

The Transplant Process

The Recipient

Diagnosis

The body's organs or tissues can be formed abnormally at birth, or can be damaged as a result of accidental injury or disease. When vital organs, such as the liver, kidneys, lungs, pancreas, or heart are severely damaged, they may need to be replaced for a person to survive. Replacing some damaged tissues may allow a person to return to a normal life—a cornea to renew sight or a bone or tendon to restore the ability to walk or move without pain. Organs can be donated by two types of donors: deceased and living, with the exception of bone marrow which can only be donated by living donors. Tissues can only be donated by deceased donors. The transplant process described in this section deals mainly with organs donated by deceased donors. (See **Types of Donors**) Bone marrow transplantation will not be covered extensively in these educational materials (for additional information about bone marrow transplantation see: www.hhs.gov/diseases).

Referral and Evaluation

Once a doctor determines the need for an organ transplant, the individual is referred to a transplant center—a hospital that performs transplants—for evaluation. If certain criteria are met, the individual is accepted into the transplant program at that center. The individual's blood and tissue types are determined and he or she is placed on a national transplant waiting list.

Waiting

The period of time a patient may be on a waiting list before receiving a transplant depends on a number of factors: How sick is the person? What is the person's blood type? Is a suitably matched organ available? Unfortunately, because of the shortage of donated organs, many people die before a compatible organ becomes available. If an organ does become available for a particular patient on the waiting list, the patient's doctor is notified. If the doctor concludes that the donated organ is compatible, and that the patient is in suitable condition to undergo the transplant operation, preparations for surgery begin. (See **Matching Donors with Recipients** and **The Waiting List**.)

The Transplant

The donated organ is often surgically removed from the deceased donor at the same time as the recipient is prepared for surgery to reduce the time that the donated organ has to survive outside the body. Since the recipient is often at a different hospital than the donor, a member of the recipient's transplant team may have to travel to the donor's location to remove and transport the donated organ.

Recovery

After surgery, the recipient undergoes a period of recovery—sometimes only a few weeks. However, if the recipient's immune system rejects the donated organ, the recovery period could be much longer. To combat rejection, doctors administer immunosuppressive drugs. (See **Rejection** and **Matching Donors with Recipients**.)



NOTE: To learn more about the ways to declare an intention to be a donor in your area and your state's requirements for minors wishing to be a donor, visit www.organdonor.gov/opo.htm to locate your local organ procurement organization.

A Better Life

If the transplant is successful, the recipient may return to a normal and active life, but must have regular check-ups and continue to take medicine for the rest of his or her life. While transplantation is not a “cure,” when successful it provides an increase in the quantity and/or quality of life

The Donor

Becoming a Donor

Many people express a wish to be a donor when they die and take steps during their lifetime to designate themselves as a donor. A person may use one of a variety of methods to express an intention to be an organ and tissue donor: signing a donor card, indicating intent to donate when applying for or renewing a driver's license, or joining a donor registry.

Minors generally may indicate an intention to be a donor. While State laws on requirements for minors vary, those States that allow a minor (often minors over the age of 16) to consent to donation generally require the signature of a parent or legal guardian.

Trauma and Death

Most organ donors are accident victims who have suffered severe and eventually fatal injuries—often a severe head injury. After arriving at the scene of such an accident, emergency medical personnel immediately begin life-saving procedures while the patient is transported to a hospital.

In the Emergency Room

When the ambulance arrives at the hospital, the patient is met by doctors and nurses ready to employ all possible measures to save the victim's life.

The Intensive Care Unit

If the injuries are severe, the patient is usually on a life-support system. Doctors perform tests to determine the extent to which the brain and other organs and tissues have been damaged as a result of the injury. If tests show the brain is no longer alive, the patient's family is informed that the patient is brain dead—that is, the brain has ceased to function, and the patient is dead. (See **Brain Death**.)

The Organ Procurement Organization

The organizations responsible for coordinating organ donation and transplantation are the organ procurement organizations (OPOs). Each of the 59 OPOs across the country is a Federally designated nonprofit organization that works with the hospitals in their designated geographic area to identify potential donors. These service areas may cover a single State or parts of adjoining States. In addition to identifying donors and obtaining consent where necessary, the OPOs are responsible for the evaluation, preservation, allocation, recovery, and transport of donated organs. The crucial role of the OPO in the organ donation and transplantation process is described below.

Hospital Referral and Evaluation by the OPO

Federal law requires that hospitals report all deaths and imminent deaths (a person who is near death) to the local organ procurement organization. Notification by the hospital allows an OPO coordinator to go to the hospital to determine if the deceased person is medically

Background: The Transplant Process

suitable to be a donor and to discuss donation with family members. The vital organs of the brain dead person are kept oxygenated by a mechanical support system until it is determined whether the deceased will be a donor. If it is determined that the deceased is not going to be a donor, the mechanical support system is discontinued. If the deceased is able to be a donor, the OPO coordinator arranges for the evaluation, surgical removal, and the preservation of donated organs and transport of each organ to the transplant center where the recipient is waiting. Mechanical support of the donor's organ is maintained until the organs are surgically removed.

Consent for Donation

Some States have passed laws providing that when a person signs a donor card, indicates an intention to be a donor on a driver's license, or joins a donor registry, this is a legal form of consent and must be honored. Family consent is not necessary for that deceased person's organs and tissues to be donated. These laws are often popularly referred to as "first person consent" and are based on the belief that the donor's wishes should be paramount and should not be overridden by family members. If the deceased person had not designated him or herself as a donor, the family is asked to make the decision whether to donate. (Generally, even if a deceased minor had indicated an intention to be a donor, the family is asked to consent to the donation.) In States with first person consent, OPO representatives take care to talk to the family before the removal of organs to make sure the family understands and appreciates their loved one's decision to save the lives of other people through organ donation.

In other States, even if a deceased person had signed a donor card, indicated an intention to be a donor on a driver's license, or joined a donor registry, the deceased's family will still be asked for their consent before organs and tissues are donated. A specially trained OPO representative offers the family the option of donating the deceased's organs and explains the donation procedures. The family is given time to consider and discuss their decision. If the deceased had indicated a wish to be a donor, it is often much easier for the family members to make a decision to donate their loved one's organs. The decision becomes even easier if the deceased had discussed donation with family members.

No matter what State you live in, it is important to indicate your intention to be a donor through the various methods available—and *just as important*—to convey those wishes to your family to increase the likelihood that your organs or tissues will be donated or not according to your wishes. A family's decision to donate or their acceptance of a loved one's decision to donate is made much easier if the deceased had told them of his or her desire to be a donor.

Organ Placement

Immediately following the identification of the deceased as a donor, the process of organ placement begins. Information about the donor, such as body size, blood type, and geographic location of the donor, is entered into the computer system of a national network—the Organ Procurement and Transplant Network (OPTN). This computer system identifies potential recipients on the national waiting list who best match the available organs. Based on medical and scientific criteria, a list of potential recipients is generated for each of the donor's organs. One donor may be able to supply organs and tissues for many recipients. (See **Matching Donors With Recipients** and **The Waiting List**.)

Organ Recovery and Transportation

A specific recipient for each organ to be donated is identified. In some cases a surgeon from each recipient's transplant team comes to the hospital to surgically remove the organ to be donated to that recipient. In other cases surgeons at the donor's hospital remove the organs. In either case, organs are quickly preserved and transported to the transplant centers where the recipients are waiting. Tissues are often removed from the body a short time later, but both organ and tissue procedures are conducted rapidly so as to reduce the chance of organ or tissue deterioration.

Funeral Arrangements

The usually quick removal of organs or tissues minimizes any delay in funeral arrangements. Organ and tissue removal also is done in such a way that an open-casket funeral is still possible.

Follow-Up

OPOs ensure that the names of donors and recipients remain confidential, but most donor families appreciate knowing that a gift of life came from their tragedy. After a few weeks, the OPO sends the donor's family a letter informing them how their loved one's organs and tissues were used. While the names of the recipients remain confidential, donor families can request updates about recipients by contacting their OPO. Often recipients ask OPOs to pass letters on to a donor's family expressing their gratitude. This can be a great comfort to donor families. Recipients may eventually meet donor families if both parties agree to this meeting.

Common Questions and Misconceptions

How are organs and tissues for transplantation obtained?

Many organs and all tissues are donated by deceased donors—most often a person who has been declared brain dead. A kidney, parts of some other organs, and bone marrow can be transplanted from living individuals—relatives or friends of the recipient or people who choose to be anonymous donors. (See **Types of Donors**.)

Is brain death the same as being in a coma? I have heard that people can recover from a coma. Can people recover from brain death?

A coma and brain death are completely different. A person in a coma still has brain activity and is alive. The person may recover from a coma and possibly regain normal brain function. People who are brain dead have no brain activity. They are dead. Their brain can never recover, but the rest of their body may be kept functioning for a short time by a mechanical support system. (See **Brain Death**.)

