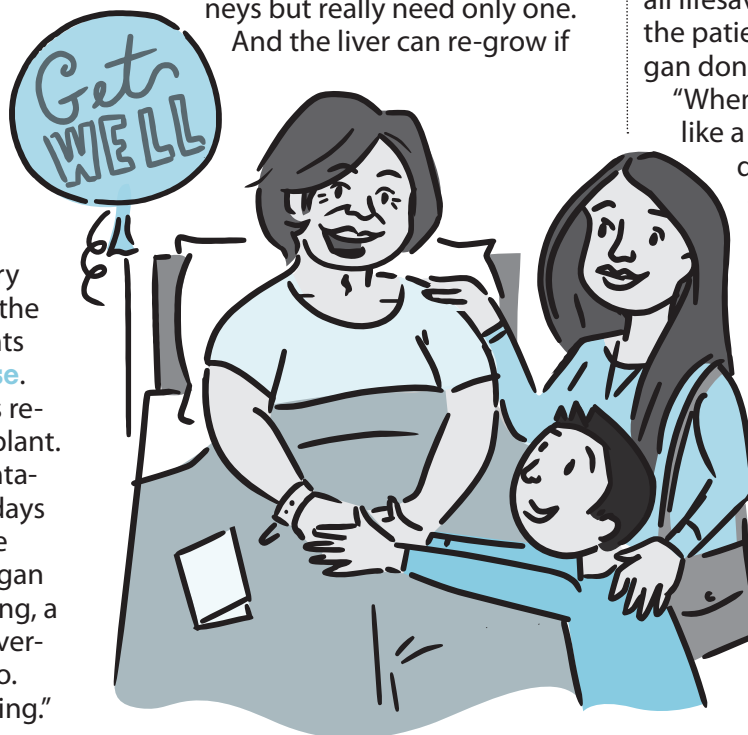
part of it is removed. But donating these organs requires major surgery, which carries risks. That's why living donors are often family or friends of the transplant recipient.

Most organs, though, are donated after the donor has died. The organs must be recovered quickly after death to be usable. Many come from patients who've been hospitalized following an accident or stroke. Once all lifesaving efforts have failed and the patient is declared dead, then organ donation becomes a possibility.

"When a person dies, it can feel like a burden to a family to make decisions about organ donation," says Feng. "So it would be a real gift to a family to indicate your decision to be an organ donor while you're still alive, so they don't have to make the decision for you."

In addition to organs, you can donate tissues. One of the most commonly transplanted tissues is the cornea, the transparent covering over the eye. A transplanted cornea can restore sight to someone blinded by an accident, infection or disease. Donated skin tissue can be used as grafts for burn victims or for reconstruction after surgery. Donated bones can replace cancerous bones and help prevent amputation of an arm or leg. Donated veins can be

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Definitions

Organ

A system of cells and tissues that perform specific tasks, such as pumping blood (heart), breathing (lungs) or removing waste from the blood (kidney).

End-Stage Organ Disease

A disease that ultimately leads to permanent and complete failure of an organ.

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used in cardiac bypass surgery.

NIH-funded scientists are exploring a variety of ways to improve organ transplantation. The biggest problem is that when an organ from one person is transplanted to another, the recipient's immune system attacks the implant as though it's a disease-causing microbe.

"We'd hit a home run if we could find a way to re-educate a person's immune system so that it continues to fight infection just as effectively as ever but it didn't recognize a transplanted organ as foreign. That's called transplantation tolerance,"



Wise Choices Become an Organ Donor

- Sign up as an organ and tissue donor in your state's donor registry. Go to: www.organdonor.gov/stateMap.asp.
- Show your choice on your driver's license. Do this when you obtain or renew your license.
- Tell your family about your donation decision. Even if you've signed up, your family is consulted before organ donation.
- Tell your physician, faith leader and friends.
- Prepare and sign a living will and an advance care directive. These legal documents can clarify your choice as an organ donor.

says Dr. Nancy Bridges, chief of the transplantation immunology branch at NIH.

