# Contents

## CHAPTER 1  ORGAN AND TISSUE DONATION IN AUSTRALIA

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why do people need transplants?</td>
<td>1</td>
</tr>
<tr>
<td>History of organ and tissue transplantation</td>
<td>4</td>
</tr>
<tr>
<td>Organ donation: the Australian Organ Donor Register</td>
<td>6</td>
</tr>
<tr>
<td>How the waiting lists operate</td>
<td>7</td>
</tr>
<tr>
<td>Latest organ donation figures show record high</td>
<td>8</td>
</tr>
<tr>
<td>Myths and misconceptions about donation</td>
<td>9</td>
</tr>
<tr>
<td>Organ and tissue donation – frequently asked questions</td>
<td>12</td>
</tr>
<tr>
<td>Donation myths</td>
<td>14</td>
</tr>
<tr>
<td>Making a decision about organ and tissue donation after death</td>
<td>16</td>
</tr>
<tr>
<td>Discussing donation</td>
<td>17</td>
</tr>
<tr>
<td>Transplanting our mindset on organ donation</td>
<td>19</td>
</tr>
<tr>
<td>Grief reactions associated with organ donation</td>
<td>20</td>
</tr>
</tbody>
</table>

## CHAPTER 2  ETHICS OF ORGAN DONATION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it time to make organ donation compulsory?</td>
<td>21</td>
</tr>
<tr>
<td>Organ donation: opt-out system is not the answer</td>
<td>22</td>
</tr>
<tr>
<td>Opt-out organ donation system</td>
<td>23</td>
</tr>
<tr>
<td>Organs and presumed consent: a case study</td>
<td>25</td>
</tr>
<tr>
<td>Organ donation is just that – a gift from one to another</td>
<td>26</td>
</tr>
<tr>
<td>Religious rulings</td>
<td>27</td>
</tr>
<tr>
<td>Organ donation after death: the debate</td>
<td>30</td>
</tr>
<tr>
<td>Organ transplantation and the dead donor rule</td>
<td>32</td>
</tr>
<tr>
<td>Death fiction and taking organs from the living</td>
<td>34</td>
</tr>
<tr>
<td>Our final consideration</td>
<td>35</td>
</tr>
<tr>
<td>An end and a beginning</td>
<td>36</td>
</tr>
<tr>
<td>The ethics of living donation</td>
<td>38</td>
</tr>
<tr>
<td>Body parts for sale</td>
<td>40</td>
</tr>
<tr>
<td>Australian organ tourists drive sinister trade</td>
<td>42</td>
</tr>
<tr>
<td>Frequently asked questions: xenotransplantation</td>
<td>43</td>
</tr>
<tr>
<td>Xenotransplantation: a pig issue</td>
<td>46</td>
</tr>
</tbody>
</table>

**Exploring issues – worksheets and activities**  
**Fast facts**  
**Glossary**  
**Web links**  
**Index**
Organ and Tissue Donation is Volume 333 in the 'Issues in Society' series of educational resource books. The aim of this series is to offer current, diverse information about important issues in our world, from an Australian perspective.

KEY ISSUES IN THIS TOPIC
Organ and tissue transplants can be the last resort for a range of life-saving and life-improving treatments. This opportunity usually only becomes available when someone donates their organs or tissues upon their death. Although the latest organ donation figures have reached a record high, the total however, only equates to a national organ donor rate of 13.8 per million, which suggests more can be done to help Australians who are on transplant waiting lists.

This book addresses the misconceptions and facts about organ and tissue donation and registration with the aim of raising community awareness in an effort to boost donation rates. It also explores a range of ethical issues around consent and objection, such as ‘opt-out’ system proposals, religious considerations, the brain death debate, altruistic living tissue and organ donation, the illegal market in body parts, and animal to human transplantation (xenotransplantation). What does it take to give the gift of life?

The topic is presented in two chapters: Organ and tissue donation in Australia; Ethics of organ donation.

SOURCES OF INFORMATION
Titles in the ‘Issues in Society’ series are individual resource books which provide an overview on a specific subject comprised of facts and opinions.

The information in this resource book is not from any single author, publication or organisation. The unique value of the ‘Issues in Society’ series lies in its diversity of content and perspectives.

The content comes from a wide variety of sources and includes:
➤ Newspaper reports and opinion pieces
➤ Website fact sheets
➤ Magazine and journal articles
➤ Statistics and surveys
➤ Government reports
➤ Literature from special interest groups

CRITICAL EVALUATION
As the information reproduced in this book is from a number of different sources, readers should always be aware of the origin of the text and whether or not the source is likely to be expressing a particular bias or agenda.

It is hoped that, as you read about the many aspects of the issues explored in this book, you will critically evaluate the information presented. In some cases, it is important that you decide whether you are being presented with facts or opinions. Does the writer give a biased or an unbiased report? If an opinion is being expressed, do you agree with the writer?

EXPLORING ISSUES
The ‘Exploring issues’ section at the back of this book features a range of ready-to-use worksheets relating to the articles and issues raised in this book. The activities and exercises in these worksheets are suitable for use by students at middle secondary school level and beyond.

FURTHER RESEARCH
This title offers a useful starting point for those who need convenient access to information about the issues involved. However, it is only a starting point. The ‘Web links’ section at the back of this book contains a list of useful websites which you can access for more reading on the topic.
WHY DO PEOPLE NEED TRANSPLANTS?

Every day people need transplants, from the very young to the very old. Resource sheet information from Transplant Australia

WHY DO PEOPLE NEED ORGAN AND TISSUE TRANSPLANTS?

Every day people need transplants, from the very young to the very old. This can be the last resort of lifesaving treatment or for life-improving treatments. This opportunity only becomes available, when someone donates their organs or tissues upon their death. The next of kin can make the choice to donate if the individual’s wishes aren’t known.

Some people need transplants because:

➤ They were born with a structural abnormality of an organ such as a congenital heart defect or biliary atresia. Biliary atresia is one of the most common reasons that a child might require a liver transplant – the bile duct has failed to develop

➤ They were born with a disease that causes an organ to fail. This might be an inherited disorder such as cystic fibrosis

➤ They have been unlucky enough to develop a disease or illness that caused an organ to fail. For some people, simply catching a cold or flu can result in them requiring a heart transplant for cardiomyopathy, a disease that severely affects the heart muscle’s ability to contract.

In some respects, people with kidney failure are a little more fortunate. A dialysis machine can take over some of the functions of the kidney while they wait for their transplant. People with diseases affecting their heart, lung, liver or pancreas do not (at this stage) have biomedical devices available to them to replace the functions of their failed organs. A transplant is their only option.

Fact: Not everyone with end stage organ failure is suitable to receive a transplant – potential recipients are evaluated extensively and only those for whom transplantation is likely to be successful are considered.

To be considered for a transplant someone must:

➤ Have a condition for which transplantation is considered an effective treatment

➤ Have severe and progressive disease that no longer responds to medical treatment and may be fatal

Fact: In Australia, a person has a 10 times greater chance of requiring an organ or tissue transplant than of becoming a donor. Organ donation is medically possible in less than 1 per cent of all deaths that occur.

What types of transplant are there?

There are two ways people can donate:

1. Organ and tissue donation after death, and
2. Living donation (while you are alive).

1. ORGAN AND TISSUE DONATION AFTER DEATH

Organs that can be transplanted include heart, lungs, liver, kidneys and pancreas.

Tissues that can be transplanted include eye tissue, heart valves, skin and bone tissue.

ORGAN TRANSPLANTATION

Liver transplantation

The liver is the body’s largest organ and is essential...
in keeping it working properly – you can’t live without a functioning liver. It removes or neutralises poisons, germs and bacteria from the blood and produces immune agents to control infection. It makes proteins that regulate blood clotting and produces bile to help absorb fats and fat-soluble vitamins. In liver transplantation, surgery is performed to remove a diseased liver and replace it with a healthy liver from an organ donor. A liver transplant is necessary when disease stops the liver from working. There are more than 60 diseases of the liver for which someone may require a transplant. The most common reason for liver transplantation in adults is cirrhosis, a disease in which healthy liver cells are killed and replaced with scar tissue blocking the flow of blood through the organ and preventing it from working as it should. The most common reason for transplantation in children is biliary atresia, where the ducts that carry bile out of the liver are missing or damaged.