Is there an age limitation on whose organs can be transplanted?

There are no age limitations on who can donate. Both newborns and senior citizens have been donors. Physical condition, not a person's age, determines suitability to be a donor. Because of disease or other problems, some people wishing to donate may be ruled medically unsuitable. This determination is best made by transplant specialists at the time someone wishing to be a donor has died.

If I am in an accident, and the doctors know I wish to be a donor, will they still do everything possible to try to save my life?

Yes. Doctors always try everything possible to save a life. In fact, the medical personnel treating an accident victim are not the same as the medical personnel involved in organ donation and transplantation. Organ donation becomes a consideration—and the local organ procurement organization (OPO) is contacted—only when *all life-saving efforts* have been exhausted.

What is an OPO?

An OPO is a Federally designated nonprofit organization responsible for coordinating organ donation and transplantation in a specific geographic area. There are currently 59 OPOs serving the United States and Puerto Rico. In addition to identifying potential donors and obtaining consent where necessary, the OPOs are responsible for the evaluation, preservation, allocation, recovery, and transport of donated organs.

Can anyone declare intent to become an organ or tissue donor?

Anyone can express a wish to become a donor by joining a donor registry, signing a donor card, or indicating intent to donate on a driver's license application. A family may decide to donate the organs of a deceased loved one who has not indicated a choice about donation or who is under age—a child, for example.

A minor usually has to take additional steps to declare his or her decision to be a donor. While requirements vary from State to State, most States require the written consent of



NOTE: Locate your OPO by visiting the official donor Website of the U.S. Department of Health and Human Services and clicking on www.organdonor.gov/opo.htm.

the minor's parent or guardian. Many States will only honor the decision of minors over a certain age (for example, minors over the age of 16). Most States consider an 18-year-old to be an adult with respect to the decision to donate; however, this also varies by State. Your local OPO is the best source of information on the requirements in your State.

How do I indicate my wish to be a donor?

You may designate yourself as a donor when you apply for or renew a driver's license or by signing a donor card or joining a donor registry where available. Your local OPO can tell you how to document your donation intentions in your area or State.

What is a donor registry and how do I know whether there is one where I live?

A donor registry is a computerized database of people who wish to be donors when they die. The importance of a registry is that donation intentions can be quickly retrieved 24 hours a day/7 days a week, whereas a donor card or driver's license may not always be available when someone dies. A registry, therefore, provides a reliable way of conveying donation wishes. Donor registries are available in over 20 States. Most, although not all, State registries are operated by divisions of motor vehicles. Ways of joining a registry might include the following: donor card, driver's license, on-line or telephone access, or at public events such as health fairs. Donor registries also provide easy access for people who want to remove their donor designation or place restrictions of the type of organs or tissues they wish to donate. Your local OPO can tell you whether your State or area has a donor registry and how you can join.

Are families of individuals who have just died but who had not declared an intention to be a donor given the option of donating their loved one's organs and tissues?

Yes. Federal law requires hospitals to report all deaths and imminent deaths to the local OPO. Each OPO works with hospitals in its area to coordinate identification, evaluation, removal, and transport of donated organs. This notification from the hospital allows OPO personnel to determine whether a person who has died is medically suitable to be a donor and to approach family members of potential donors to offer them the option of donating their loved one's organs and tissues.

Can my family be paid for my organs?

No. Organ donation is considered an act of charity by the donor and/or the donor's family, and buying or selling human organs is against Federal law.

If I have already decided to be a donor, will my family still get to decide whether my organs will be donated?

In many States, families are asked to provide consent for donation even if the deceased person had indicated an intention to be a donor. Although the decision of a deceased person to designate him or herself as a donor—through a donor card, driver's license, or donor registry—is sufficient consent in all States to allow the donor's organs and tissues to be donated without asking for the family's consent, OPOs in most States ask the donor's family to consent to the donation before proceeding. However, an increasing number of States are passing laws that provide that OPOs must honor the decision of a deceased person to designate him or herself as a donor.

Background: Common Questions and Misconceptions

This concept is often popularly referred to as “first person consent” and is based on the belief that the donor’s wishes should be paramount and not be overridden by his or her family after the person’s death. If the deceased person had not designated him or herself as a donor, the family is asked to make the decision whether to donate. (Generally, even if a deceased minor had indicated an intention to be a donor, the family is asked to consent to the donation.) In first person consent situations, OPO coordinators take great care to talk to the family before the removal of organs to make sure that the family understands and appreciates the donor’s desire to save the lives of other people through organ donation.

Does organ donation preclude an open-casket funeral?

No. People who donate organs and tissues can have an open-casket funeral. The surgeons who remove the organs and tissues handle the body in a sensitive way, as they would in any surgery.

Do any religions oppose organ or tissue donation?

Most major religions or religious organizations either actively support organ and tissue donation or leave the decision up to the individual. (See **Religious Views on Donation**.) Those in doubt about their religion’s views should talk with their faith leaders.

If I need an organ in order to live, will I be able to get one?

Maybe. Many people who need transplants cannot obtain them because of a shortage of donated organs. There are many more people on the waiting list than there are available organs. As of early-2004, there were nearly 84,000 people on the national waiting list. Every day, an average of 18 people on the list die waiting for a compatible organ, while an average of 68 receive a life-saving organ transplant.

If my organs are donated, who decides who receives them?

A nonprofit organization under a contract with the U.S. Department of Health and Human Services operates a computerized national waiting list of people who need a life-saving organ transplant. This system matches each wait-listed patient against a donated organ to see which patient is the best match based on factors such as body size, weight, and blood type of the donor and recipient, how sick the patient is, how long the patient has been waiting for a transplant, and where they live in relation to the donor.

Can celebrities or rich or well-connected people jump over others on the waiting list or pay people for their organs?

No. In the U.S., the allocation of organs to recipients on the waiting list is based solely on medical and scientific criteria, and on waiting time. The principles of organ allocation are based on equity, urgency, and efficacy—the wealth, age, race, or gender of a person on the waiting list has no effect on when a person will receive a donated organ. In addition, the National Organ Transplant Act of 1984 makes it illegal to buy or sell human organs in the U.S.

If I become a donor, will all my organs and tissues be donated?

You may specify the organs and tissues you wish to donate. Your wishes will be followed. However, if any of your organs are diseased or injured, those organs will not be donated.

I have a history of illness. Are my organs and tissues likely to be of any use to anyone?

At the time of death, OPO personnel will review your medical history and decide whether your organs are suitable for donation. Advances in transplantation and medicines have allowed more people than ever to become donors.

Why is there a disproportionately large number of minority patients on the waiting list?

Minorities are disproportionately represented on the waiting list because certain minority groups are more likely to suffer from diseases that may result in organ failure and require a life-saving organ transplant. (See **Minority Health Issues**.)

Is there a cost associated with being a donor?

There is no cost to the donor's family or a deceased donor's estate. All costs of removal and preservation of the donated organs are borne by OPOs and are usually passed on to the transplant center and the recipient's insurance company. However, medical costs incurred while attempting to save the life of a potential donor are the responsibility of the donor's insurance company or the donor's family. Costs incurred after a person is determined to be a donor become the responsibility of the OPO.

If I don't have adequate health insurance, can I still be placed on the waiting list?

Given the scarcity of donor organs, transplant surgeons are concerned about transplanting patients who do not have the financial resources to pay for the transplant procedure and follow-up care needed to maintain the organ. In some cases, you might not be placed on the waiting list. However, transplant centers have social workers and financial counselors who work with people being evaluated for a transplant to help them find the necessary financial resources.

Why do I need to tell my family of my decision if I have already recorded my wish to become a donor?

In the event of your death, documentation of your wish to become a donor will increase the chance that you will be a donor. If your family is asked for consent, telling them about your decision to be a donor is the best way to ensure that your wishes are carried out. The death of a loved one is a very difficult time for a family, and knowing the wishes of the deceased makes it easier for them to decide about or accept donation.

Brain Death

You may have heard stories of people suddenly “coming to” in the morgue or at their own funeral.

Is it possible to be alive after being officially pronounced dead? If so, why would you want to take the risk of donating your organs? This may be a concern for some people—it shouldn’t be for two reasons. First, the goal of the medical profession is to preserve life. Second, only after every life-saving measure has been used—and a patient has *died*—would the process of organ donation proceed.

So what is the definition of “death” and how is the fact of death determined? Death may be pronounced in one of two situations: When the person’s heart stops beating (cardiac death) or when the person’s brain permanently stops functioning (brain death). While in some cases, organs can be donated by people who have died when their hearts stopped beating, most donated organs are transplanted from people who have died as a result of brain death. Tissues may be donated by people who have died as a result of brain death or cardiac death. (See **Types of Donors**.)