To prevent organ rejection, recipients must take drugs, called immunosuppressants, usually for the rest of their lives. "Immunosuppressant drugs have revolutionized our ability to do organ transplantation over the last 30 years," says Dr. Jerry Nepom, who heads an NIH-funded program called the Immune Tolerance Network. "But those 3 decades have also taught us that these immunosuppressants are not very selective, which is a big problem."

Immunosuppressants knock down the entire immune system, so that the body has trouble fighting off infections. The drugs also boost the risk for cancer, especially skin cancer. In addition, over time, these potent drugs can damage the kidneys and raise the risk for diabetes, high blood pressure and cardiovascular disease.

"These medications are sort of a necessary evil. You can't live without them, because you might reject your organ. But it's difficult to live with them because they cause side effects that need to be managed," says Feng.

If a patient stops taking immunosuppressants, the transplanted organ nearly always fails. But in very rare cases, people can go off their medications. Last year, NIH-funded scientists spotted a pattern of gene activity in patients who had successfully stopped taking their immunosuppressants after a kidney transplant. Other researchers are testing whether certain liver transplant patients could



Web Links

For more about organ donation and transplantation, see our links online:

<http://newsinhealth.nih.gov/issue/Mar2011/Feature1>

be weaned off their medications.

"Ultimately, it would be valuable if we could do a blood test to predict who could stop taking their drugs or maybe be on a lower dose," says Bridges. "We have evidence that it might be possible, but we're not there yet."

In other studies, Nepom says, "we're exploring how to get the recipient's immune system in a receptive mode, so that it doesn't become excited and angry when a transplanted organ comes into the body." In one small clinical study, researchers gave a kidney recipient some of the donor's bone marrow before surgery. Bone marrow produces cells that fight infection. The procedure created a hybrid immune system in the recipients that better tolerated the transplants. A few patients were able to go off their immunosuppressants within a year after surgery.

While some scientists continue to improve current methods, others are exploring completely new ideas. One cutting-edge approach is to create artificial transplants that won't trigger an immune system attack. Although years of research will be needed to apply these emerging techniques, researchers have made progress toward engineering livers, lungs and other organs.

You can help reduce the need for donated organs in the first place by living well. Lower your risk of developing a long-term disease that could lead to organ failure by being physically active and eating a healthy diet rich with high-fiber foods, fruits and vegetables. Talk to your doctor about your weight, blood pressure and cholesterol. And while you're taking these healthy steps, be sure to sign up to be an organ donor so you can help others as well. ■

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The Mystery of Multiple Sclerosis

No Simple Explanation

Multiple sclerosis (MS) disrupts communication between the brain and other parts of the body. In the worst cases, it can bring partial or complete paralysis. Researchers don't yet know what causes this disease or how to cure it, but they've been making progress on both fronts.

Symptoms of MS arise most often between the ages of 20 and 40. It often begins with blurred or double vision, color distortion, or even blindness in one eye. It can cause muscle weakness, vision loss, numbness or tingling, and difficulty with coordination and balance. MS can bring many other symptoms as well.

In some people, doctors may not be able to readily identify the cause of these symptoms. Patients may endure years of uncertainty and multiple diagnoses while baffling symptoms come and go. The vast majority of patients are mildly affected, but in the worst cases, MS can leave a person unable to write, speak or walk.

MS is a disease in which the body's **immune system** inappropriately attacks the brain and spinal cord. Specifically, the immune system targets the fatty insulating material around nerves called myelin. When myelin is damaged, the messages that nerve cells send and receive can be interrupted.

Definitions

Immune System

The system that protects your body from invading viruses, bacteria and other microscopic threats.

Genes

Stretches of DNA, a substance you inherit from your parents, that define characteristics such as how likely you are to get certain diseases.

Researchers estimate that 250,000 to 350,000 people in the United States have been diagnosed with MS. Scientists don't yet understand what triggers the immune system to attack myelin in these people. But researchers do know that whites are more than twice as likely as others to develop MS, and women almost twice as likely as men.

Geography seems to play a role in MS. The disease is much more prevalent in temperate climates than in tropical regions. Your risk for MS seems to depend on where you live before the age of 15. Some studies have found that a person who moves before the age of 15 tends to adopt the risk of the new area. People moving after age 15 seem to maintain the risk level of the area where they grew up. Some researchers believe that vitamin D, which the body makes when sunlight strikes the skin, may lower the risk of MS and help explain these findings, but studies haven't yet confirmed this link.

