

## How to Use This Guide

## II.

*Decision: Donation* provides teachers and schools with a guide to help high school students make an informed decision as to whether to become an organ and tissue donor *and* to encourage students to then communicate their donation wishes to immediate family members. We suggest that you review all the materials before deciding what to use with your classes and that you share these materials with other teachers in your school. An online version of this guide is available in PDF format at [www.organdonor.gov](http://www.organdonor.gov).

The materials in this package are designed to allow teachers and schools to integrate the topic of organ and tissue donation into their subject curriculum. However, the most effective approach to teaching this topic is to integrate it into *all* curriculum areas in your school, so you are strongly encouraged to discuss this approach with your colleagues. (See Appendix A for a list of national education standards relevant to organ and tissue donation.)

Opportunities for integration are provided through activities suitable for use in driver's education, health education, biology, social studies, English, and mathematics classes. Some of these materials can be used in any of these subject areas while others are intended for specific subject areas. A list identifying materials by subject area is provided at the end of this section. In addition, the following icons are used at the upper corner of the first page of each component to indicate appropriate subject area:



**Driver's Education**



**Science / Biology**



**Social Studies**



**Health Education**



**Mathematics**



**English**

This package consists of both print and video materials. The videos are intended to be used in the core lesson for all students—**Share Your Life. Share Your Decision.** The print materials are divided into the following sections:

- Background
- Lesson Activities
- Supplementary Materials
- Web Activities
- Appendices
- Glossary

**NOTE:** Your local organ procurement organization (OPO)—a Federally designated nonprofit organization responsible for coordinating organ donation in your area—may have an ongoing relationship with your school. OPOs often have experienced and talented community educators and speakers who provide valuable educational programs on donation and transplantation.

We encourage you to continue these activities if you presently have such a relationship with your local OPO. We also encourage you to use materials in this guide to support those ongoing education programs. You can locate your local OPO at: [www.organdonor.gov/OPO.htm](http://www.organdonor.gov/OPO.htm)

**NOTE:** Many of the materials are suitable for use in a number of different subject areas and therefore are designated with more than one icon.

## Background

The **Background** contains information targeted primarily at you, the teacher. However, much of the background information may also be used by your students. We encourage you to duplicate those components for use in your classroom. We recommend you carefully read all the information provided to determine which materials are appropriate for your students. The Background is divided into three sections:

**Overview of Organ and Tissue Donation:** Reading this section before you start teaching this topic is essential. It provides the *minimum* information needed to understand the transplant process and to address common student questions and concerns about organ and tissue donation.

**Science:** This section provides information on the science of organ transplantation and the problems of rejection and matching donors and recipients. Biology and health teachers might find this section especially useful. Included are illustrations and information on the medical applications of organs and tissues that are commonly transplanted. These pages can be used to make transparencies.

**Donation Issues:** This section contains information on religious views on organ and tissue donation. Because the issue of religious considerations often arises in discussions with students, this material is important reading for the teacher. This section also provides important information on the impact of health conditions in minority populations on the donation and transplantation process.

## Lesson Activities

This section provides you with specific materials for conducting your lesson activities on organ and tissue donation. Donation can be a sensitive topic for students and families. A sample letter informing parent and guardians that you plan to teach this topic is provided (see black-line master at the end of this section). It is recommended that you send this letter home with students about one week before beginning these donation lessons and activities.

The folder in the center of this guide contains the 45-minute **Core Lesson—Share Your Life. Share Your Decision**. This lesson can be used in any curriculum setting either as a stand-alone lesson for classes that have only one class period available for the topic or as an introductory lesson that leads into additional lessons and activities.

Also included in the folder is a summary of some important information from the Background, a flowchart of how the additional lessons and activities in this guide can be integrated into different subject-matter instruction in your school, and a chart outlining the transplant process.

**Videos:** The videos included in this package are an integral part of the core lesson. The videos are provided to help you tailor the video component to the needs of your students:

- *Share Your Life. Share Your Decision* (16 minutes) is designed to be used with students who only have a short time to study the topic. It provides a nontechnical review of the donation and transplant process from the viewpoint both of donor families and recipients.

**NOTE:** Be sure to plan ahead to get necessary administrative approval for sending this letter home.

**NOTE:** These videos are preceded by a 3-minute edition of the Emmy- and Freddie-winning video, *No Greater Love*, which includes a message from HHS Secretary Tommy G. Thompson.