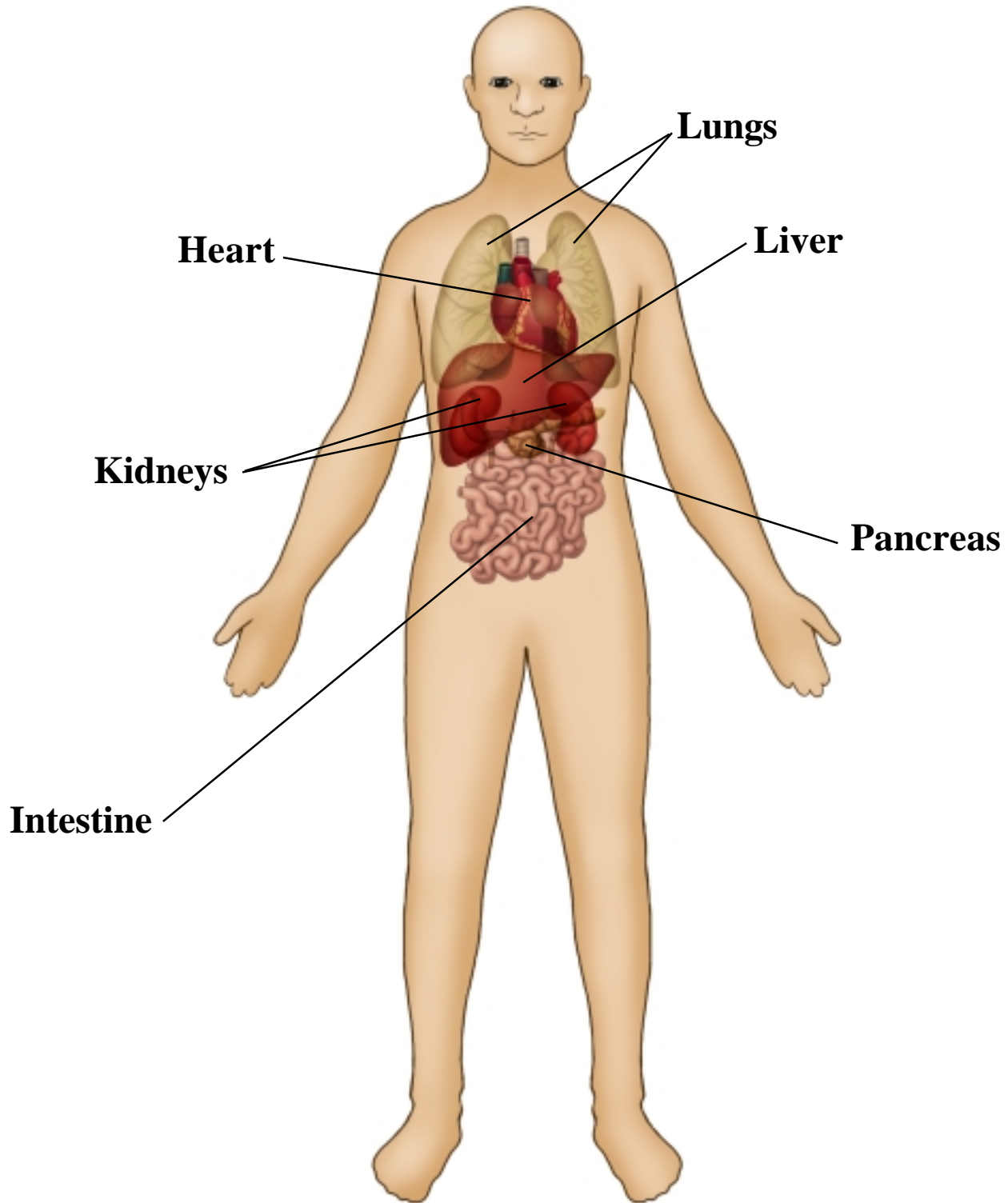
It is helpful for you and your family to understand the nature of brain death before you make the decision to become a donor. Your brain needs oxygen to keep working. When the brain is injured it swells. This swelling can prevent blood from entering the brain. When blood—which carries oxygen to the brain—stops flowing, the brain dies. This condition is known as brain death. A person who is brain dead has no awareness, cannot think, feel, move, or breathe. A person who is brain dead shows no brain activity, and no longer feels any pain or suffering.

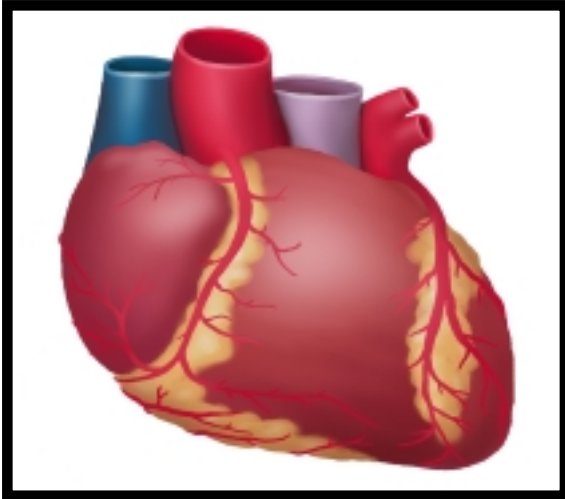
Brain death is a permanent condition and cannot be reversed. Without a functioning brain, the rest of the person’s organs can be kept working for a short time using a mechanical support system. Once this system is switched off, the body will stop working. A brain dead person on mechanical support may look as though he or she is sleeping, but because the brain is dead, the person is dead.

Several medical professionals perform a number of tests at separate times before a person is pronounced brain dead. If these tests prove that brain death has occurred, the body is kept on mechanical support to maintain the organs until it is determined whether the person will be a donor.



Transplantable Organs





Heart

This organ is a muscular pump that circulates blood carrying oxygen and nutrients to, and wastes from, the body's cells. The right side of the heart circulates blood to the lungs. The left side circulates blood to the rest of the body and back to the heart.

Transplant Statistics

- Each year, about 2,000 heart transplants and fewer than 50 heart-lung transplants are performed.
- In early 2004, around 3,500 people were on the waiting list for a heart transplant and about 200 were waiting for a heart-lung transplant.
- In 2002, over 550 people died while waiting for a heart transplant.
- About 85 percent of heart transplant recipients are surviving one year after transplantation.

Interesting Fact: On average, a human heart beats about 2.5 billion times in a person's lifetime.

Diseases and Disorders

- **Cardiomyopathy** is an abnormality of the heart muscle. The cause is often unknown. Advanced cases may require a heart transplant.
- **Congestive Heart Failure** is a condition resulting from heart disease such as coronary artery disease. The heart no longer pumps enough blood to meet the body's needs. A heart transplant may be needed if medical treatments fail.
- **Myocarditis** is an inflammation of the muscle tissue of the heart, often a complication of various infectious diseases. Severe cases can result in heart failure and require a heart transplant.
- **Congenital Heart Disease** is the most common lethal birth defect, and the most common indication for heart transplantation in infants and young children.

3.1 Background: Transplantable Organs

Lung

This pair of organs provides an environment for gas exchange: Oxygen passes into the bloodstream through microscopic air sacs in the lungs, while waste carbon dioxide passes out of the bloodstream into the lungs. Breathing facilitates this exchange of gases.



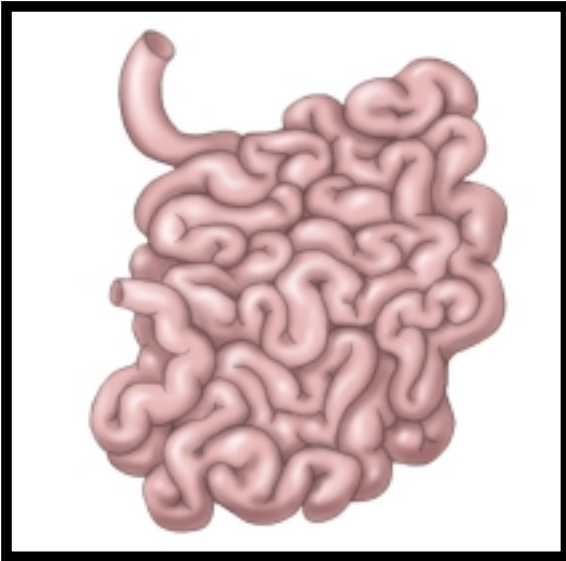
Diseases and Disorders

A number of diseases and disorders lead to lung transplants each year: **cystic fibrosis, pulmonary hypertension, pulmonary fibrosis, emphysema, and pulmonary edema**, among others. People with these conditions usually must lead a very sedentary lifestyle. Many of these conditions are life-threatening.

Interesting Facts: Normal breathing rate at rest for an adult ranges from 15-25 breaths per minute. During a 24-hour period, the average number of breaths taken by a human is around 23,040.

Transplant Statistics

- About 1,000 patients receive a lung transplant each year.
- Each year, about 4,000 people are waiting for a lung transplant.
- Over 400 people die each year while waiting for a lung transplant.
- About 75 percent of lung transplant recipients survive the first year.
- A single lung can save a life. One deceased donor can be the source of two lung transplants.