In Australia, a person has a 10 times greater chance of requiring an organ or tissue transplant than of becoming a donor.

**Lung transplantation**

Every cell in your body requires oxygen to do its job. When a cell uses oxygen, it produces carbon dioxide which has to be removed quickly. In a healthy person there is a constant, steady flow of oxygen to cells and carbon dioxide away from cells and out of the body. The lungs have the important job of providing the oxygen the body needs and expelling the carbon dioxide. If the lungs are so badly damaged that even extra oxygen and artificial breathing assistance are inadequate, lung transplantation may be indicated. Lung transplantation involves removal of one or both diseased lungs from a patient and the replacement of the lungs with healthy organs from a donor. Lung transplantation may refer to single, double, or even heart-lung transplantation.

**Heart transplantation**

The heart is a muscle and a pump that receives un-oxygenated blood from the body. Blood enters the first two chambers of the heart and travels through the lungs, where it is oxygenated. After oxygenation, blood leaves the lungs, travels through the other two chambers before being ejected out of the heart to the rest of the body. When the heart muscle is injured it affects how well blood can pump around the body.

The two most common problems that damage the heart muscle are coronary artery disease and cardiomypathy. Coronary artery disease refers to the build-up of plaque in the arteries and predominantly affects adults. When the plaque blocks an artery, blood cannot get to part of the heart muscle which in turn, is injured. This can affect how the heart muscle contracts, or pumps. Cardiomyopathy means disease of the heart muscle. Affecting both children and adults, it damages the heart’s muscle tone and reduces its ability to pump blood to the rest of the body. As these heart problems get worse, the heart grows weaker but has to work harder and is able to pump less oxygenated blood. It tries to make up for this by becoming enlarged and in time may ‘wear out’. Some people also need heart transplants because of congenital heart defects. These are structural problems with the anatomy of the heart which cause abnormal blood flow, contraction and oxygenation.

**Kidney transplantation**

Healthy kidneys clean the blood by removing excess fluid, wastes and minerals. They also make hormones that regulate blood pressure and keep bones strong and blood healthy. Dialysis and drugs can replace some of these functions. There are many diseases which cause the kidneys to fail. These may be acute or chronic. Diabetes often results in renal failure. Nephropathy, meaning disease of the kidney, can also be caused by glomerulonephritis, an inflammatory kidney disease, polycystic disease, toxins produced by viruses, bacteria and some drugs and structural defects.

**Pancreas transplantation**

Pancreas transplantation is a treatment for patients with diabetes. It is performed to prevent, halt or reverse problems that can arise after years of living with the disease. The pancreas has cells called Islets of Langerhans which secrete insulin and control the body’s sugar levels. Many people with diabetes eventually develop complications of the disease, which affect their vision, foot and leg sensation, heart and circulation, and kidney function. With advanced kidney disease, transplantation maybe an option and for this reason the pancreas is usually transplanted with a kidney. It is also possible to isolate the islet cells from the donated pancreas. These are infused into the liver and the cells secrete insulin.

**TISSUE TRANSPLANTATION**

**Eye tissue (corneal)**

Corneal transplantation is surgery to replace the clear, dome-shaped surface on the front of the eye. The cornea is the eye’s outermost layer and must remain transparent to refract light properly. Corneal transplants are generally performed either to improve vision, to preserve the eye through reconstructing the cornea or to treat painful diseases or trauma.

**Heart valves**

These regulate the flow of blood to and from the heart, which has four chambers: two atria, or upper chambers, and two ventricles, or lower chambers. Blood passes through a valve before leaving each chamber and it is these valves that prevent the backward flow of blood. The valves are actually flaps and there are four of them – the tricuspid, mitral, pulmonary and aortic. Valves can malfunction in several ways: they may not have developed at all; the valve opening may be too narrow; or the valve doesn’t close completely. When any of these things happen, the implications for the heart can be serious, possibly hampering its ability to pump blood adequately through the body.
Malfunctioning valves can be replaced with mechanical valves or valves made from animal tissue. However, many people cannot tolerate the blood thinning medication required for these valves. For this reason, the best option for repairing heart valves is through human donation. Human heart valves are especially important for young women of child-bearing age, because they do not need drugs to maintain a healthy valve transplant and can have children without complications.

Musculoskeletal tissue

Bone is one of the most commonly donated tissues used for transplantation. The majority of donor bone in Australia is obtained from living donors – in particular, patients undergoing total hip replacement. There is also a requirement for specific bones that can only be obtained from people who have died. The most common reason for bone donation is failed joint replacement surgery. But it is also needed for reconstruction following surgery for trauma or cancer which can prevent a possible limb amputation or allow mobility and movement after trauma surgery repair. Structures that support bone and muscle, such as tendons, are also needed.

Skin

This refers to the grafting of skin from one site to another to replace a lost portion of the body surface skin. Skin functions as a protective barrier against micro-organisms and has the ability to regenerate. It acts as an insulator against heat and cold, provides nutrients and helps eliminate waste in the form of perspiration. Skin is extremely important in the healing process of burns victims. Though most transplant procedures carry the risk of rejection, this risk is markedly reduced with tissue transplants because unlike organs, tissues have a limited blood supply.

Blood donation

This is the most common donation because blood constantly regenerates. Clinical need obviously drives demand as well. A single blood donation can contribute to the formulation of up to eight different products. People who need blood transfusions include accident victims, patients undergoing surgery, organ and bone marrow transplant recipients and those undergoing treatment for leukaemia. Generally, anyone who is aged between 16-70 years, weighs at least 45 kilos, is in good health, and meets the guidelines, can donate blood.

Bone marrow

This can also be donated by a living person and regenerates in the donor. Bone marrow is the spongy tissue found inside bones. The marrow in the skull, hips, ribs, and spine contains stem cells which produce the bone cells. These include white cells, which fight disease and infection, and red cells, which carry oxygen and platelets to enable blood clotting. Bone marrow transplants are used to treat leukaemias, lymphomas and some cancers. Traditionally, siblings are the ideal donors for some treatments and tissue typing is very important to find the best match for the potential recipient.

Cord blood

Cord blood is the blood left behind in the placenta and umbilical cord and is usually discarded after childbirth but donation is an option. Research has shown that cord blood is rich in blood-forming stem cells known as haemopoietic stem cells. It is collected from the umbilical cord and placenta at no risk either to the mother or baby. It is tested and tissue typed before being made available for transplantation.

Kidney

Kidney donation can also be performed by a living donor. Most people have two kidneys from birth and a person can live and function normally with only one kidney.

Living kidney donation is predominantly between family members as tissue compatibility is very important. But it can also be performed from a living unrelated donor such as a spouse or friend, providing they can be matched.

Bone

Bone tissue can also be donated while the donor is alive. After blood, bone is the second most commonly transplanted tissue. It has been estimated that between 200,000 and 300,000 people worldwide receive bone transplants each year; more than 25 times the number of people who undergo kidney transplants and 100 times the number who undergo heart transplants. Living bone tissue donation is usually from patients who require total hip replacement surgery, where the hip joint is replaced with prosthesis.

Is transplantation successful?

Australia boasts one of the highest transplantation success rates in the world. Kidney transplant survival rates are about 90% in the first year and over 75% in five years. Patient survival rates for heart and liver transplantation are also 90% in the first year and 85% after five years. Pancreas transplants have the highest survival rate of 94% at one year and 87% at five years. Tissue transplantation is also extremely successful with most recipients who, at the very least, are able to enjoy improved quality of life.

How long do people wait?