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- *Medicine's Modern Miracle* (23 minutes) reviews the same issues, but provides slightly more technical information appropriate for students either currently studying or with some knowledge of biology.
- *No Greater Love* (15 minutes) Clip from the hour-long documentary narrated by Angela Lansbury and featuring Health and Human Services Secretary Tommy Thompson. The film shows the healing that may come through the act of donation. The goal is to encourage families to discuss the issue of donation, as well as make their wishes known to their loved ones.

We urge you to view all of the videos. In addition to helping you select the one best suited to your students, viewing both will provide you with additional information useful in teaching organ and tissue donation.

The Core Lesson contains a preassessment activity that will give you an understanding of your students' knowledge about donation before you teach the materials included in this guide. If this is the only lesson dedicated to the topic, the closing activity (see below) should be done at the end of this lesson. Full details on how to conduct this lesson are provided in the core lesson plan.

The remaining lessons in this section target different subject areas (**Biology, English, Social Studies, and Mathematics**) and each lesson includes a comprehensive lesson plan that can be supplemented with additional materials from the Background or Supplementary Materials. Some can be used in more than one place in the school curriculum. Refer to the flowchart in the Core Lesson folder for suggestions as to where these lessons can be used.

The closing activity of the core lesson should be done by all students as they complete the topic. An important instructional goal is to encourage students to share their views on donation with family members. Therefore, the closing activity is a private, reflective activity in which students draft a letter to their parents/guardians. Students are encouraged to take the letter home to share and discuss with their families.

### Supplementary Materials

This section contains print resources for enhancing the lesson activities. Many are suitable for use as homework exercises. Additional suggestions for their use are provided at the beginning of this section.

### Web Activities and Resources

This section describes companion resources and activities available at [www.organdonor.gov](http://www.organdonor.gov)—the official donation Website of the U.S. Department of Health and Human Services.

### Appendices and Glossary

The appendices contain references to subject-specific national education standards relevant to the materials in this guide and also provide additional video and web resources and a glossary of terms associated with organ and tissue donation and transplantation.

**NOTE:** While the core lesson has been designed for a 45-minute class period, the topic of organ and tissue donation is an important one. You are strongly urged to consider spending two 45-minute periods or one block-schedule period to teach the core lesson.

This extra class time would allow a fuller discussion of student questions and concerns and would allow students to use class time to complete a reflective piece on their views on donation to be shared with family members rather than do this important step of the curriculum as a homework assignment.

**NOTE:** Many of the materials and lessons in this guide can be used in a variety of subject areas. This chart lists the specific materials that may be used in respective subject areas.



### Driver's Education

The Transplant Process  
 Common Questions and Misconceptions  
 Brain Death  
 A Decision to Share  
 Careers Associated With Transplantation  
 Community/Service Learning Activities



### Science / Biology

Biology Lesson: Finding a Match  
 The Transplant Process  
 Common Questions and Misconceptions  
 Transplantable Organs  
 Transplantable Tissues  
 Medical Applications of Donated Tissues  
 Brain Death  
 Types of Donors  
 Rejection  
 Matching Donors With Recipients  
 The Waiting List  
 Minority Health Issues  
 Donation Crossword  
 A Decision to Share  
 Transplantation Timeline  
 Follow-up Questions for *Medicine's Modern Miracle* Video  
 Careers Associated With Transplantation  
 Community/Service Learning Activities



### English

English Lesson: The Ultimate Gift  
 The Transplant Process  
 Common Questions and Misconceptions  
 Donation Crossword  
 A Decision to Share  
 Transplantation Timeline  
 Careers Associated With Transplantation  
 Community/Service Learning Activities



### Health Education

The Transplant Process  
 Common Questions and Misconceptions  
 Brain Death  
 Transplantable Organs  
 Transplantable Tissues  
 Medical Applications of Donated Tissues  
 Types of Donors  
 The Waiting List  
 Minority Health Issues  
 A Decision to Share  
 Donation Crossword  
 Transplantation Timeline  
 Follow-up Questions for *Medicine's Modern Miracle* Video  
 Careers Associated With Transplantation  
 Community/Service Learning Activities



### Social Studies

Social Studies Lesson: Donation Debate  
 The Transplant Process  
 Common Questions and Misconceptions  
 Transplantation Timeline  
 Religious Views on Donation  
 Minority Health Issues  
 The Waiting List  
 A Decision to Share  
 Transplantation Timeline  
 Careers Associated With Transplantation  
 Community/Service Learning Activities



### Mathematics

Mathematics Lesson: Are Things Getting Better?  
 The Transplant Process  
 Common Questions and Misconceptions  
 A Decision to Share  
 Careers Associated With Transplantation  
 Community/Service Learning Activities

Dear Parent/Guardian:

Your son/daughter's \_\_\_\_\_ class will be learning about organ and tissue donation and transplantation. The goals of this lesson are:

- to provide students with basic information for making an informed decision as to whether to be an organ and tissue donor.
- to encourage students to discuss this important topic with their parent(s) or guardian(s).
- to raise awareness of organ and tissue donation and the ability of transplants to save lives in the hope of increasing the number of individuals who consider the option of donation.