Intestine

The intestine is the part of the alimentary canal that extends from the stomach to the anus. The first part—a long, narrow, and convoluted section is referred to as the small intestine. Its function is to complete the digestion and absorption of digested nutrients into the bloodstream and lymph. The second part—the large intestine—is not usually transplanted.

Transplant Statistics

- Around 100 intestine transplants were performed in 2002.
- In early 2004, nearly 200 patients were on the waiting list for an intestine transplant.
- In 2002, over 50 people died while waiting for an intestine transplant.
- The one-year survival rate for intestine transplant recipients is about 60 percent.
- The majority of intestinal transplants are performed in infants and children.

Diseases and Disorders

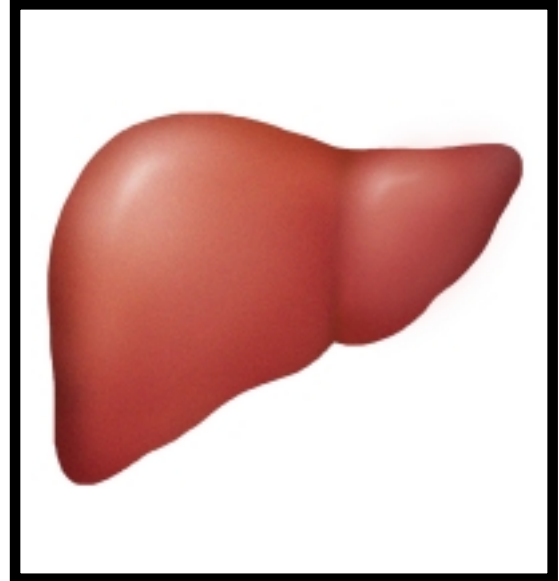
Intestine transplants are required when the intestine becomes twisted and blocked or when there is irreversible intestinal failure. Most cases of intestinal failure are caused by short-gut syndrome (a significant loss of length of the small intestine present at birth or as a result of surgical removal or trauma). People with intestinal failure must receive nutrients intravenously. Because long-term intravenous feeding usually causes liver damage, many people who require a small intestine transplant also require a liver transplant at the same time.

Interesting Fact: While smaller in diameter than the large intestine, the small intestine is much longer—about 7 meters to the large intestine's 1.5 meters.

3.1 Background: Transplantable Organs

Liver

This large organ destroys toxic substances in the body and breaks down unwanted protein into the waste product urea. The liver stores some food substances until the body needs them. It also produces a green liquid—bile—that is released into the intestine to help break down large fat droplets into smaller fat droplets to prepare fat for chemical digestion.



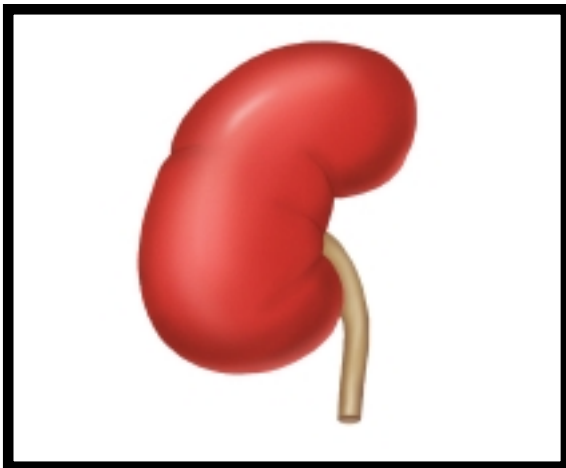
Diseases and Disorders

- Birth defects of the liver or bile duct.
- Chronic liver infections, such as **hepatitis** (particularly B and C), which severely damage the liver.
- Damage from alcohol and other drugs.
- Damage from blood clots in the liver.
- The skin of people with liver damage may turn yellow from a condition called jaundice. They also may gain weight and experience general weakness. Because the liver is involved in many metabolic processes, severe liver damage is often fatal.

Interesting Fact: More heat is produced by the liver than by any other organ in the body.

Transplant Statistics

- Around 5,000 people receive liver transplants each year.
- Each year, over 17,000 people are waiting to receive a liver transplant.
- Each year, about 2,000 people die while waiting for a liver.
- One year after the surgery, about 85 percent of liver transplant recipients live fairly normal lives.
- A donated liver can be split between two recipients, so that one deceased donor can be the source of two liver transplants.



Kidney

One of a pair of organs that control the amount of water in the body and filter urea and other wastes into urine. The kidneys also produce a hormone (erythropoietin) that controls the production of red blood cells.

Transplant Statistics

- About 14,000 kidney transplants are performed each year. Just over one third of transplanted kidneys are from living donors.
- At any point, about 55,000 people are on the waiting list for a kidney transplant.
- Every year, over 3,000 people die while waiting for a kidney transplant.
- The one-year survival rate for kidney transplant recipients is about 95 percent.

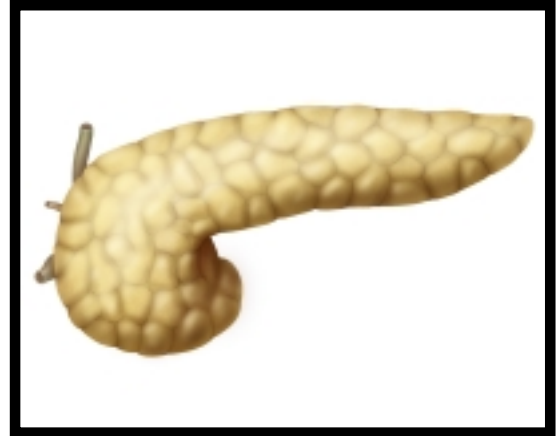
Interesting Fact: After kidney transplants, most recipients have three kidneys because their own kidneys are usually left in place.

Diseases and Disorders

- **High blood pressure** causes kidney damage, can lead to kidney failure, and is—as a result—an important predictor of kidney failure.
- **Diabetes** (see pancreas) is a leading cause of kidney failure.
- Other diseases (**cystic kidney diseases**) can cause the kidneys to become inflamed or can produce cysts in the kidneys that prevent them from functioning properly.
- People with severe kidney disease are often placed on dialysis machines—artificial kidney machines. They need to be connected to these large, stationary machines for about 24 hours every week. This severely impacts their work and lifestyle, sometimes leading to depression. A kidney transplant may improve the length and quality of life for some patients, and remove the need for dialysis.

Pancreas

The pancreas produces two enzymes—insulin and glucagon—that control the level of sugar in the blood. In addition, the pancreas produces a mixture of enzymes, called pancreatic juice, which is released into the small intestine to help digest starch, proteins, and fats.