Transplant waiting times vary widely and depend upon availability of suitable organs. Though waiting times for corneal grafts tend to be a few months, individuals waiting for organ transplants can wait an average of one to three years for their life-saving transplant.
History of organ and tissue transplantation

The history of successful organ and tissue transplantation is only a century old, but is marked by many milestones that have saved many lives. Australia has been a leader in pioneering liver transplantation. A fact sheet from DonateLife – the Australian Organ and Tissue Donation and Transplantation Authority

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MILESTONE</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>1823</td>
<td>First skin auto graft transplantation of skin tissue from one location on an individual's body to another location</td>
<td>Germany</td>
</tr>
<tr>
<td>1905</td>
<td>First human-to-human corneal transplant. This was also the first successful human-to-human transplant of any kind</td>
<td>Moravia (now Czech Republic)</td>
</tr>
<tr>
<td>1908</td>
<td>First skin allograft transplantation of skin from a donor to a recipient</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Early 1940’s</td>
<td>Australia begins corneal transplants</td>
<td>Sydney and Melbourne</td>
</tr>
<tr>
<td>1954</td>
<td>First living related kidney transplant (identical twins)</td>
<td>USA</td>
</tr>
<tr>
<td>1955</td>
<td>First heart valve allograft into descending aorta</td>
<td>Canada</td>
</tr>
<tr>
<td>1962</td>
<td>First kidney transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1965</td>
<td>Australia’s first successful (living) kidney transplant</td>
<td>Queen Elizabeth Hospital, SA, Australia</td>
</tr>
<tr>
<td>1967</td>
<td>First successful liver transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1968</td>
<td>First heart transplant</td>
<td>South Africa</td>
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<tr>
<td>1979</td>
<td>Living related pancreas (mother to child)</td>
<td>USA</td>
</tr>
<tr>
<td>1981</td>
<td>First heart/lung transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1983</td>
<td>First successful lung transplant</td>
<td>Canada</td>
</tr>
<tr>
<td>1983</td>
<td>Cyclosporine approved for commercial use in USA. A revolutionary anti-rejection drug, it heralded a new era for kidney, liver and heart transplantation</td>
<td>USA</td>
</tr>
<tr>
<td>1984</td>
<td>First heart-liver transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1984</td>
<td>Australia’s first successful heart transplant</td>
<td>St Vincent’s Hospital, NSW, Australia</td>
</tr>
<tr>
<td>1985</td>
<td>Australia’s first successful liver transplant</td>
<td>Princess Alexandra Hospital, Brisbane, QLD, Australia</td>
</tr>
<tr>
<td>1985</td>
<td>First successful kidney transplant from a deceased donor</td>
<td>Queen Elizabeth Hospital, Adelaide, Australia</td>
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<tr>
<td>1986</td>
<td>First successful double lung transplant</td>
<td>Canada</td>
</tr>
<tr>
<td>1986</td>
<td>The ‘Brisbane Technique’ for splitting livers to benefit three recipients initiated</td>
<td>Princess Alexandra Hospital, QLD, Australia</td>
</tr>
<tr>
<td>1986</td>
<td>Australia’s first successful heart/lung transplant</td>
<td>St Vincent’s Hospital, NSW, Australia</td>
</tr>
<tr>
<td>1987</td>
<td>Australia’s first successful kidney/pancreas transplant</td>
<td>Westmead Hospital, NSW, Australia</td>
</tr>
<tr>
<td>1987</td>
<td>First segmental liver transplant (for children)</td>
<td>Princess Alexandria Hospital, QLD, Australia</td>
</tr>
<tr>
<td>1988</td>
<td>First successful intestinal transplant</td>
<td>UK</td>
</tr>
<tr>
<td>1988</td>
<td>First successful liver-bowel transplant</td>
<td>UK</td>
</tr>
<tr>
<td>1988</td>
<td>First two-in-one liver transplant (one liver is split for two recipients)</td>
<td>France</td>
</tr>
<tr>
<td>1989</td>
<td>First successful living liver transplant</td>
<td>Princess Alexandria Hospital, QLD, Australia</td>
</tr>
<tr>
<td>1989</td>
<td>First combination heart, liver, and kidney transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1990</td>
<td>First living related lung transplant</td>
<td>USA</td>
</tr>
<tr>
<td>1990</td>
<td>Australia’s first successful single lung transplant</td>
<td>St Vincent’s Hospital, NSW, Australia</td>
</tr>
<tr>
<td>1992</td>
<td>Xenotransplant (pig liver to human)</td>
<td>USA</td>
</tr>
<tr>
<td>1992</td>
<td>Xenotransplant (baboon’s liver to human)</td>
<td>USA</td>
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</table>

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<tr>
<th>Year</th>
<th>Event Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>World’s first laparoscopic live-donor nephrectomy in which a patient’s kidney is removed through a 5 to 6 cm incision</td>
<td>USA</td>
</tr>
<tr>
<td>1995</td>
<td>Transplantation of all abdominal organs</td>
<td>USA</td>
</tr>
<tr>
<td>1998</td>
<td>First successful human hand transplant (later removed)</td>
<td>France</td>
</tr>
<tr>
<td>2002</td>
<td>First single segment liver transplant on a baby (24 days old)</td>
<td>Princess Alexandra Hospital, QLD, Australia</td>
</tr>
<tr>
<td>2003</td>
<td>Australia’s first triple transplant (heart, lung, liver)</td>
<td>Princess Alexandra Hospital, QLD, Australia</td>
</tr>
<tr>
<td>2005</td>
<td>First successful partial face transplant</td>
<td>France</td>
</tr>
<tr>
<td>2005</td>
<td>First living donor islet transplant</td>
<td>Japan</td>
</tr>
<tr>
<td>2006</td>
<td>World’s first kidney/liver/pancreas transplant</td>
<td>Royal Price Alfred Hospital, NSW, Australia</td>
</tr>
<tr>
<td>2009</td>
<td>Paediatric transplant for small bowel, liver, pancreas and two kidneys</td>
<td>USA</td>
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**SOURCES INCLUDE:**

ORGAN DONATION: THE AUSTRALIAN ORGAN DONOR REGISTER

Important information on the donor register from the Department of Health and Ageing

What is the Australian Organ Donor Register?
The Australian Organ Donor Register enables people to record their decision about becoming an organ and tissue donor for transplantation after their death. The Australian Organ Donor Register is not for the purpose of recording decisions about donating organ and tissue for scientific research purposes or for the manufacture of biological medical products.

Who can register as a donor?
Only people aged 18 years and over can register their legally valid consent or objection on the Australian Organ Donor Register. If you are 16 or 17 years old you can still register your intention to donate by completing and returning the form available from Medicare Australia.

People aged less than 18 years can become organ and tissue donors, although consent will need to be obtained from a family member at the time of death.

Who can donate organs and tissue?
Anyone can donate organs and tissue – there is no age limit on the donation of some organs and tissue. While your age and medical history will be considered, you shouldn’t assume you are too young, too old or too unhealthy.

How do I record my consent on the Australian Organ Donor Register?
Registration is easy, voluntary and allows you to choose which organs and tissue you are willing to donate. To register, you can:
- Telephone 1800 777 203
- Request a registration form to be mailed to you by emailing your full name and postal address to aodr@medicareaustralia.gov.au
- Register online on the Medicare Australia website.

What if I’m already registered as a donor elsewhere?
It is important that you register your consent to be an organ and tissue donor on the Australian Organ Donor Register, which is the only national register for organ and tissue donation for transplantation. Even if you have previously expressed an intention to donate organs and tissue, for example, by ticking a box on a driver’s licence renewal or registering elsewhere, it is very important that you update your details and register your consent to be an organ or tissue donor on the Australian Organ Donor Register.

By recording your consent on the Australian Organ Donor Register, you can be confident that your consent will be recognised should the circumstances arise when you may become an organ or tissue donor.

