

Kidneys lead the field

**Hearts, livers, spleens, lungs,
pituitary and adrenal glands
also replaced in patients**

While the drama of human heart transplants has grasped the public interest, kidney transplants are ahead in the field. In centers around the world more than 1,200 patients who otherwise would have died have received transplants. If the kidneys have been given by related donors the chance of the transplant's survival for more than a year is 65 to 75 percent.

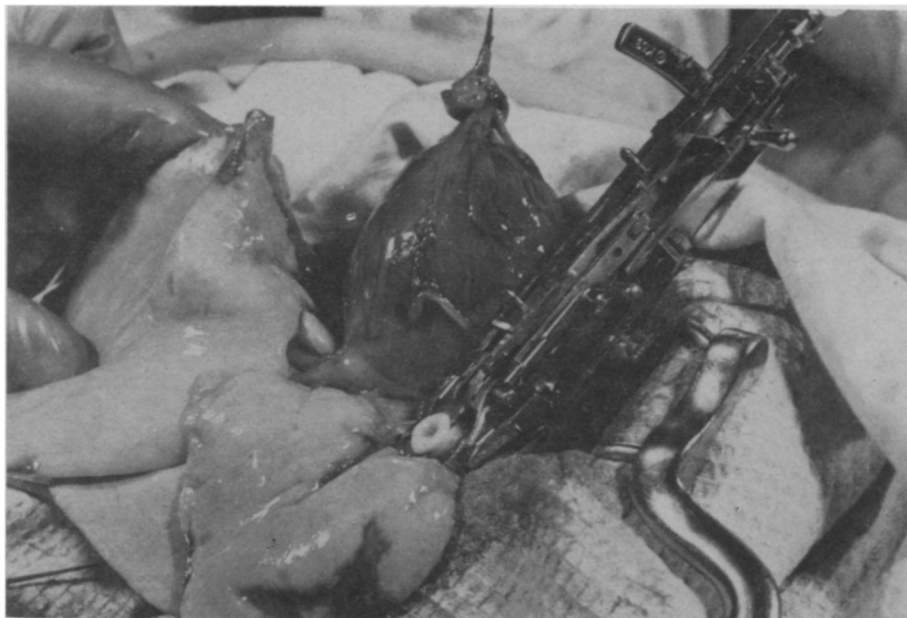
Dr. John P. Merrill of Harvard Medical School and Peter Bent Brigham Hospital, who with Dr. Joseph E. Murray and others in a pioneering effort, transplanted an identical twin's kidney in the mid 50's, says there must be at least 25 pairs of identical twins living who have had similar surgery. The recipient of that kidney taken from Ronald Herrick—his brother, Richard—died after seven years.

Because of immunological problems, those who get kidneys from unrelated donors do not do so well, their chances for a one-year survival being 25 to 40 percent. Failure of the transplanted kidney need not be fatal; second and third transplants have been successful.

Although only three little girls are now surviving liver transplants, the liver is a promising field for replacement. An estimate of potential liver recipients in the United States alone was about 4,000 in 1963. These were patients who either had cirrhosis or a malignancy localized in the organ. The donor, of course, must be dead; no one can live without his liver. It is estimated that the number of potential sources for this organ is about 16,000 suitable cadavers a year.

The spleen has been transplanted reportedly in five patients, with considerable contribution of technique from the Russians, who have been extremely cautious about hearts. Some Russian surgeons have suggested heart transplants in stages; the new heart would be implanted first and the body supported by two hearts for a time to make sure the new one would work.

A Russian, too, Dr. N. A. Bogoraz, in 1938 transplanted glands from young



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Dr. Vladimir Demikhov transplanted a second heart into one dog.

subjects accidentally killed, into 11 pituitary dwarfs. He reported on four of these patients followed up for more than 18 months. One had grown in height so much that he had ceased to be looked upon as a dwarf.

In his review of human tissue transplantation in *ADVANCES IN IMMUNOLOGY* (1967), Dr. Merrill includes the lung. Dr. J. D. Hardy of the University of Mississippi, with his collaborators, transplanted a human lung in 1963 into a patient who survived 18 days following the operation. A second patient died after seven days, from infection.

"It is apparent," says Dr. Merrill, "that transplantation of the lung in humans is technically feasible with respiratory function and that significant prolongation of survival in animal and man may be obtained."

A London surgical team has announced that it was prepared to transplant both human lungs and heart—as a unit—whenever the opportunity occurs.

Dr. C. Walton Lillehei, formerly of the University of Minnesota and now at Cornell University Medical Center-New York Hospital, says this is feasible. This method is believed to lessen the likelihood of rejection.

Long term preservation of individual living organs, which is the dream of many surgeons, is still far from realization, and that is why so many are in favor of artificial organs. The normal period of time after which a liver or kidney may be safely replanted is 24 to 30 hours, which indicates that further progress is urgently needed if enough organs are to be available when needed.

Dr. Merrill has transplanted kidneys from non-identical twins and from cadavers, using irradiation and drugs to prevent rejection, although with cadaver kidneys, he says, he uses only drugs.

He emphasizes that only when other treatment methods have failed, and the patients are not sick enough so that a major surgical operation and use of immunosuppressive therapy will be unwise, should a surgeon consider a transplant.

"Obviously a kidney transplant will not cure emphysema, cancer, coronary artery disease and severe diabetes with vascular complications," he says. A 55-year-old patient with good blood vessels may be a better candidate for transplant than a 45-year-old one who has hardening of the arteries.

The size of organs apparently is not as important as it might seem. Dr. Thomas Starzl of Denver, in 1966, transplanted adrenal grafts from adults to recipients as young as three years without anatomical problems.

Corneal grafts survive because the cornea lacks blood vessels or vascularization. The cornea receives oxygen and nutrition through the membranes and by shutting out immunologically competent cells, rejection is prevented.

If a cornea is transplanted to the front of the chest wall, however, where blood vessels enter, the invading cornea is destroyed.

A person's own skin grafts are not rejected, but in the necessary use of foreign skin to cover burns, one explanation of its prolongation is that there is increased production in the body of adrenal cortical steroids that prevents immediate rejection.

Faye Marley