In the next few days, your son/daughter will probably express a wish to discuss these issues with you. Please take some time as a family to discuss this issue and review any information your son/daughter brings home. It is very important for family members to be aware of one another's donation wishes because the legal next-of-kin may be asked for consent at the time of a loved one's death.

Even though it may feel a little uncomfortable, a family discussion about organ and tissue donation now could someday make a decision about donation easier for your family. Many families faced with this decision have shared that they wished they had known how their loved one felt about organ and tissue donation. A brief family discussion will allow each member of your family to share his or her wishes regarding donation.

After a family discussion, each person who wants to be a donor can indicate his or her specific wishes by completing a donor card, indicating his or her intent on a driver's license, or joining a donor registry if one is available in your State.

You are welcome to contact me for further information by phone at \_\_\_\_\_

or by e-mail at \_\_\_\_\_.

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Teacher's Signature

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Date



### 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](http://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 minor's wishing to be a donor, visit [www.organdonor.gov/opo.htm](http://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](http://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**.)

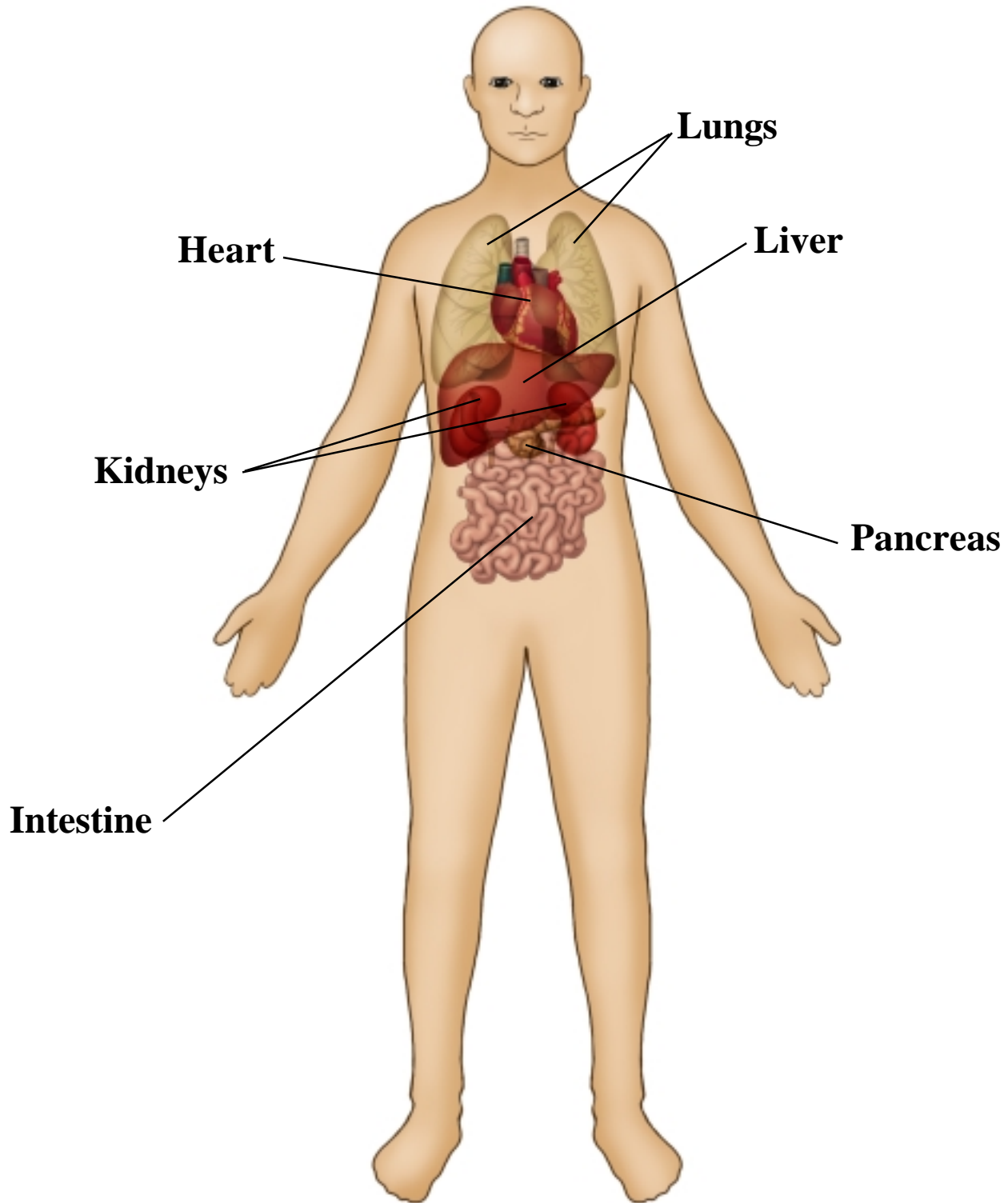
It is helpful for you and your family to understand the nature of brain death before you make the decision to become a donor. Your brain needs oxygen to keep working. When the brain is injured it swells. This swelling can prevent blood from entering the brain. When blood—which carries oxygen to the brain—stops 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.

