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How the Transplant System Works: Matching Donors and Recipients

Under contract with the U.S. Department of Health and Human Services' Health Services & Resources Administration (HRSA), the United Network for Organ Sharing (UNOS) maintains a centralized computer network linking all organ procurement organizations and transplant centers. This computer network is accessible 24 hours a day, seven days a week, with organ placement specialists in the UNOS Organ Center always available to answer questions.

After being referred by a doctor, a transplant center evaluates the possible transplant. The transplant center runs a number of tests and considers the patient's mental and physical health, as well as his or her social support system. If the center determines that the patient is a transplant candidate, they will add the patient's medical profile to the national patient waiting list for organ transplant. The patient is not placed on a ranked list at that time. Rather, the patient's name is added to the "pool" of patients waiting.

When a deceased organ donor is identified, a transplant coordinator from an organ procurement organization accesses the UNOS computer. Each patient in the "pool" is matched by the computer against the donor characteristics. The computer then generates a ranked list of patients for each organ that is procured from that donor in ranked order according to organ allocation policies. Factors affecting ranking may include tissue match, blood type, length of time on the waiting list, immune status and the distance between the potential recipient and the donor. For heart, liver, and intestines, the potential recipient's degree of medical urgency is also considered. Therefore, the computer generates a differently ranked list of patients for each donor organ matched.

The organ is offered to the transplant team of the first person on the list. Often, the top patient will not get the organ for one of several reasons. When a patient is selected, he or she must be available, healthy enough to undergo major surgery, and willing to be transplanted immediately. Also, a laboratory test to measure compatibility between the donor and recipient may be necessary. For example, patients with high antibody levels often prove incompatible to the donor organ and cannot receive the organ because the patient's immune system would reject it.

Once a patient is selected and contacted and all testing is complete, surgery is scheduled and the transplant takes place.

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Placement on the Transplant Waiting List and Waiting

If a medical evaluation shows that you're a good candidate for a transplant but you don't have a family member or friend who can donate a kidney, you'll be put on the transplant program's waiting list to receive a kidney from a deceased donor—someone who has just died.

Every person waiting for a deceased donor organ is registered with the Organ Procurement and Transplantation Network (OPTN), which maintains a centralized computer network linking all regional organ gathering organizations (known as organ procurement organizations, or OPOs) and transplant centers. The United Network for Organ Sharing (UNOS), a private nonprofit organization, administers OPTN under a contract with the Federal Government.

UNOS rules allow patients to register with multiple transplant centers. Each transplant center will probably require a separate medical evaluation, even if a patient is already registered at another center.

Observers of OPTN operations have raised the concern that people in certain regions of the country have to wait longer than others because allocation policies for some organs give preference to patients within the donor's region. Kidneys, however, are assigned to the best match regardless of geographic region. The Federal Government continues to monitor policies and regulations to ensure that every person waiting for an organ has a fair chance. The key to making waiting times shorter is to increase the number of donated organs.

How long you'll have to wait depends on many things but is primarily determined by the degree of matching between you and the donor. Some people wait several years for a good match, while others get matched within a few months.

While you're on the waiting list, notify the transplant center of changes in your health. Also, let the transplant center know if you move or change telephone numbers. The center will need to find you immediately when a kidney becomes available.

OPOs are responsible for identifying potential organs for transplant and coordinating with the national network. The 69 regional OPOs are all UNOS members. When a deceased donor kidney becomes available, the OPO notifies UNOS, and a computer-generated list of suitable recipients is created. Suitability is initially based on three factors:

- Blood Type - Your blood type (A, B, AB, or O) must be compatible with the donor's blood type.
- HLA Factors - HLA stands for human leukocyte antigen, a genetic marker located on the surface of your white blood cells. You inherit a set of three antigens from your mother and three from your father. A higher number of matching antigens increases the chance that your kidney will last for a long time.
- Antibodies - Your immune system may produce antibodies that act specifically against something in the donor's tissues. To see whether this is the case, a small sample of your blood will be mixed with a small sample of the donor's blood in a tube. If no reaction occurs, you should be able to accept the kidney. Your transplant team might use the term negative cross-match to describe this lack of reaction.

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