

look like the donor," says John Barker, director of plastic-surgery research at the University of Louisville. Unlike skin from other parts of the body, facial tissue is uniquely thin and pliable, which makes it easier to stretch around the eyeballs and mouth. As a result, face-transplant recipients shouldn't need to undergo so many operations to try to get a less masklike look.

Transplant doctors acknowledge that a face transplant can fail if patients' bodies reject the foreign tissue or fail to circulate enough blood to it, but they insist a face transplant is no more likely than a kidney transplant to be fatal. Still, the procedure is complex. A brain-dead donor would be kept alive until doctors "harvest" or "deglove" her face in a four- to six-hour operation. Then, in a 10- to 15-hour procedure, they would drape the donor's facial skin, in one piece, over the recipient's bones and muscles.

While doctors may be bullish on the procedure, many patients and activists worry about potential complications and ethical issues. "The dilemma is, can you give informed consent, because there are so many unknowns," says Acton. Mary Hessel, for one, isn't interested. Nine years ago, Hessel, now 37, survived a gas explosion that left her with third-degree



FRONTIER:
French doctors gave a new mouth, nose and chin to a woman mauled by a dog

burns over 75 percent of her body. Since then, doctors have operated on her face 18 times. But her burned face is not "life threatening," she says, and she doesn't want to spend a lifetime on the ex-

pensive, risky immunosuppressant medications she would need to keep her body from rejecting foreign tissue. Indeed, the biggest ethical question is, do the risks posed by lifelong immunosuppression drugs justify the benefits of receiving a new face? The

\$2,000-a-month drugs increase the risk of infection, cancer and metabolic disorders, and can damage the liver and kidneys. "I'd like to see one of the doctors be the first one," says Betsy Wilson, director of the support network Let's Face It.

There is no race to be the first to perform a full-face transplant, doctors insist. "We have a methodical and go-slow attitude," says Dr. James Zins, chairman of plastic surgery at the Cleveland Clinic. The immediate challenge is to find a physically and psychologically suitable patient, someone willing to take a risk—and maybe even become a famous face. ■

The Man Who Lost His Face

How a severely burned World War II pilot with a will to live helped launch the age of organ transplants.

BY JOSEPH E. MURRAY, M.D.,
WITH ANTHONY L. KOMAROFF, M.D.

As doctors start performing face transplants, it's ironic that the story of human organ transplantation began with a man who lost his face. On Dec. 23, 1944, a 22-year-old pilot named Charles Woods taxied down a runway in Kurmitola, India, carrying 28,000 pounds of aviation fuel. The plane exploded on take-off. Woods survived, but suffered severe burns over 70 percent of his body. The fire erased his face, destroying his nose, eyelids and ears.

No one had ever lived with such severe burns, but Woods had an indomitable will. Six weeks after his accident, he arrived at Valley Forge General Hospital, an Army hospital in Pennsylvania where I was stationed. He was still clinging to life. Woods needed new skin, and in desperation, we took the skin from a recently deceased soldier, with his family's

permission, and draped it onto Woods. This "foreign" skin normally would have been rejected by Woods's immune system within 10 to 14 days—too soon for his own skin to grow back. However, possibly because of his debilitated condition, his immune response had been tamed. The new skin survived for more than a month—buying Woods just enough time to save his life.

Over the next two years, we operated 24 times to build Woods a new face—a new nose, eyelids and ears—but he still looked like no one you have ever seen. When we were through, Woods looked in the mirror, walked out into the world, raised a family and built successful businesses. He died in 2004.

I returned from the war and resumed my surgical training in the repair of faces misshapen by injury and disease. I also joined a team at Peter Bent Brigham Hospital dedicated to attempting kidney transplantation as a treatment for kidney failure. Many thought organ transplantation could never work because the patient's immune

system was likely to reject a transplanted organ. But I knew something had tamed Woods's immune system. So transplantation did not seem a futile quest to me.

After several years developing the necessary techniques, I learned about a 22-year-old man, Richard Herrick, who was dying of kidney failure, and who had an identical twin brother, Ronald, with two healthy kidneys. A kidney from an identical twin would not be rejected as "foreign." So, on Dec. 23, 1954—10 years to the day after Charles Woods was burned—we performed the first human organ transplantation from a living donor. Later advances made transplantation successful among people who were not identical twins.

Last year I helped light the torch at the 2004 Transplant Games in the Minneapolis Metrodome. More than 2,000 competitors were on the field, all of them with a transplanted organ. And all of them with a debt to a man who lost his face, but not his will to live.

MURRAY won the Nobel Prize in 1990 for organ transplantation and wrote the book "Surgery of the Soul." KOMAROFF is professor of medicine at Harvard Medical School.

MICHAEL HUGHES—MEDIA PRO-CORBIS

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Pliable - Easily bent or shaped.

Immunosuppressant - Suppression of the immune response, as by drugs or radiation, in order to prevent the rejection of grafts or transplants. The immune system - The integrated body system of organs, tissues, cells, and cell products such as antibodies that differentiates self from non-self and neutralizes potentially dangerous organisms.

Metabolic - The chemical processes occurring within a living cell or organism that are necessary for the maintenance of life. In metabolism, some substances are broken down to yield energy for vital processes while other substances, necessary for life, are created.

Methodical - Slow and deliberate; step-by-step, cautious.

Indomitable - Incapable of being overcome, subdued, or vanquished; unconquerable.

Debilitated - Lacking strength or vigor; weak and feeble.