Can I register a ‘no’?
If you do not want to become an organ or tissue donor, you can register your decision not to donate on the Australian Organ Donor Register by completing and returning the form available from Medicare Australia.

Should I discuss my decision about donation with my family, partner or friends?
It is important to discuss your decision with your family, partner or close friends. By registering your decision on the Australian Organ Donor Register, you will ease the burden on your family of having to make this decision on your behalf.

They will be an important part of the donation process so you need to make sure they are aware of your decision to register your consent on the Australian Organ Donor Register.

Your family member, partner or friend will be asked to confirm that you had not changed your mind since you registered your consent or your decision not to donate.

Where you have recorded your consent to donate organs and tissue, your family member, partner or friend will be asked questions regarding your medical history to determine which organs and tissue may be suitable for transplantation.

The more family members who know of your decision about organ and tissue donation, the easier they will find it to ensure your decision is respected and fulfilled.

How do I change my details recorded on the Australian Organ Donor Register?
You can alter your details recorded on the Australian Organ Donor Register, including your consent to donate, by calling 1800 777 203 to request a change of details form be sent to you, visiting www.medicareaustralia.gov.au to download a change of details form, or visiting any Medicare office and asking for a change of details form.

Who can get information about donors from the donor register?
Only authorised medical personnel (medical professionals associated with donation and transplantation activities) can get information from the donor register, subject to strict privacy controls.

Where can I get more information about the donor register?
www.medicareaustralia.gov.au

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WHO IS ON THE ORGAN TRANSPLANT WAITING LISTS?

There were 1,716 people on the official organ transplant waiting lists at 1 January 2009. A patient’s doctor will put an individual on a transplant waiting list based on medical and other criteria.

In 2008, 846 recipients received donated organs from 259 deceased donors. Three quarters of patients (76 per cent) on the organ transplant waiting lists are between 40 and 69 years of age. There are 164 people under the age of 30 years on the list, 29 per cent of whom are children or teenagers (under 18).

More than two thirds of people on the list need a kidney transplant. The average time waiting for a kidney transplant is more than three years.

HOW IS IT DECIDED WHO WILL GET A TRANSPLANT?

Allocation of organs is a complex process that depends on a range of factors including medical need, urgency and the capacity of the recipient to benefit. In Australia, allocation systems are underpinned by the principles of utility, equity and fairness.

Criteria that are used in considering potential organ transplant recipients include:

- Length of time waiting for a transplant
- Important medical factors such as tissue matching and matching of organ quality with the patient’s medical status
- The urgency of a transplant given the likely deterioration of health without transplant therapy
- Need in terms of how sick the patient is without transplant therapy
- Logistical factors involved in making a donated organ available to a recipient within an appropriate timeframe.

WHO MANAGES THE ORGAN TRANSPLANT WAITING LISTS?

Transplant waiting lists are managed by different groups according to both the organ involved and the state/territory that the recipient is in, guided by protocols developed by the Transplantation Society of Australia and New Zealand (TSANZ) and the Australasian Transplant Coordinators Association (ATCA).

The new Authority will lead the development and implementation of a national framework for organ and tissue allocation.

HOW DOES WAITING FOR AN ORGAN TRANSPLANT DIFFER FROM A TISSUE TRANSPLANT?

There are no formal waiting lists for tissues and hence it is not possible to determine the true extent of demand. Many more people are able to donate tissue for transplant. Following processing, tissues such as heart valves, skin and musculoskeletal tissue can be stored in defined conditions for up to five years before being used for transplantation.

Nevertheless, shortage of some kinds of tissue can occur, especially in the case of skin.

HOW LONG ON AVERAGE ARE PEOPLE ON THE ORGAN TRANSPLANT WAITING LIST?

Waiting list times vary. The reason for delays may be based on finding an appropriate donor, on urgency or on medical matching.

HOW MANY PEOPLE ON THE ORGAN TRANSPLANT WAITING LIST CAN A DONOR HELP?

The organs that can be donated for transplant in Australia include the heart, lungs, liver, kidneys and pancreas.

Tissue can also be donated, from heart valves to bone, skin, eye and pancreatic tissue.

Many lives can be saved or significantly improved from each donor.
The Australian and New Zealand Organ Donation Registry (ANZOD) and the Australian Organ and Tissue Donation and Transplantation Authority have released the latest organ donation figures which show that donation rates have exceeded the total number of donations in any year in Australia’s recorded donation and transplant history.

With 2010 being the Organ and Tissue Authority’s first full year of operation, this is a significant result,” Organ and Tissue Authority National Medical Director, Dr Gerry O’Callaghan said. “It shows that the Australian Government reform program is delivering significant outcomes.”

Chair of ANZOD, Professor Graeme Russ, said the generosity of 309 donors and their families has saved or significantly improved the lives of 931 Australians in 2010.

“This represents a 56 per cent increase – an additional 111 donors – if compared to the 198 deceased organ donors in 2007,” Professor Russ said.

“Most states and territories recorded increases in their rate of organ donations. Tasmania had the highest outcome (19.7 donors per million), followed by South Australia (18.8 per million), Victoria (17.7 per million), Australian Capital Territory (17.3 per million), New South Wales (12.4 per million), Queensland (10.8 per million), Western Australia (9.6 per million) and Northern Territory (8.7 per million).

By increasing on this number of donations by just 10 per cent we can help nearly 100 more Australians who are waiting on transplant waiting lists awaiting life saving or life improving transplants.

“There is much more to be done however these results are a credit to all involved,”

Note: ACT population includes residents of NSW Southern Area Health Service (excluded from the NSW population). This is consistent with historical Australia and New Zealand Organ Donor Registry reporting. On an actual population basis ACT donor per million population for 2010 would be 27.9 and NSW would be 12.0 donor per million population.


To discover more about organ and tissue donation, what to do when you decide to become a potential donor and suggestions on how to discuss your wishes with your family visit: www.donatelife.gov.au

2010 Organ donation figures show record high
Media release, 18 January 2011 © Commonwealth of Australia as represented by the Australian Organ and Tissue Donation and Transplantation Authority, 2010. Apart from uses permitted under the Copyright Act 1968 (Cth), all other rights are reserved. DonateLife | www.donatelife.gov.au
Myths and misconceptions about donation

Rumours, myths and misunderstandings about organ donation and transplantation are widespread and contribute to ongoing donor shortages. Transplant Australia explains the reality

MYTHS ABOUT DONATION

One of the reasons for the donor shortage in this country is the many myths and misconceptions clouding the topic, particularly among those who have not personally encountered transplant recipients or family members of donors. Rumours, myths and misunderstandings about organ donation and transplantation are widespread. Since organ transplantation cannot succeed without the majority participation and support of the community, these urban legends are dangerous. They have prevented full support for donation and led to the death of people who might otherwise be currently leading productive and happy lives.

ADVICE ON HOW TO DEAL WITH MYTHS

If you hear a myth or receive a myth on your email about organ donation or transplantation, do not pass it on! You should try to verify the story with the originator, or try to check it with the authorities. You will probably find it’s not true.

Here are examples of common myths about organ donation/transplantation:

MYTH NO. 1

“If I agree to donate my organs, my doctor or the emergency room staff won’t work as hard to save my life. They’ll remove my organs as soon as possible.”

REALITY

When you go to the hospital for treatment, doctors focus on saving your life – not somebody else’s. You’ll be seen by a doctor whose specialty most closely matches your particular emergency. The doctor in charge of your care has nothing to do with transplantation.

MYTH NO. 2

“Organ donation is against my religion.”

REALITY

Organ donation is consistent with the beliefs of most religions. This includes Catholicism, Protestantism, Islam and most branches of Judaism. If you’re unsure of, or uncomfortable with, your faith’s position on donation, ask a member of your clergy.

MYTH NO. 3

“I’m under age 18. I’m too young to make this decision.”

REALITY

You are not too young to make this decision, but until you are 18, you cannot register your legal consent, you can only register your intent as a 16-17 year old. Have this discussion with your parents.