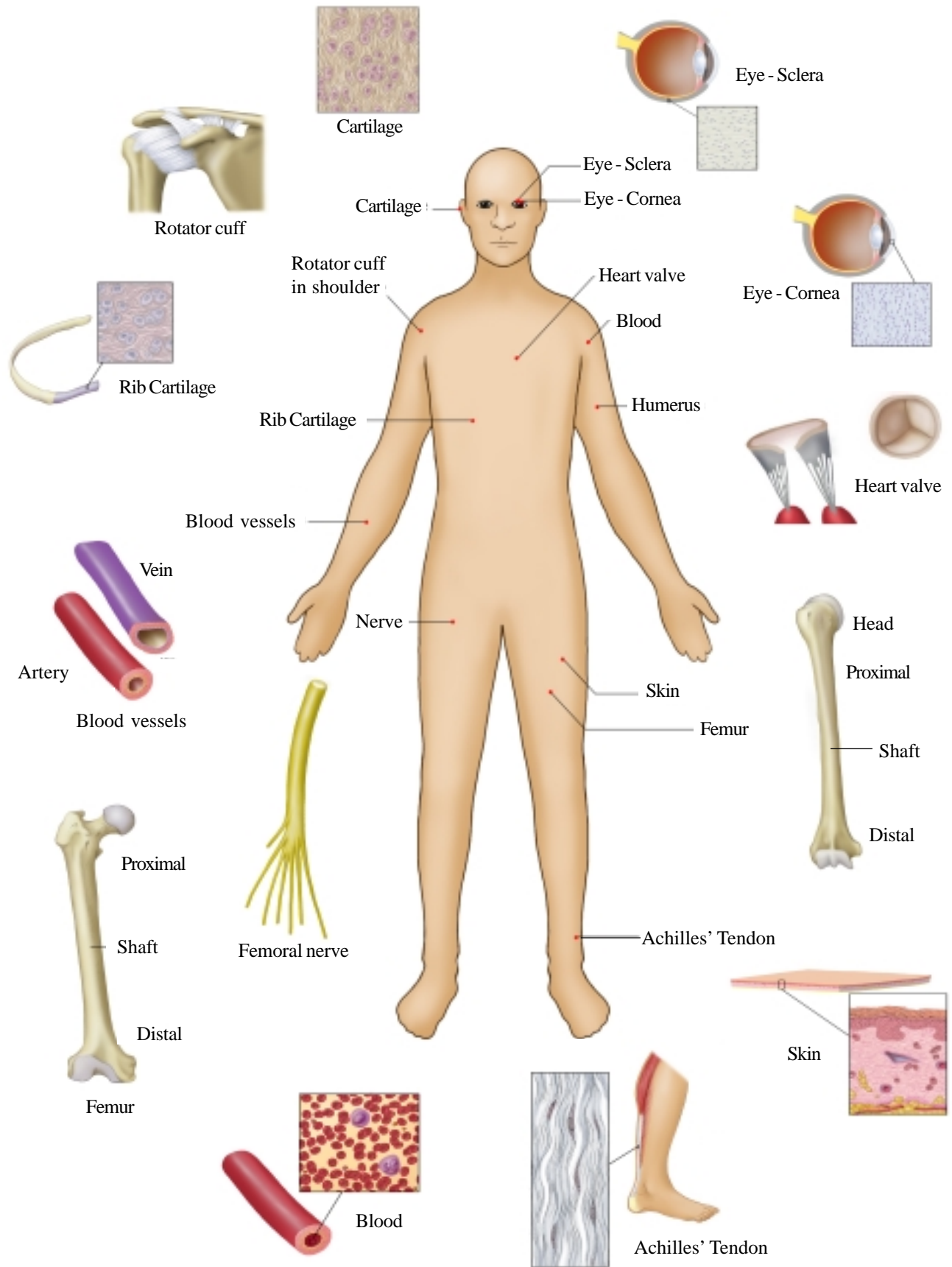
Diseases and Disorders

- Malfunction or failure of the pancreas leads to **diabetes**—an inability to control the level of glucose in the blood.
- Individuals with this condition are called diabetics and may need insulin to control the level of glucose in the blood. Diabetes can damage or cause the failure of many of the body's organs. Because patients requiring a pancreas transplant often have kidney disease, the pancreas and kidneys are sometimes transplanted together. Failure to treat diabetes can lead to organ failure and death.

Interesting Fact: The pancreas has a tremendous reserve capacity for the production of some enzymes. More than 95 percent of the function of the pancreas must be lost before the pancreas fails and symptoms of bloating and poor digestion occur.

Transplant Statistics

- In 2002, about 550 people received a pancreas transplant.
- In early 2004, about 1,500 people were on the waiting list for a pancreas.
- In 2002, about 30 people died while waiting for a pancreas transplant.
- One year after receiving a pancreas transplant, about 95 percent of recipients are still living.



Medical Applications of Donated Tissue

Tissue	Typical Applications	Benefits for Recipients
Eye Tissue		
Cornea	Replaces diseased or damaged cornea.	Prevents blindness; restores vision.
Sclera	Repairs eyelid; reinforces wall of eye. Also used to repair ruptured eardrums.	Prevents blindness; restores hearing.
Cardiovascular Tissue		
Heart valves	Replacement for damaged heart valves. Most common recipients are children born with congenital heart valve defects.	Older children who receive heart valve transplants may grow into grafts and require no second surgery for size—though infants and younger children may.
Blood vessels	Transplanted to restore circulation in the heart and extremities.	Helps prevent need for amputation and helps the heart meet the needs of the body.
Blood	Nine out of ten people who live to the age of 80 will need some type of blood component transfusion during their life.	Restores normal blood functions.
Bones and Connective Tissue		
Humerus	Reconstruction related to trauma, tumors, degenerative diseases, and fractures. Total hip revision.	Prevents need for amputation. Accelerates, promotes, and allows healing. Restores mobility.
Femur (upper leg) and Tibia (lower leg)	Reconstruction related to trauma, tumors, degenerative diseases, and fractures. Supplement for small defects. Cervical spinal fusion.	Prevents need for amputation. Accelerates, promotes, and allows healing. Restores mobility.
Rib	Used as a bone graft for jaw repair.	Restores normal facial appearance.
Achilles' tendon	Replaces ligament; used as rotator cuff; replaces Achilles' tendon.	Restores mobility; restores independence in activities of daily living.
Cartilage	Repairs congenital and traumatic facial deformity.	Restores normal facial appearance.
Ligaments	Rotator cuff used in shoulder repair. Used for bladder suspension.	Restores independence in activities of daily living.
Other Tissue		
Nerve (femoral, sural)	Neurosurgery in wrist.	Restores feeling and function of hand.
Skin	Grafts for burn victims; temporary graft to prevent infection, decrease pain, prevent heat and fluid loss, and reduce scarring until patient's skin regrows.	Promotes healing; natural barrier to infection.

Types of Donors

Status of Donor	Description	Type of Donation	Specific Donation
Brain Dead	When a person is pronounced dead after brain activity ceases. No possibility of resuscitation.	Organ and Tissue	<p>Most life-saving donations of major organs such as heart, lungs, kidneys, liver, pancreas, and intestine from deceased donors come from individuals who are brain dead.</p> <p>The heartbeat and breathing of a brain dead person can be temporarily maintained by a mechanical support system. This ensures the health of major organs by continuing the supply of blood and oxygen. (Typically donors have suffered a massive head trauma due to accident or stroke or other illness that has destroyed brain function.)</p> <p>Tissue transplants can be—</p> <ul style="list-style-type: none"> • life-saving—for example, a heart valve to treat vascular disease or repair a congenital birth defect or skin graft after severe burns. • life-enhancing—for example, a cornea to prevent blindness or bone, cartilage, and skin to treat trauma injuries, tumors, or degenerative diseases.
Cardiac Dead	When a person is pronounced dead after the heart stops beating and breathing stops and resuscitation attempts are unsuccessful.	Tissue—and in some cases—organs	<p>In most cases, organs from cardiac death individuals are unsuitable for donation because of the loss of blood flow and associated loss of oxygen, which leads to deterioration of the organ. (In 2002, approximately 3 percent of organs donated by deceased individuals came after cardiac death.)</p> <p>Tissues, on the other hand, are less vulnerable to oxygen starvation and can be recovered for 24 hours after the heart has stopped beating. This means as far as tissue donation there is no distinction between brain and cardiac dead donors. All transplantable tissues can be donated by both brain dead and cardiac dead donors.</p>
Living	In many cases, a relative or friend of the recipient or a person who chooses to be an anonymous donor.	Kidney or partial organ; bone marrow	<p>Kidney: Donating a single kidney carries minimal risk to living donors if they have normal kidney function prior to donation and no underlying health issues such as high blood pressure. Donor’s remaining kidney compensates by performing the function usually done by two kidneys. The risk to the donor is mostly the same as risk involved with any major surgery.</p> <p>Partial organ: lung lobe, liver lobe, or a part of the small intestine. Living donor’s liver regenerates and returns to full function, while a lung or intestine does not regenerate.</p> <p>Transplanted bone marrow can produce normal blood cells within 2–3 weeks and is a life-saving transplant for people with leukemia or cancers of the bone marrow. Only a small quantity of living donor’s bone marrow is removed. Remaining bone marrow regenerates.</p>



Rejection

Organ transplants not welcome here!

Rejection is the human body's reaction to a transplanted organ that it views as a foreign invader, much as it would a virus or bacteria. Our body treats a donor organ as if it were invading the body. The immune system springs into action the same way it does when the invader is a harmful microorganism. The immune system first distinguishes "self" from "non-self" by comparing proteins (antigens) on the surface of the "invader" with the body's own antigens.* Once a "non-self" invader is detected, cells called lymphocytes attack the "invader" antigens while other lymphocytes produce proteins called antibodies. The antibodies attack and help to destroy the invader.

No two people—except identical twins—have identical antigens. Therefore, organ transplantation will almost always cause an immune response and result in an attempt to reject the transplant. Kidneys seem to be more sensitive to rejection than other organs so tissue typing is done to ensure that the transplanted organ is as similar as possible to the tissues of the recipient. No match (other than an identical twin) is perfect, so the possibility of organ rejection remains. (See **Matching Donors With Recipients.**)

Once rejection is underway, things begin to go wrong inside the body of the recipient. The transplanted organ's functioning is impaired, and a variety of symptoms of illness develop.

The way to prevent or reduce rejection (other than a perfect match between donor and recipient) is to use immunosuppressive drugs—medicines that subdue the body's response to invaders.

*Because tissue typing is usually done on white blood cells, or leukocytes, the antigen markers are referred to as human leukocyte antigens, or HLA. Each cell has six major HLA antigens that are important to organ transplantation. Since each antigen exists in different people in as many as 20 varieties, the number of possible HLA types is about 10,000. The genes that encode the HLA antigens are located on chromosome 6 and are the subject of intense research.



