Organ transplant involves the surgical removal of a diseased or damaged organ and replacing it with a healthy organ from a donor. Many major organs, including the heart, lungs, liver, and kidneys, can now be transplanted routinely. Tissue transplants from the eyes, skin, and bone marrow are also common. In 2010, the first full face transplant in the world was performed on a man in Spain who had previously been injured in a shooting accident. In general, the success rates of organ transplants, which range from 50–90 percent, depend upon the organ transplanted and the underlying health of the recipient. Most often, physicians perform organ transplantations only on patients who are in the last stages of organ failure and for whom other treatments have not been successful. In addition to rejection of a transplanted organ by the recipient's immune system, which is a major medical issue that limits the number of usable organs, there are also legal and cultural challenges that limit the number of available donor organs.

According to the United Network for Organ Sharing (UNOS), there were more than 118,400 individuals in the United States awaiting donor organs in 2017, and that number increases daily. More than 33,500 organ transplants were performed in the U.S. in 2016, a record high. The U.S. Department of Health and Human Services estimates that 79 Americans receive donor organs daily, but 22 people awaiting suitable donor organs die each day. One person can save up to eight lives through organ donation. The importance of organ donation was spotlighted in the media in late 2017, when 25-year-old American singer and actress Selena Gomez required a kidney transplant due to complications from systemic lupus erythematosus, an autoimmune disease. About 60 percent of persons with lupus will experience kidney involvement, and lupus remains a major cause for kidney transplants. Gomez received a kidney from her best friend, and after recovery, both embarked on a campaign to raise awareness for the continuing need for organ donors.

**Key Figures**

- United Nations, an intergovernmental organization established in 1945 that promotes international cooperation, peace, human development, and environmental sustainability
- United Network for Organ Sharing (UNOS), a private, non-profit organization that manages the organ transplant system in the United States
- U.S. Department of Health and Human Services, a federal cabinet-level department charged with protecting the health of all Americans and providing essential human services

**Key Events**

- 2008: The Declaration of Istanbul is adopted, which calls for an end to exploitation of the poor who sell their organs for money, and to transplant tourism
- 2010: Doctors perform the first full face transplant on a man in Spain who had been injured in a shooting accident
- 2016: More than 33,500 organ transplants were performed in the U.S., a record high
- 2017: American singer-actress Selena Gomez campaigns for organ donation awareness after undergoing a kidney transplant, receiving the kidney from her long-time best friend
Background

Because there are more people waiting for transplants than there are organs available, an allocation system is necessary. In general, this process has three steps. A patient must first be declared eligible for a transplant and make arrangements to be near a center where transplants are performed. Next, the patient is placed on a transplant waiting list. The third step is organ allocation, ideally using an impartial and consistent process that maximizes benefit for the largest possible population.

In a number of countries, there are debates regarding the proposed adoption of "opt out" or "presumed consent" schemes in which everyone is a potential organ donor unless they take specific steps to specify otherwise. In Austria, for example, more than 99 percent of its citizens are listed as potential organ donors. In contrast, in neighboring Germany—a country with similar cultural traditions—only about 12 percent of the population are registered as potential organ donors. Critics of presumed consent schemes claim that they circumvent personal rights, but proponents argue that they are the most reasonable and efficient way to handle critical organ and tissue shortages.

In some opt-in systems, such as the system in England, donor permission may be general or limited. In April 2010, although an investigation into the circumstances and extent of the practice remained under investigation, an alleged data handling error by the British National Healthcare Service resulted in the post-mortem removal of organs from individuals improperly listed as non-exclusive organ donors. Because of religious or cultural preferences, some individuals may consent to the removal of specific organs, but exclude the donation of others (e.g., allow kidneys to be removed but not portions of eyes). Errors in recording specific wishes apparently resulted in more than one dozen cases of organ removal without prior consent. In most countries, it is against the law to remove organs for transplant after death without prior consent, or the specific consent of the family.

Adoption of organ donation opt-out systems in Scotland and Wales (where people must specifically decline to be organ donors) has boosted the number of organ transplant recipients in the U.K. to record levels. In July 2017 the BBC reported that more than 50,000 people across the U.K. were living organ recipients. The National Health Service estimated that there were approximately 36,300 kidney recipients, 9,800 liver recipients, and 1,900 pancreas transplant survivors living in the U.K.