MYTH NO. 4

“I want my loved one to have an open-casket funeral. That can’t happen if his or her organs or tissues have been donated.”

REALITY

Organ and tissue donation doesn’t interfere with having an open-casket funeral. The donor’s body is clothed for burial, so there are no visible signs of organ or tissue donation. For eye donation, an artificial eye is inserted, the lids are closed, and no one can tell the difference. For bone donation, artificial bone is inserted where bone is removed. With skin donation, a very thin layer of skin similar to a sunburn peel is taken from the donor’s back. Because the donor is clothed and lying on his or her back in the casket, no one can see a difference.
**MYTH NO. 5**

“I’m too old to donate.”

**REALITY**

There's no defined cut-off age for donating organs. Organs have been successfully transplanted from donors in their 70s and 80s. The decision to use your organs is based on strict medical criteria, not age. Don't disqualify yourself prematurely. Let the doctors decide at your time of death whether your organs and tissues are suitable for transplantation.

**MYTH NO. 6**

“I’m not in the greatest health, and my eyesight is poor. Nobody would want my organs or tissues.”

**REALITY**

Very few medical conditions automatically disqualify you from donating organs. The decision to use an organ is based on strict medical criteria. It may turn out that certain organs are not suitable for transplantation, but other organs and tissues may be fine. Don't disqualify yourself prematurely. Only medical professionals at the time of your death can determine whether your organs are suitable.

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**MYTH NO. 7**

“Rich, famous and powerful people always seem to move to the front of the line when they need a donor organ. There's no way to ensure that my organs will go to those who've waited the longest or are the neediest.”

**REALITY**

The rich and famous aren't given priority when it comes to allocating organs. It may seem that way because of the amount of publicity generated when celebrities receive a transplant, but they are treated no differently to anyone else.

**MYTH NO. 8**

“My family will be charged if I donate my organs.”

**REALITY**

There is no charge to the donor or the donor’s family for any part of organ or tissue donation.

**MYTH NO. 9**

“I heard about this guy who went to a party, and woke up the next morning in a bathtub full of ice. His kidneys were stolen for sale on the black market!”

**REALITY**

There is no documented case of this ever happening. In Australia and the developed world, it is illegal to buy and sell organs. The process of matching donors with recipients, the need for highly skilled medical professionals to perform the surgery, and the need for modern medical facilities and support necessary for transplantation make it highly unlikely that this system could be duplicated in secrecy.

**MYTH NO. 10**

“If I’m in an accident and the hospital knows I want to be a donor, the doctors won't try to save my life!”

**REALITY**

The medical team treating you is completely separate from the transplant team. Transplant teams are only notified of the possibility of donation after a person has been declared legally dead and the family have agreed to donation.

**MYTH NO. 11**

“If I donate, I would worry that the recipient and/or the recipient’s family would discover my identity and cause more grief for my family.”

**REALITY**

Health professionals who are involved in organ and tissue donation and transplantation are bound by the law forbidding the disclosure of identifying information. They cannot and do not facilitate donor families and recipients meeting. All correspondence between donor families and recipients is sent to the relevant Donor or Recipient Coordinators where it is screened for identifying information and then mailed on. This ensures no contact details between donor families and the recipients are disclosed to either party. There have been occasions where donor families and recipients have found each other and met. These meetings have been organised by the individuals involved. The health professionals involved in their cases did not facilitate the disclosure of information and the subsequent meeting.

**MYTH NO. 12**

“I heard that they take everything, even if I only want to donate my eyes.”

**REALITY**

You may specify which organs you want donated. Your wishes will be followed.

**MYTH NO. 13**

“People can recover from brain death.”

**REALITY**

People can recover from comas, but not brain death. Coma and brain death are not the same. No one has ever
recovered after the diagnosis of brain death using the documented neurological criteria.

**MYTH NO. 14**

“Minorities should refuse to donate because organ distribution discriminates by race.”

**REALITY**

Organs are matched by factors, including blood group and tissue typing, which can vary by race, but this does not preclude them from receiving transplants.

The Australian Organ Donor Register is the only national register for organ and tissue donation for transplantation after death.

**MYTH NO. 15**

“I have registered on my driver’s licence to be an organ donor.”

**REALITY**

It is important that you register your consent to be an organ and tissue donor on the Australian Organ Donor Register – it is the only national register for organ and tissue donation for transplantation after death. Even if you have previously expressed an intention to donate organs or tissue, for example by ticking a box on a driver’s license renewal or registering elsewhere, it is very important that you update your details and register your consent to be a donor on the Australian Organ Donor Register. Then, you can be confident that your consent will be recognised should the circumstances arise when you may be able to donate organs or tissues.

**MYTH NO. 16**

“Organ recipients acquire their donor’s characteristics.”

**REALITY**

It has never been scientifically proven that transplant recipients acquire their donor’s characteristics. Although some transplant recipients believe they have acquired their donor’s characteristics, this phenomenon has never been proven. Transplanted organs do not have a ‘memory’ so there may be other explanations for why recipients gain interest in activities in which they previously had no interest. Some believe the power of suggestion or the experience of the illness and transplant might have an effect on the recipient.

**MYTH NO. 17**

“I don’t need to tell my family that I want to be a donor because I have it written in my will.”

**REALITY**

By the time your will is read, it will be too late to recover your organs. Telling your family now that you want to be an organ and tissue donor and registering as a donor are the best ways to ensure your wishes are carried out.

**MYTH NO. 18**

“I am an organ recipient, can I be a donor?”

**REALITY**

This depends on the circumstance of the patient’s cause of death and whether the death is related to the recipient organ. Under these circumstances, an organ recipient may be a donor of any eligible organs, including a healthy recipient organ. Organ recipients cannot be tissue donors due to the immunosuppressive drugs that are taken after the transplant and their harm caused to the body.
Over the last ten years, organ donation rates in Australia have fluctuated around 200 donors per year. Australia is internationally recognised for a strong record of successful organ transplantations, but also has one of the world’s lowest rates of organ donations with the consequence that substantial numbers of people die while waiting for suitable donated organs to become available.

**FREQUENTLY ASKED QUESTIONS**

**Why should I consider donating organs and tissue?**

For people with serious or life-threatening illnesses, organ or tissue transplantation may mean a second chance at life. More than 30,000 Australians have received transplants in the last 60 years. Improved survival rates now mean that most recipients of organs or tissue can look forward to a better quality of life.

**Who can donate organs and tissue?**

Anyone can choose to donate organs and tissue – there is no age limit on the donation of some organs and tissue. While your age and medical history will be considered, you shouldn’t assume you are too old or not healthy enough.

**What organs and/or tissue can be donated?**

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<td>Organs</td>
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<td>Tissues</td>
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**When can organ and tissue donation occur?**

Most organ and tissue donation occurs after death. Kidneys; livers; stem cells sourced through bone marrow, cord blood and peripheral blood stem cells; skin donation; some bone tissue can be donated while you are living. In most cases, organ and tissue donation occurs after brain death. Brain death occurs when the brain stops functioning with no possibility of recovery.

Organ donation is only considered after several tests are carried out by two appropriately qualified senior doctors to establish whether brain death has occurred.

**Anyone can choose to donate organs and tissue – there is no age limit on the donation of some organs and tissue.**

The way in which a person dies will generally determine what they are able to donate. In most cases, organs (heart, lungs, liver, pancreas and kidneys) can only be donated if a person has died in an intensive care unit under special circumstances. Less than 1 per cent of all people who die in hospital each year die this way.

In some cases organ donation may be possible after a person’s heart has stopped beating, but this is rare.

People are sometimes concerned or confused about the difference between brain death and coma. Brain death and coma are very different.

A patient in a coma is unconscious because their brain is injured in some way, although their brain continues to function and may heal. Medical tests on a patient can clearly show the difference between brain death and coma.