Matching Donors With Recipients

Attack of the Antibodies

Each person has thousands of genes. The expression of those genes is what makes each of us a unique individual. Some of the effects of these genes are visible—displayed in features like hair color and eye color. However, many are not so obvious, but rather are expressed within our bodies in blood and tissue proteins. Some of these proteins, called antigens, determine the person’s tissue type. It is this uniqueness that makes matching donors with recipients so complex.

If you place an organ with a different tissue type into a recipient’s body, the recipient’s immune system goes on the offensive. Non-self antigens on the surface of the transplanted organ stimulate the production of T cells and of proteins called antibodies. The T cells and antibodies attack the organ and attempt to kill the organ’s cells. This process is called rejection, and may eventually destroy the organ completely. (See **Rejection**.)

Kidneys are Special

In matching a kidney donor and recipient, transplant professionals identify six antigens in each donor and recipient. These six antigens have been called the *major histocompatibility complex*. Compatibility refers to how closely a donor is matched with a recipient. “Histo” refers to tissue.

Ideal compatibility for kidney transplant is a six-antigen match between donor and recipient. A six-antigen match occurs 25 percent of the time between siblings (brothers and sisters) with the same mother and father. It also occurs from time-to-time in the general population. Other than the perfect match of identical twins, the six-antigen match is the single best tissue match that can occur between any donor and recipient in terms of the routine testing performed today. Because long-term survival after kidney transplantation depends on the quality of the match, the most successful long-term outcomes are between individuals who share all six antigens.

However, recent medical advances have made finding an ideal match between a kidney donor and recipient less crucial. Immunosuppressive drugs—medicines that can subdue the body’s response to a transplanted organ—have been improved greatly in the last few years. Today, these drugs are so effective that many transplant centers will consider transplants between some donors and recipients even if there is no tissue match between them. For now, although the best tissue match is still desirable, it is not absolutely necessary.

One last hurdle in matching a kidney donor and recipient must be cleared—a test called *crossmatching*. Crossmatching involves mixing cells from a potential donor with serum from the recipient. A positive crossmatch is a bad thing. It means that there are already antibodies in the recipient’s blood ready to attack the donor organ. Therefore, immunosuppressive drugs would not adequately prevent these antibodies from attacking the organ. With a few exceptions, a positive crossmatch makes a successful transplant between a particular donor/recipient pair impossible.



The Waiting List

The Organ Procurement and Transplantation Network

On average, every 13 minutes another name is added to the list of those in need of organ transplants; 18 people on that list die every day waiting for a suitable organ.

In 2002, about 25,000 people received an organ transplant. Yet at the end of that year nearly 80,000 people in the United States were still waiting for a suitable organ. By early-2004, the number of people on the waiting list had grown to over 84,000. Every year the gap between those waiting and the number of organs available is tremendous. Clearly, the question to be answered is: Who decides which person gets an organ?

In an attempt to create a fair system of organ distribution, Congress enacted the National Organ Transplant Act (NOTA) in 1984. NOTA created the Organ Procurement and Transplantation Network (OPTN), which includes all transplant centers, organ procurement organizations (OPOs), tissue-typing laboratories, many scientific organizations interested in transplantation, and representatives of the general public. OPTN activities are overseen by the Federal government and carried out by the United Network for Organ Sharing (UNOS) under a contract with the U.S. Department of Health and Human Services. UNOS maintains the OPTN's national list of people waiting for organ transplantation. Each person accepted into a transplant program is registered with the OPTN. Computers link transplant centers with each of the 59 regional OPOs across the United States and Puerto Rico. Each OPO serves the hospitals within its region and is responsible for the identification, evaluation, maintenance, removal, and transport of organs for transplant.

The OPTN network is accessible 24 hours a day, 7 days a week. When an OPO identifies a donor organ that has become available, the OPO accesses the UNOS' computers that link the OPTN network to generate a list of individuals who are potential recipients, ranked according to the OPTN policies on organ allocation.

Ranking

So, how does this computer system decide whose name appears first on the waiting list? When a person's name is added to the national waiting list, his or her medical profile is entered and stored in the OPTN network. The person is not placed on a ranked list at that time. Rather, the person's name is added to the pool of names of other people waiting for a transplant. When a donor organ becomes available, the computer system matches each individual in the pool against the donor's characteristics. Using medical and scientific criteria, the computer then generates a list of individuals ranked in order of which potential recipient is the best match. This process ensures that *all* individuals in the pool are compared to that particular donor before being ranked in the order of who makes the best

Background: The Waiting List

match. The following criteria are used to determine the best match:

- body size
- blood type
- time waiting
- medical urgency
- proximity of donor and potential recipient

Decision to Transplant

After receiving the printout of potential recipients, an OPO coordinator contacts the transplant-team physician responsible for the care of the individual who appears first on the list. The transplant physician decides whether this potential recipient and the donor organ are suitable for one another. The physician must consider whether the potential recipient is available, healthy enough to undergo major surgery, and willing to undergo a transplant immediately. A laboratory test to measure compatibility between the donor and potential recipient may be necessary. As soon as these steps have been taken, surgery is scheduled and the transplant occurs.

This organ sharing system is a diverse program that allows individuals on the waiting list to be matched with donated organs regardless of age, race, sex, or financial status. UNOS is constantly monitoring every organ allocation to ensure that all OPOs are distributing organs fairly.



Religious Views on Donation

The following information about the views of various religions on organ and tissue donation is reprinted with permission from the United Network for Organ Sharing (UNOS) and the Southeastern Organ Procurement Foundation (SEOPF). (*See citation provided below.)

Religious Views Concerning Organ and Tissue Donation

The death of a loved one often raises spiritual and religious issues. When faced with the decision of organ and tissue donation during the trauma of a family member's death, a person's religious group's position on the subject suddenly becomes very important. As the decision is being made, the question often arises, "What does my religious tradition believe about organ and tissue donation?" Recent surveys indicate that less than 10 percent of those surveyed were aware of their religious group's doctrine or position regarding organ and tissue donation. As a result, the decision maker often looks to his or her clergy person or hospital chaplain for an informed answer about a particular religious group's position.

No one person or even an assembly of religious representatives can speak for numerous religious groups, nor can any one document such as this speak for every sect. The "connectional" religious groups appear more likely to have official positions on subjects such as organ and tissue donation. The "free Church" traditions champion the idea that no group can usurp the autonomy of the local congregation. Thus, the religious group's official resolution is not binding on the local congregation or individual persons. It is, therefore, difficult to state an official position for some of the nation's larger religious groups. Research shows, however, that the vast majority of religious groups do support organ and tissue donation and transplantation so long as it does not impede the life or hasten the death of the donor.

Research into the positions of various religious groups reveals the underlying attitude that unless the group has taken action to prohibit organ or tissue donation and transplantation, it is usually assumed that such donation is permissible. It is encouraged as a charitable act that saves and/or enhances life; therefore, it requires no action on the part of the religious group. Although this is a passive approach to affirming organ and tissue donation and transplantation, it seems to be the position of a large segment of the religious community. Some groups have taken a more proactive stance in recent years, feeling that a resolution or adopted position encourages people to seriously consider the matter and plan accordingly. This segment appears to be increasing in number with only a few religious groups actively opposing organ and tissue donation and transplantation.

*Cooper, M.L., Taylor, G.J., eds. (2000). *Organ and Tissue Donation: A Reference Guide for Clergy*. 4th ed. Richmond, VA: SEOPF/UNOS.

NOTE: If a student requires information from a religious organization not listed in this material, suggest that he or she contact a faith leader of that organization. Please note that, while organ donation organizations make every attempt to secure accurate information, students may wish to consult their faith leader before making the decision to donate.

Background: Religious Views on Donation

Each congregational clergy person is encouraged to research his or her religious group's tradition and position on organ and tissue donation and transplantation, as well as other biomedical ethical issues. In addition, each clergy person should keep abreast of any new resolutions or positions adopted at his or her religious group's national assembly. The group's position is subject to change in any given year. It is important to be informed, since the family member is suddenly faced with making a decision concerning organ and tissue donation of a loved one and may be depending on the clergy to know the position held by his or her religious group. Inability to make an informed decision could leave the family member with a feeling of guilt regardless of the decision he or she may make.

The following summary statements concerning the various religious groups' positions on organ and tissue donation and transplantation may be of help to you. Perhaps you can help your religious group adopt a more clearly defined position.

Summary Statements of Various Religious Groups

AME & AME ZION (African Methodist Episcopal)

Organ and tissue donation is viewed as an act of neighborly love and charity by these denominations. They encourage all members to support donation as a way of helping others.

AMISH

The Amish will consent to transplantation if they believe it is for the well-being of the transplant recipient. John Hostetler, world-renowned authority on Amish religion and professor of anthropology at Temple University in Philadelphia, says in his book, *Amish Society*, "The Amish believe that since God created the human body, it is God who heals. However, nothing in the Amish understanding of the Bible forbids them from using modern medical services, including surgery, hospitalization, dental work, anesthesia, blood transfusions or immunization."