Some microbes, such as the Epstein-Barr virus, have been suspected of causing MS. But researchers haven't been able to prove for certain that any microbes raise your chances of getting MS. Cigarette smoking, however, does appear to raise your risk.

Genes clearly affect how likely you are to develop MS. Having a sibling with MS raises your risk of getting MS to about 4% to 5%;



having an identical twin raises your risk to about 25% to 30%. These facts suggest a strong genetic component to MS. However, although some studies have linked specific genes to MS, most of the results haven't been definitive. Researchers are now working on more detailed studies.

There's no cure yet for MS, but various therapies can treat it. Researchers are continuing to develop new and better therapies for MS, with several now in the pipeline. ■

Web Links

For more about multiple sclerosis, see our links online:
<http://newsinhealth.nih.gov/issue/Mar2011/Feature2>



Wise Choices Signs and Symptoms of MS

- Muscle weakness
- Blurred or distorted vision
- Numbness or tingling
- Coordination problems
- Speech disturbances
- Vertigo or dizziness
- Trouble concentrating
- Fatigue
- Tremor



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Mar2011/Capsule1>

Antidepressant Reduces Hot Flashes

Hot flashes are among the most bothersome symptoms for women during menopause. A new study reports that an antidepressant drug may reduce the number and severity of hot flashes.

The main treatment for hot flashes has long been menopausal hormone therapy. But the therapy has been shown in some women to raise the risk of heart disease, stroke, blood clots and breast cancer. The U.S. Food and Drug Administration recommends that hormone therapy be used for the shortest time and at the lowest dose that relieves symptoms.

To look at other options, an NIH-funded clinical trial enrolled more than 200 healthy perimenopausal or postmenopausal women. About half were given a daily dose of the antidepressant drug escitalopram.

The others received an inactive pill, or placebo.

After 4 weeks, women taking escitalopram had an average of 44% fewer hot flashes. In comparison, women taking the placebo had an average of 26% fewer hot flashes.

Escitalopram treatment led to further reductions in hot flashes after 8 weeks. Women taking the drug also reported that their hot flashes became less severe and bothersome. Most said they were satisfied with the treatment. They reported few negative side effects.

It's not clear exactly how antidepressants like escitalopram help to relieve hot flashes. Still, the findings suggest that these drugs might be a safe alternative to menopausal hormone therapy. ■

School Guide Teaches ABCs of Diabetes

School-age children with diabetes face unique challenges. They may be vulnerable to serious swings in their blood glucose levels at any time. A newly updated booklet, "Helping the Student with Diabetes Succeed: A Guide for School Personnel," can help.



Definitions

Glucose

A type of sugar used by the body for energy. When the glucose level in the blood gets too high, it can damage tissues and organs.

The guide offers suggestions for parents, teachers, principals and others to ensure the safety of these kids.

Diabetes is one of the most common long-term diseases in school-age children. It affects about 200,000 young people nationwide. Most students with diabetes must carefully monitor and control their blood glucose throughout the day. A severe drop in glucose levels can be life-threatening.

The guide urges parents to notify school officials that a child has diabetes. Parents are encouraged to partner with the child's health care



Featured Web Site Healthy Eyes

www.nei.nih.gov/healthyeyes

Each year millions of people have problems with their eyes. Get science-based tools and tips for keeping your eyes healthy. Learn about eye exams, low vision, glaucoma and diabetic eye disease. Take online quizzes and send free e-cards to your friends. The site is available in English and Spanish.

team to develop a diabetes medical management plan. The guide recommends that parents give permission for medical information to be shared by the school and health care team.

"Unfortunately, the need to manage diabetes doesn't go away at school," says Dr. Griffin P. Rodgers, director of NIH's National Institute of Diabetes and Digestive and Kidney Diseases. "The guide, quite literally, can be a lifesaver."

To view, download or order a free copy of the guide, go to www.YourDiabetesInfo.org/schoolguide, or call the National Diabetes Education Program at 1-888-693-6337. ■

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