A greater number of people have the opportunity to donate tissue for transplantation, such as eye tissue, heart valves, bone tissue and skin tissue. This is because tissue donation does not require the same special circumstances as organs usually do for transplantation to be successful.

**How are organs and tissue removed?**

The removal of organs and tissue is no different to any other surgical operation and is performed by highly skilled health professionals. The donor’s body is always treated with dignity and respect. The donation of organs and tissue does not alter the physical appearance of the body.

**What screening processes occur before organs are donated?**

Before organ donation proceeds, potential organ donors are rigorously screened on a case by case basis by transplant clinicians to ensure that risks of infection, disease, complications or donated organs being in a
sub-optimal state are minimised or eliminated.

Where consent to organ donation is established, the donation process commences with the completion by a potential donor’s family of a comprehensive donor referral questionnaire, which covers the potential donor’s medical and other history, and assists nursing and medical staff collate information required to refer the patient on for organ donation. Following the completion of the donor referral questionnaire by a potential donor’s family, and consequent identification and minimisation or elimination of risk factors, a range of detailed clinical screening processes follow, consistent with State or Territory clinical guidelines, including physical examination, tissue and blood typing, virology, haematology and other testing.

State and Territory clinical guidelines vary somewhat, with some applying absolute exclusions for donation in relation to certain illnesses and conditions, but nevertheless, all provide a detailed, safe and rigorous organ donation screening process consistent with relevant State and Territory legislation.

What quality and safety procedures apply to organ donation?

The comprehensive and rigorous processes that address organ donation quality and safety in Australia are guided and developed in the context of contemporary developments in disease management and advances in clinical practice by Australian Government organisations including the National Health and Medical Research Council and the Therapeutic Goods Administration, as well as State and Territory Governments, and peak bodies such as the Australian and New Zealand Intensive Care Society, and the Transplantation Society of Australia and New Zealand.

For people with serious or life-threatening illnesses, organ or tissue transplantation may mean a second chance at life. More than 30,000 Australians have received transplants in the last 60 years.

If I become an organ donor, will my organs and/or tissue be used for research purposes?

Separate and specific permission is required for donated organs and tissue to be used for research purposes. Donated tissue and organs will not be used for medical research unless explicit written permission is granted by the family or next of kin.

State and Territory legislation permits choices and individual decisions about donation of organs and tissue for medical and scientific purposes. However, local hospitals, research institutions and cross-border protocols may impact on the outcome of organ and tissue donation.

Why should I discuss donation with my family?

Should the situation arise where donation is a possibility, your family may be asked about your decision to be an organ and/or tissue donor. Anecdotal evidence has shown that families are more likely to say yes to donation if they are aware of their loved ones’ wishes to donate. The more family members who know of your decision to donate (or not donate) organs or tissue for transplantation, the more likely it is that your wishes will be upheld.
**ORGAN DONATION IS AGAINST MY RELIGION**

*Reality:*

Most religions support organ and tissue donation as generous acts that benefit people. This includes Christianity, Islam, Buddhism, Hinduism and Judaism. If you are not sure whether your religion is supportive, speak to your religious adviser.

You can also read or download a fact sheet on organ and tissue donation in relation to all the major religions at [www.donatelife.gov.au](http://www.donatelife.gov.au).

**I’M TOO OLD, TOO YOUNG OR NOT HEALTHY ENOUGH TO DONATE**

*Reality:*

Almost anyone can donate their organs and tissue. While your age and medical history will be considered, you shouldn’t assume you are too old, too young or not healthy enough. There’s every chance that some of your organs and tissues will be suitable for donation. Only some medical conditions may prevent you from being a donor, such as transmissible diseases like HIV.

**MY FAMILY WON’T BE ABLE TO VIEW MY BODY**

*Reality:*

Yes they will. The removal of organs and tissue is no different from any other surgical operation, and is performed by highly skilled health professionals. The donor’s body is always treated with dignity and respect. The donation of organs and tissue does not alter the physical appearance of the body, and your family will be able to view your body and have an open casket if they wish.

Only some medical conditions may prevent you from being a donor, such as transmissible diseases like HIV.

**I’VE ALREADY REGISTERED. I DON’T NEED TO TELL MY FAMILY**

*Reality:*

You do need to discuss your decision with your family and friends, even if you have registered on the Australian Organ Donor Register (or, in some states, on your driver’s licence). Donation won’t proceed without your family’s consent. Families are less likely to give consent for donation if they do not know the wishes of the deceased. That’s why every family is encouraged to discuss and know each other’s wishes.

**I’M NOT SURE IF I AM REGISTERED**

*Reality:*

You can check and update (or register) your details on the Australian Organ Donor Register at [www.medicare.gov.au](http://www.medicare.gov.au), call 1800 777 203 or visit any Medicare office.

In Australia you can donate your organs – heart, lungs, liver, kidneys and pancreas – and tissues – heart valves and pericardium, corneal and eye tissue, bone and related musculoskeletal tissue and skin tissue. You record which organs and tissue you want to donate on the Australian Organ Donor Register.

**THERE WON’T BE ANY SUPPORT FOR MY FAMILY**

*Reality:*

The Intensive Care Unit team caring for you and the DonateLife Donor Coordinator and Donor Family Support Coordinator give the family as much support as they need during and after the decision to donate.

Families considering organ and tissue donation will also have access to free bereavement counselling.

The DonateLife Donor Coordinator will be the family’s initial point of contact from the time donation is first discussed. They provide the link between the family and the medical team and will help the family after the donation,
particularly with arranging a private farewell and/or a viewing of the body, if the family wishes.

The coordinator will contact the donor family with details of support offered in their state or territory. The coordinator can, if the family wishes, provide information on the outcomes of the donation and give details on how to write anonymously to the recipients.

**MY ORGANS AND TISSUE WILL BE USED FOR RESEARCH**

**Reality:**

Organ donation is about helping save or improve other people's lives. Donated tissues and organs will never be used for medical research unless explicit written permission is given by your family.

**DOCTORS WON’T WORK AS HARD TO SAVE MY LIFE IF THEY KNOW I’M A DONOR**

**Reality:**

Not so. Medical staff do everything possible to save lives. Their first duty is to you and saving your life. Organ and tissue donation will only be considered after all efforts fail and you have been legally declared dead.

In most cases, a person may only be able to donate organs where they have been declared brain dead in an intensive care unit in hospital. Brain death is when blood circulation to the brain ceases, and the brain stops functioning and dies with no possibility of recovery. A series of tests carried out by two independent and appropriately qualified senior doctors establishes that brain death has occurred.

**People are sometimes confused about the difference between brain death and coma.**

Brain death is completely different from coma. People are sometimes confused about the difference between brain death and coma. Brain death is completely different from coma. A patient in a coma is unconscious because their brain is injured in some way, but their brain can continue to function and may heal. Medical tests can clearly distinguish between brain death and coma.

Organ donation may also be possible after a person’s heart has stopped beating, referred to as cardiac death.

A far greater number of people have the opportunity to donate tissue for transplantation. Tissue donation does not require the donor’s death to have occurred in the same limited circumstances as organ donation for transplantation to be successful.

**I DON’T NEED TO DONATE BECAUSE THOUSANDS OF OTHERS DO**

**Reality:**

Few people die in such a way that donation is possible. Organ donors must die in hospital where their body can be medically supported until the organs can be donated.

There are some 1,700 Australians on official waiting lists at any one time.

**PEOPLE ONLY NEED ORGANS BECAUSE OF BAD LIFESTYLE CHOICES**

**Reality:**

Many people have an inherited genetic condition, a severe illness or disease that will kill them, often at a young age. Common genetic conditions are cardiomyopathy (which affects the heart), cystic fibrosis (the lungs) and biliary atresia (the liver). Corneal transplants restore sight to people following a disease or damage to their eyes. Heart valves are used to repair congenital defects in young children and replace defective valves due to disease such as rheumatic fever, degeneration and infection.

**DISCOVER** the facts about organ and tissue donation  
**DECIDE** about becoming a donor  
**DISCUSS** your decision with the people close to you.