ASSEMBLY OF GOD

The Church has no official policy regarding organ and tissue donation. The decision to donate is left up to the individual. Donation is highly supported by the denomination.

BAPTIST

Though Baptists generally believe that organ and tissue donation and transplantation are ultimately matters of personal conscience, the nation's largest protestant denomination, the Southern Baptist Convention, adopted a resolution in 1988 encouraging physicians to request organ donation in appropriate circumstances and to "encourage voluntarism regarding organ donations in the spirit of stewardship, compassion for the needs of others and alleviating suffering." Other Baptist groups have supported organ and tissue donation as an act of charity and leave the decision to donate up to the individual.

BRETHREN

While no official position has been taken by the Brethren denominations, according to Pastor Mike Smith, there is a consensus among the National Fellowship of Grace Brethren that organ and tissue donation and transplantation is a charitable act so long as it does

not impede the life or hasten the death of the donor or does not come from an unborn child.

BUDDHISM

Buddhists believe that organ/tissue donation is a matter of individual conscience and place high value on acts of compassion. Reverend Gyomay Masao, president and founder of the Buddhist Temple of Chicago says, “We honor those people who donate their bodies and organs to the advancement of medical science and to saving lives.” The importance of letting loved ones know your wishes is stressed.

CATHOLICISM

Catholics view organ/tissue donation as an act of charity and love. Transplants are morally and ethically acceptable to the Vatican. According to Father Leroy Wickowski, Director of the Office of Health Affairs of the Archdiocese of Chicago, “We encourage donation as an act of charity. It is something good that can result from tragedy and a way for families to find comfort by helping others.” Pope John Paul II has stated, “The Catholic Church would promote the fact that there is a need for organ donors and that Christians should accept this as a ‘challenge to their generosity and fraternal love’ so long as ethical principles are followed.”

CHRISTIAN CHURCH (DISCIPLES OF CHRIST)

The Christian Church encourages organ and tissue donation, stating that we were created for God’s glory and for sharing God’s love. A 1985 resolution, adopted by the General Assembly, encourages “members of the Christian Church (Disciples of Christ) to enroll as organ donors and prayerfully support those who have received an organ transplant.”

CHRISTIAN SCIENCE

The Church of Christ Scientist does not have a specific position regarding organ donation. According to the First Church of Christ Scientist in Boston, Christian Scientists normally rely on spiritual instead of medical means of healing. They are free, however, to choose whatever form of medical treatment they desire—including a transplant. The question of organ/tissue donation is an individual decision.

EPISCOPAL

The Episcopal Church passed a resolution in 1982 that recognizes the life-giving benefits of organ, blood, and tissue donation. All Christians are encouraged to become organ, blood, and tissue donors “as part of their ministry to others in the name of Christ, who gave His life that we may have life in its fullness.”

GREEK ORTHODOX

According to Reverend Dr. Milton Efthimiou, Director of the Department of Church and Society for the Greek Orthodox Church of North and South America, “the Greek Orthodox Church is not opposed to organ donation as long as the organs and tissue in questions

Background: Religious Views on Donation

are used to better human life; i.e., for transplantation or for research that will lead to improvements in the treatment and prevention of disease.”

GYPSIES (ROMA)

Gypsies (Roma) are a people of different ethnic groups without a formalized religion. They share common folk beliefs and tend to be opposed to organ donation. Their opposition is connected with their beliefs about the afterlife. Traditional belief contends that for one year after death the soul retraces its steps. Thus, the body must remain intact because the soul maintains its physical shape.

HINDUISM

According to the Hindu Temple Society of North America, Hindus are not prohibited by religious law from donating their organs. This act is an individual’s decision. H.L. Trivedi, in *Transplantation Proceedings*, states that, “Hindu mythology has stories in which the parts of the human body are used for the benefit of other humans and society. There is nothing in the Hindu religion indicating that parts of humans, dead or alive, cannot be used to alleviate the suffering of other humans.”

INDEPENDENT CONSERVATIVE EVANGELICAL

Generally, Evangelicals have no opposition to organ and tissue donation. Each church is autonomous and leaves the decision to donate up to the individual.

ISLAM

The religion of Islam believes in the principle of saving human lives. According to A. Sachedina in his *Transplantation Proceedings* (1990) article, “Islamic Views on Organ Transplantation,” “the majority of the Muslim scholars belonging to various schools of Islamic law have invoked the principle of priority of saving human life and have permitted the organ transplant as a necessity to procure that noble end.”

JEHOVAH’S WITNESSES

According to the Watch Tower Society, Jehovah’s Witnesses believe donation is a matter of individual decision. Jehovah’s Witnesses are often assumed to be opposed to donation because of their belief against blood transfusion. However, this merely means that all blood must be removed from the organs and tissues before being transplanted.

JUDAISM

All four branches of Judaism (Orthodox, Conservative, Reform, and Reconstructionist) support and encourage donation. According to Orthodox Rabbi Moses Tendler, Chairman of the Biology Department of Yeshiva University in New York City and Chairman of the Bioethics Commission of the Rabbinical Council of America, “If one is in the position to donate an organ to save another’s life, it’s obligatory to do so, even if the donor never knows who the beneficiary will be. The basic principle of Jewish ethics—‘the infinite worth of the human being’—also includes donation of corneas, since eyesight restoration is considered a life-saving operation.” In 1991, the Rabbinical Council of America (Orthodox) approved organ donations as permissible, and even required, from brain-dead patients. The Reform movement looks upon the transplant program favorably and Rabbi

Richard Address, Director of the Union of American Hebrew Congregations Bio-Ethics Committee and Committee on Older Adults, states that “Judaic Responsa materials provide a positive approach, and by and large the North American Reform Jewish community approves of transplantation.”

LUTHERAN

In 1984, the Lutheran Church in America passed a resolution stating that donation contributes to the well-being of humanity and can be “an expression of sacrificial love for a neighbor in need.” They call on members to consider donating organs and to make any necessary family and legal arrangements, including the use of a signed donor card.

MENNONITE

Mennonites have no formal position on donation, but are not opposed to it. They believe the decision to donate is up to the individual and/or his or her family.

MORAVIAN

The Moravian Church has made no statement addressing organ and tissue donation or transplantation. Robert E. Sawyer, President, Provincial Elders Conference, Moravian Church of America, Southern Province, states, “There is nothing in our doctrine or policy that would prevent a Moravian pastor from assisting a family in making a decision to donate or not to donate an organ.” It is, therefore, a matter of individual choice.

MORMON (CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS)

The Church of Jesus Christ of Latter-Day Saints believes that the decision to donate is an individual one made in conjunction with family, medical personnel, and prayer. They do not oppose donation.

PENTECOSTAL

Pentecostals believe that the decision to donate should be left up to the individual.

PRESBYTERIAN

Presbyterians encourage and support donation. They respect a person’s right to make decisions regarding his or her own body.

SEVENTH-DAY ADVENTIST

Donation and transplantation are strongly encouraged by Seventh-Day Adventists. They have many transplant hospitals, including Loma Linda in California. Loma Linda specializes in pediatric heart transplantation.

SHINTO

In Shinto, the dead body is considered to be impure and dangerous, and thus quite powerful. “In folk belief context, injuring a dead body is a serious crime . . .,” according to E. Namihira in his article, “Shinto Concept Concerning the Dead Human Body.” “To this day it

is difficult to obtain consent from bereaved families for organ donation or dissection for medical education or pathological anatomy . . . the Japanese regard them all in the sense of injuring a dead body.” Families are often concerned that they not injure the itai, the relationship between the dead person and the bereaved people.

SOCIETY OF FRIENDS (QUAKERS)

Organ and tissue donation is believed to be an individual decision. The Society of Friends does not have an official position on donation.

UNITARIAN UNIVERSALIST

Organ and tissue donation is widely supported by Unitarian Universalists. They view it as an act of love and selfless giving.

UNITED CHURCH OF CHRIST

Reverend Jay Lintner, Director, Washington Office of the United Church of Christ Office for Church in Society, states, “United Church of Christ people, churches, and agencies are extremely and overwhelmingly supportive of organ sharing. The General Synod has never spoken to this issue because, in general, the Synod speaks on more controversial issues, and there is no controversy about organ sharing, just as there is no controversy about blood donation in the denomination. While the General Synod has never spoken about blood donation, blood donation rooms have been set up at several General Synods. Similarly, any organized effort to get the General Synod delegates or individual churches to sign organ donation cards would meet with generally positive responses.”

UNITED METHODIST

The United Methodist Church issued a policy statement regarding organ and tissue donation. In it, they state that, “The United Methodist Church recognizes the life-giving benefits of organ and tissue donation, and thereby encourages all Christians to become organ and tissue donors by signing and carrying cards or driver’s licenses, attesting to their commitment of such organs upon their death to those in need as a part of their ministry to others in the name of Christ, who gave his life that we might have life in its fullness.” A 1992 resolution states, “Donation is to be encouraged, assuming appropriate safeguards against hastening death and determination of death by reliable criteria.” The resolution further states, “Pastoral-care persons should be willing to explore these options as a normal part of conversation with patients and their families.”