Global Impact

Although differences exist between countries, organ transplantation laws usually require that both the donor's and recipient's rights be protected. For example, using living donors decreases waiting time and allows genetic risk factors related to rejection to be better controlled. However, living donors face risks from both the operation and the loss of a donated organ or tissue. Minimizing the donor's risk must, therefore, be a higher priority than organ harvesting. Most industrialized countries have laws that prohibit organ trading. This includes commercial purchase and trade as well as individual compensation for donated organs.

Living donors must understand the risks and consequences of the donations and be legally competent
to give informed consent. In most regions of the world, regulations prohibit minors and individuals considered to be mentally handicapped or having diminished legal capacity from being donors.

Although donors have the ultimate right to self-determination, family pressure and feelings of guilt may compel some people to become donors. Religious and cultural differences also affect organ donor rates around the world. For example, until recently, most Muslims eschewed organ donation because of Islam’s prohibition against desecrating the body. Currently, however, most Muslim religious leaders promote organ donation as a life-saving act.

Important Developments

The Declaration of Istanbul, adopted in May 2008 at an international conference of transplant professionals, calls for an end both to exploitation of the poor who sell their organs and to transplant tourism, which risks physical harm by unregulated and illegal transplantation. Although organ trading practices are prohibited by international law, the economic realities of poverty continue to support illegal trade in organs and tissues.

In most countries, prior consent of a potential donor is required for organs and tissues to be harvested following the donor’s death. In some cases, however, prior consent is not required. For example, China’s former Deputy Health Minister Huang Jiefu (1946–) stated in 2006 that most organs used for transplantation in China were harvested without consent from the bodies of executed prisoners. Chinese public health officials defend the policy because widespread cultural prohibitions against donating the organs of a deceased family member result in low rates of voluntary donation. In December 2014, however, Chinese officials announced that they would end the practice of harvesting organs from executed inmates as of 1 January 2015.

In March 2012, investigators publishing in the journal *Medical Anthropology Quarterly* found patterns of illegal organ trafficking and predatory solicitation for organs in Bangladesh. In many cases, unscrupulous traders lure poor people into organ donation schemes—often through newspaper advertisements—only to become elusive when the donors seek their payment and other forms of promised compensation. Donors sometimes discover that they are financially responsible for their own medical care following organ donation. There are darker reports of potential donors being targeted for murder in order to harvest organs and tissues at a low cost to the organ dealer. In October 2009, a study sponsored by the United Nations and the Council of Europe reported continuing failures in enforcement of the 1994 Human Organs Transplant Act banning human organ and tissue sales in India. Analysts estimated that up to ten percent of kidney transplants performed each year used illegally procured or trafficked organs. The report singled out India as a major source for organs and tissues supplying the global black market.

The United States’ National Organs Transplant Act (1984), which similarly prohibits a marketplace for human organs, is being challenged by groups that hold that its restrictions should not apply to the donation of bone marrow cells. The California-based non-profit group BoneMarrowDonors.org argued in 2011 that compensation for bone marrow cells likely would increase their availability and result in more people receiving effective treatment for leukemia and lymphoma, and that bone marrow cells should be considered replenished in a similar fashion to blood, plasma, and semen, for which the law
In February 2012, U.S. doctors completed the world's largest kidney transplant chain to date. Thirty people received kidneys from thirty different living donors, all matched through the National Kidney Registry. The chain began with the donation of a kidney by a man in California to an anonymous stranger in New Jersey. Most of the donor participants in the chain had offered to donate to a loved one in need of a kidney but were not suitable matches. They then agreed to donate to a stranger-in-need in hopes that their loved one could secure a similar Registry-matched donation. The thirty linked transplants occurred across seventeen hospitals in eleven states over four months.

In August 2014, researchers announced a major step towards designing and growing whole organs for patients instead of relying on transplantation. Researchers at the University of Edinburgh in Scotland announced the generation of a thymus—an important part of the immune system—in mice. The scientists used stem cells from mice embryos and then reprogrammed the cells to produce cells found in the thymus. The cells then grew to form a fully-functional thymus after implantation in living mice. While the technique holds great promise for growing new organs for human implantation, researchers caution that any practical use in humans remains years away.

In 2014, U.S. researchers and physicians successfully engineered and implanted lab-created vaginas into four women with vaginal aplasia (a condition producing atypical vaginal development) as a result of Mayer-Rokitansky-Küster-Hauser Syndrome (MRKHS). All of the implant recipients reported normal organ function after the surgery.


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