**To donate life, know their wishes.**

**Ask them today.**

OK.
WOULD MY DONATION BE MANAGED WITH CARE?

It can be hard to decide about organ and tissue donation if you don’t know what would happen and how your family would be cared for during the process. This chapter explains the systems in place to make sure that all those involved in organ and tissue donation are cared for and supported.

Ethical principles

Organ and tissue donation in Australia is based on the following ethical principles.

- Organs and tissues are only removed once the person is dead.
- Donation is intended to benefit others. No reward or even acknowledgement by those who benefit is expected.
- A person’s wishes about donation are respected.
- Families are given time to consider and discuss their views.
- If a close family member objects, donation will not go ahead.
- Families are supported and cared for throughout the donation process. Counselling may be provided at the time of donation or later if the family wishes.
- The person donating is always treated with respect and dignity.
- Organs and tissues are allocated fairly, following specific processes for each type of organ or tissue as well as criteria for matching the donation to the recipient.

Health professionals work within a code of ethics and follow professional guidelines. This means that there are standards directing what they do and how they do it. Health professionals assisting patients who may be suitable donors and their families have relevant experience and training. Whatever the situation – whether in a small country hospital or a large city hospital – the family will be supplied with all the information that they need. They will also have access to counselling and other types of support. At each hospital there is also a ‘designated officer’ – someone who makes sure that organ and tissue donation is managed properly.

The designated officer makes sure that:

- Accepted medical criteria have been used to confirm death.
- The Australian Organ Donor Register has been consulted to find out whether a person has agreed or objected to donation.
- The necessary consent has been given by the person’s next of kin.
- The process is carried out following standards for hospital practice and the law.
- The family has been cared for and supported.

BEFORE YOU DECIDE

Here are some questions you might like to consider.

- Do I think that donating organs and tissues for transplantation is worthwhile?
- How would I feel if a relative or friend needed an organ?
- What do my family and friends think about organ and tissue donation?
- Am I satisfied I understand the concept of brain death as a way of determining death?
- How do I feel about my body once I am dead?
- How does organ and tissue donation and transplantation fit with my religious, spiritual and moral beliefs?
- Do I feel that once I’m dead, I don’t need my body anymore and it should be used to help others?
- Do I feel that even when I’m dead my body is still me and should remain intact for cremation or burial?
- Do my family and friends know what I want to happen with my body after I die?

Why people may choose to register an objection to donation

- Organ and tissue donation is too invasive.
- I feel that it is wrong to take organs and tissues from a dead body.
- I don’t accept that brain death is equivalent to death.
- It will upset my family too much to think about it when I’ve just died.
- I’m not sure how my religious faith views donation.
- Organ and tissue donation is not consistent with my beliefs about the body after death.

Why people may choose to register consent to donation

- After my death, I’d like to do something to help others in medical need.
- Once I’m dead, I don’t need my organs and tissues any more so someone else might as well have them.
- It may comfort my family to know that some good has come from my death.
- Waiting lists are long and there is a real need for more organ donors.
- Transplantation is generally successful and can improve the quality or length of life.
- I feel okay about organ and tissue donation because it is allowed by my religious faith.
- Being offered the opportunity to consider organ and tissue donation after my death may give some comfort to my family.

Views that may influence consent or objection to donation

- Do I feel that once I’m dead, I don’t need my body anymore and it should be used to help others?
- Do I feel that even when I’m dead my body is still me and should remain intact for cremation or burial?
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WHEN MAY I DECIDE?

Organ and Tissue Donation after Death

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- Do my family and friends know what I want to happen with my body after I die?

Why people may choose to register an objection to donation

- Organ and tissue donation is too invasive.
- I feel that it is wrong to take organs and tissues from a dead body.
- I don’t accept that brain death is equivalent to death.
- It will upset my family too much to think about it when I’ve just died.
- I’m not sure how my religious faith views donation.
- Organ and tissue donation is not consistent with my beliefs about the body after death.

Views that may influence consent or objection to donation

- Do I feel that once I’m dead, I don’t need my body anymore and it should be used to help others?
- Do I feel that even when I’m dead my body is still me and should remain intact for cremation or burial?
- Do my family and friends know what I want to happen with my body after I die?

WHEN MAY I DECIDE?

Organ and Tissue Donation after Death

- Do I feel that once I’m dead, I don’t need my body anymore and it should be used to help others?
- Do I feel that even when I’m dead my body is still me and should remain intact for cremation or burial?
- Do my family and friends know what I want to happen with my body after I die?

BEFORE YOU DECIDE

Here are some questions you might like to consider.

- Do I think that donating organs and tissues for transplantation is worthwhile?
- How would I feel if a relative or friend needed an organ?
- What do my family and friends think about organ and tissue donation?
- Am I satisfied I understand the concept of brain death as a way of determining death?
- How do I feel about my body once I am dead?
- How does organ and tissue donation and transplantation fit with my religious, spiritual and moral beliefs?
- Do I feel that once I’m dead, I don’t need my body anymore and it should be used to help others?
- Do I feel that even when I’m dead my body is still me and should remain intact for cremation or burial?
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- Organ and tissue donation is not consistent with my beliefs about the body after death.
Decided about becoming an organ and tissue donor?

Everyone has their own reasons for deciding whether to become an organ and tissue donor. It is important that the people close to you understand those reasons. Your family need to know your decision because they will be asked to give consent.

Families that know each other’s donation decisions are more likely to uphold them. Families that do not know the wishes of the deceased are much less likely to agree to donation.

You may think you are too old or unhealthy to be a donor. Or that your religion doesn’t support organ and tissue donation. These are common myths and misconceptions.

Discover the facts about organ and tissue donation. This will help you make an informed decision about whether to become an organ and tissue donor. You can register your decision online at the Australian Organ Donor Register (www.medicareaustralia.gov.au), call 1800 777 203 or complete a form at any Medicare branch.

You still need to discuss your decision with your family.

When is a good time to start a family discussion?

Today. You can use every day situations to start a discussion on important life issues, including what to do with your organs and tissues when you die.

This might include:
➤ The next time your family sits down together for a meal
➤ Making a will or advanced health directive
➤ Getting life insurance or income protection
➤ Leaving home for the first time as a young adult
➤ Getting or renewing your driver’s licence
➤ Celebrating an anniversary with your partner
➤ Having a significant birthday: 21, 30, 40, 50 or more
➤ Getting a check-up at the GP
➤ Hearing about someone who has been a donor, needs a transplant or has had a transplant
➤ Watching donation and transplantation stories on TV or seeing a media article
➤ Seeing or hearing an ad on TV, radio or billboards
➤ Seeing a traumatic event in the news
➤ After a friend or family member dies
➤ When children discuss the topic at school.

If you have already had a discussion with your family about your wishes, these events provide a good opportunity to repeat your decision to ensure they are remembered.

Why does my family need to know my decision?

As part of the national reform package for organ and tissue donation, the family of every potential donor will be asked to give their consent to donation if the situation arises. The request will be made by trained health professionals.

Even if you have registered your wish to be a donor, your family will still be asked to give consent.

The most important thing people want to know in order to make a decision about a family member becoming a donor is the wishes of the deceased.

Many Australians have not informed their family of
their donation decision. Many family members do not confidently know each other’s donation decision. Many people have not discussed their donation decision with family members in the past 12 months. Many cannot remember.

**Your family need to know your decision because they will be asked to give consent. Families that know each other’s donation decisions are more likely to uphold them.**

**It's not my family's business**
Yes it is. Your family will be asked to give consent for you to become a donor when you die.

**I'll think about it later**
Most people who become donors die suddenly and unexpectedly.

**I don't have time. I'm too busy**
It does not take long to register your decision on the Australian Organ Donor Register and to have a discussion with your family.