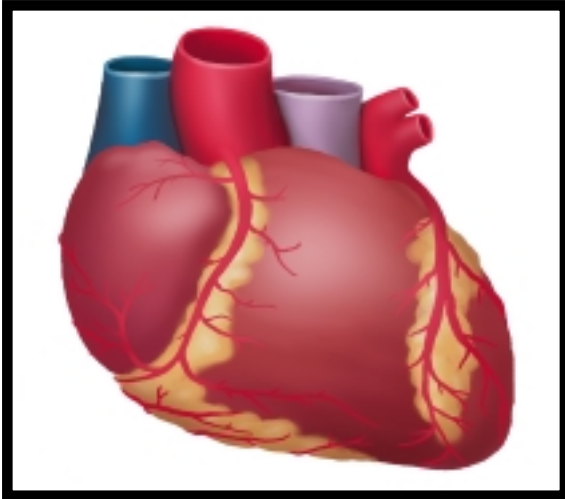
Several medical professionals perform a number of tests at separate times before a person is pronounced brain dead. If these tests prove that brain death has occurred, the body is kept on mechanical support to maintain the organs until it is determined whether the person will be a donor.



## 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.



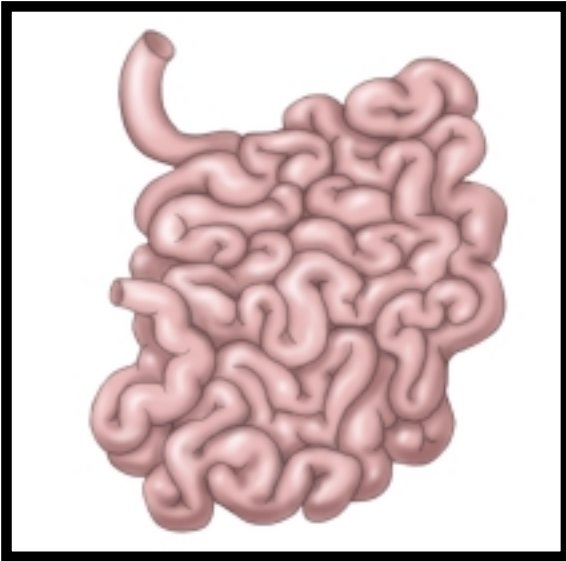
### Diseases and Disorders

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

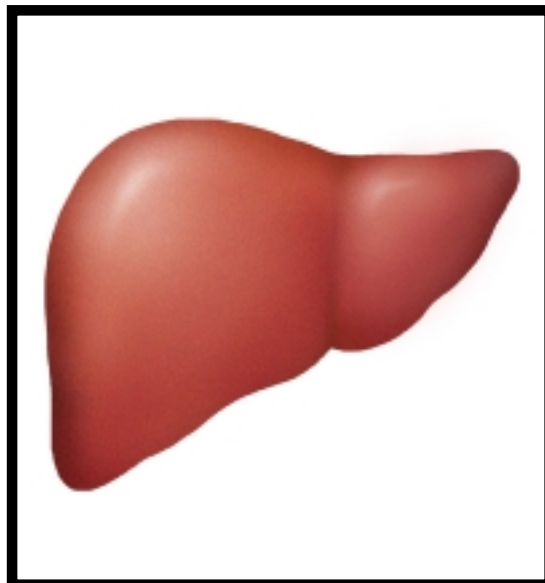
Intestine transplants are required when the intestine becomes twisted and blocked or when there is irreversible intestinal failure. Most cases of intestinal failure are caused by short-gut syndrome (a significant loss of length of the small intestine present at birth or as a result of surgical removal 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.