Minority Health Issues

Would it surprise you to know that close to 50 percent of people on the transplant waiting list are minorities?* What accounts for this disproportionately large number of minorities needing organ transplants? Data indicate that certain minority groups are more likely to suffer from diseases that lead to a need for a life-saving organ transplant. For example, about one out of every three African Americans suffers from hypertension (high blood pressure); Type 2 diabetes is two times higher in Latinos than in Non-Latino Whites; Native Americans are four times more likely than Whites to suffer from diabetes. Both hypertension and diabetes can lead to kidney failure and the need for a new kidney. African Americans, Asian and Pacific Islanders, and Hispanics are three times more likely to suffer from kidney failure than Whites.

Add to these statistics the fact that while minorities donate in proportion to their representation in the population, only about 30 percent of all donors are minorities, and the transplant picture for minorities becomes even starker. For example, this imbalance between minority donors and potential recipients is bad news for minorities waiting for a kidney transplant for a very simple reason—they are likely to wait longer and possibly receive a kidney their bodies are more likely to reject. Why?

Despite recent advances in using immunosuppressive drugs to reduce rejection, tissue-matching is an important indicator of the success of a kidney transplant and is thus important in finding a compatible donor/recipient match. Research indicates that, generally, people of a particular race or ethnicity are more genetically similar to other people of the same race or ethnicity. However, the role of ethnicity and tissue-matching in rejection is still poorly understood and is the subject of on-going research.

Because of the reasons cited above, a minority on the waiting list may wait longer for a compatible match. The longer the wait, the greater the risk that the person will die before an organ is found. Many organizations are working through educational campaigns to increase awareness in minority communities of the need for organ donation. Increasing this awareness will encourage individuals to consider making the decision to donate their organs and give all those on the waiting list a better chance at receiving a life-saving organ transplant.

*Minorities as a percent of those on transplant waiting list:

African Americans—27 percent

Hispanic Americans—15 percent

Asian Americans—5 percent

American Indian or Alaskan Native—1 percent

Others—1 percent

Donation Saves Lives. . . Organ and tissue transplants save the lives of thousands of people each year and enhance the lives of many others. The average one-year survival rate for people receiving a heart, lung, kidney, or liver transplant ranges from 75-95 percent depending on the organ they received. (See **Transplantable Organs.**)

But Lives Are Lost Everyday Because Too Few

Donate. . . There is a waiting list for life-saving organ transplants. Unfortunately, due to a shortage of donated organs, many people die before a suitable organ becomes available. As of early-2004, over 84,000 people on the list were waiting for a life-saving organ transplant. Each day about 68 people receive an organ transplant, but another 18 people on the waiting list die because not enough organs are available. (See **The Waiting List.**)

Who Can Be a Donor? There are no age limitations on who can donate. Both newborns and senior citizens have been donors. Physical condition, not a person's age, determines suitability to be a donor. At the time of death, a person's medical condition is evaluated to determine if the person is suitable to be a donor.

How Do You Sign Up to Be a Donor? A person can declare his or her intention to be a donor in a variety of ways: donor registry, driver's license, or donor card. Most State laws allow minors of a certain age (for example, 16 and older) to declare an intention to be a donor with the written consent of a parent or guardian.

In some situations, the family of a deceased person must consent before their loved one's organs and tissues can be donated. One of the best ways to increase the chance that one will be a donor is to share one's wishes with immediate family members. This ensures that if family consent is required, your family will understand and be supportive of your wishes. (See **The Transplant Process.**)

Most donated organs are provided by people who are brain dead—that is, they have been pronounced legally dead. Living donors are able to donate bone marrow, a kidney, and parts of some organs. (See **Brain Death** and **Types of Donors.**)

Misconceptions . . . People worry that if medical personnel know that a person wishes to be a donor it is less likely that everything possible will be done to save the person's life. This is not true. Medical personnel always take every possible step to save a person's life.

In addition, people might believe that an organ and tissue donor cannot have an open-casket funeral. This is also untrue. Organ and tissue removal is done in such a way that an open-casket funeral is still possible.

Some people believe that a wealthy or well-connected person has a better chance of receiving a life-saving organ transplant. This is not true. Decisions about who receives an available organ are based solely on medical and scientific criteria. The wealth, age, race, or gender of a person on the waiting list has no effect on when an individual will receive a donated organ. In addition, it is illegal to buy or sell human organs in the United States. (See **Common Questions and Misconceptions.**)

This page is only a summary of some of the important material found in the Background sections of this guide. We strongly suggest that you review those materials before teaching the Core Lesson. The Background is divided into three sections:

A. Overview

The Transplant Process, p. 21

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Medical Applications of Donated Tissues, p. 38

Types of Donors, p. 39

Rejection, p. 40

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C. Donation Issues

Religious Views on Donation, p. 44

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A nonprofit organization under contract with the U.S. Department of Health and Human Services maintains a computerized national waiting list of patients who need a life-saving organ transplant.



The hospital notifies the local organ procurement organization (OPO) of imminent death of patient. (An OPO is a nonprofit organization that coordinates organ donation and transplantation in a specific geographic area.)

After the patient's death, the donor's organs are kept oxygenated by a mechanical support system while deceased's donation intentions are verified and/or family consent is obtained.



The OPO verifies the medical suitability of the patient to be a donor.

Once the deceased person is declared a donor, the computerized waiting list system matches the donor's characteristics, such as body size, blood type, geographic location, against each person on the waiting list.



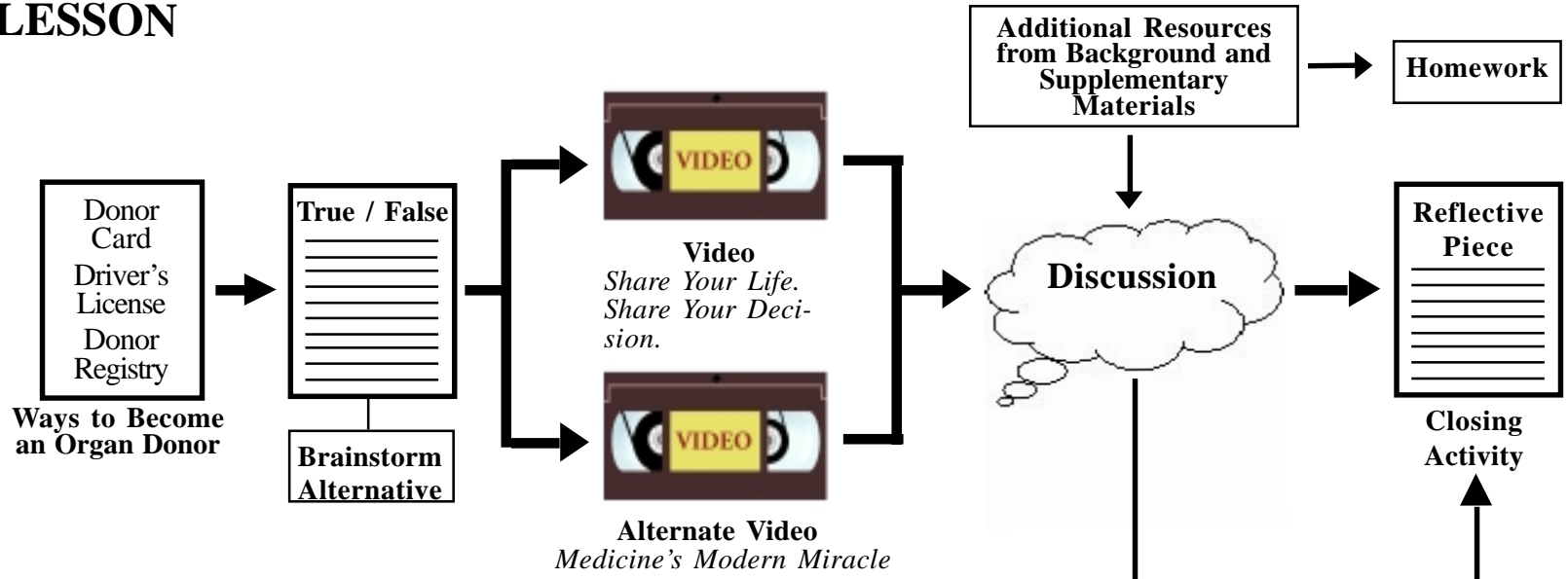
After a suitable recipient is identified, the recipient's medical team is contacted. Arrangements are made to remove the donated organ and transport it to the recipient's hospital where the life-saving organ is transplanted into the recipient.

The organ removal is a surgical operation handled with sensitivity. The donor's family is able to make funeral arrangements (including an open-casket funeral) with very little delay.



Recipient undergoes period of recovery.

CORE LESSON



ADDITIONAL LESSONS