**My family won't understand**
Organ and tissue donation is a sensitive subject. The decision to become a donor is a personal and important one. To make the right decision for yourself, you need to have the facts so that your decision is informed. Your family might also need time to discover the facts and make their own decisions.

You can download your Discussion Kit on organ and tissue donation at www.donatelife.gov.au.

This resource aims to assist your family to have an informed, memorable discussion about each other’s donation decisions.

**Did you know ...?**
- Australia has a world-class reputation for successful transplant outcomes

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**TRANSPLANTED ORGANS IN AUSTRALIA (2010)**

<table>
<thead>
<tr>
<th>Organ Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney</td>
<td>548</td>
</tr>
<tr>
<td>Liver</td>
<td>204</td>
</tr>
<tr>
<td>Heart</td>
<td>65</td>
</tr>
<tr>
<td>Heart/lung</td>
<td>3</td>
</tr>
<tr>
<td>Intestine</td>
<td>1</td>
</tr>
<tr>
<td>Lung</td>
<td>120</td>
</tr>
<tr>
<td>Pancreas/kidney</td>
<td>34</td>
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<tr>
<td>Pancreas islets</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>984</strong></td>
</tr>
</tbody>
</table>

*Source: Australia and New Zealand Organ Registry (ANZOD) in conjunction with ANZDATA Registry*
I’m writing this in the renal unit of the Prince of Wales Hospital in Sydney’s south. I’m typing with my right hand because I am not allowed to use my left. The reason? I’m on dialysis. By ABC Radio presenter Mark Colvin

In 1994, in Rwanda, I contracted an illness which was transitory and minor in itself, but which triggered an auto-immune system disease which nearly killed me. In the process it damaged my kidneys – and although they recovered in the short term, the damage was done. Over 16 years, my renal function has gone from bad to worse.

Last Monday, my doctor told me my kidney function was down to 5 per cent. At that level, my body is no longer protecting me. Levels of potassium – normally regulated by the kidney – build up to a point where the body no longer controls the heart rate. A heart attack or stroke is likely.

Urea – a substance produced by the liver in digesting food – is no longer excreted by the kidneys, but remains in the body. It’s a poison. Dialysis is a way of dealing with this problem. Two months ago, I had an operation to take a large vein out of my thigh and put it in my left forearm. A good strong vein – called a fistula – is needed for regular dialysis. Now I’m finding out why.

I sit in a big comfortable chair, not unlike a business class airline seat. A nurse injects the fistula in two places with local anaesthetic. A minute or two later, she inserts two needles – and they’re big ones, much bigger than the ones I’m used to for taking blood or having injections – into the fistula.

The needles are attached to tubes, which lead in and out of a machine. My arterial blood pumps steadily out into this machine, which ‘washes’ it – cleansing it of the potassium and urea – and back into the vein. This goes on for five hours. Then I go to work.

How has it affected me? It’s boring, but I can still read, and use a laptop to do my research for that evening’s PM. I can listen to music, or watch a DVD if I want.

Apart from the initial needles, it’s not painful, and the nurses and doctors are charming, extremely efficient and understanding. But it means I can no longer really travel – I’m chained to this routine, three days a week, indefinitely. And of course, it consumes 15 hours of my time, week in, week out.

There is an alternative to all this: a kidney transplant; but it’s a distant alternative. The average wait for a kidney in this country is four years, but waits of seven years are not uncommon.

There are more than 10,000 people in Australia who are on dialysis. The majority would benefit from a transplant. On average one Australian dies each week while waiting for a transplant. In reality, only 6.5 per cent of people on dialysis get a transplant each year. Nearly half of those receive a kidney from a live donor – usually a blood relative or a spouse.

... we still lag behind the world, and there’s a long way to go. Where there has been progress, it’s been patchy and it varies from state to state.

But that’s a hard choice to make, even though it’s a highly effective operation, and it’s possible to live a perfectly healthy life with one good kidney. Not many people voluntarily go under the surgeon’s knife, and some of those who would like to donate a kidney to a loved one find that they can’t, because of a tissue mismatch or some pre-existing problem with their own health.

So the majority of transplants have to come from the recently dead; and therein lies a problem. Many people whose organs might be suitable die without having ticked the donor box on their driving licence, or having discussed the donation question with their families.

And even when a person has ticked the donor box, the situation in the hospital where they’ve died is often so fraught that surviving family members, for various reasons, withhold permission. The result: Australia last year had a deceased organ donation rate of 11 people per million. That puts this country low on the organ donation league table, behind, for instance, Sweden with 15, Germany with 16, and Austria with 21.

But none of them even come close to a country like Spain, now regarded as the world leader in organ donation, with 34. How have the Spanish done it? The answer is not simple, although the first step may be. In Spain, there is an ‘opt out’ system, as opposed to our ‘opt in’ system. In other words, you tick a box on your driver’s licence form only if you don’t want to donate your organs after death, not if you do.

But opt out is not the only answer. Sweden, for instance, has an opt out system, but its figures are still, as I mentioned, relatively low. As I understand it, a key to Spain’s success is to have put into hospitals a network of specialists in the difficult business of liaising between grieving families and transplant surgeons.

That seems to have been one of the keys to the way Spain has lifted its numbers. It obviously means spending some money, but it would save some too: hospital haemodialysis costs $82,704 per patient per year.

Australia has made some changes in recent times with a view to improving the donation rate, but we still lag behind the world, and there’s a long way to go. Where there has been progress, it’s been patchy and it varies from state to state.

I can honestly say that I have always ticked the donation box on my driver’s licence – this is not a deathbed conversion. But I am now aware, more personally than ever before, of the need for change and progress in this area.

And I would urge you, if you’ve read this far, to think seriously about your own organ donation choices, and to discuss them with your family.

Mark Colvin is the presenter of ABC Radio’s current affairs program PM.
Organ and Tissue Donation Issues in Society | Volume 333

Organ and Tissue Donation

Organ transplantation saves lives and improves the quality of life for many people. A transplant involves taking organs from a person who is dead and putting those organs in a person to help them live.

The sudden death of a previously healthy family member is a traumatic experience that will affect people in many different ways. It may be the first time a person has heard about brain death, an injury to the brain that causes the brain to swell and stops blood (and vital oxygen) flowing to the brain. The swelling also causes the brain to push on the brain stem. The brain stem controls our breathing, blood pressure, heart rate and body temperature. All of these are vital to maintain life.

When a dead relative is on a ventilator (a machine that pumps air into the lungs) in a hospital Intensive Care Unit, it is difficult to understand that a person can be dead when they have a beating heart, are warm to touch, and their chest is moving up and down. However a person who is brain dead looks just like this, so even though you are told your relative is dead, it may take some time for you to fully understand. Diagrams, looking at x-rays (if they were taken) and asking questions will help you to understand that brain death is death.

The request for organ donation may come as a shock for many relatives. It is important to realise that most organs can only be donated from people who are brain dead. The request for organ donation needs to occur after your relative is certified dead, the time of the last brain death test.

It is unfortunate that many families have never discussed or even thought about organ donation until a tragedy happens. Families will be asked about the wishes of their dead relative. If these wishes are not known, the family will need to make the decision.

When surveyed, donor families gave the following reasons for consenting to organ donation:
➤ It was an opportunity for something positive to come out of tragedy
➤ To enable someone else to live a better life
➤ She or he would have wanted to help others.

Support for donor families will help in their grief recovery. This support starts at their arrival at the hospital and includes:
➤ Accurate information regarding the patient’s treatment and likely outcome
➤ Empathy and understanding from all staff
➤ Information about organ donation
➤ The chance to ask questions
➤ Private times with their relative and a time to say ‘goodbye’
➤ Consideration of spiritual needs.

It is policy for families to receive information regarding who has been helped by this generous gift.

There are situations that may complicate the grieving of family members. These include:
➤ Sudden death
➤ The death of a child
➤ Perception that death may have been prevented
➤ Lack of support
➤ Lack of opportunity to spend time with their relative.

Sadly many donor families have such experiences and these families may need special attention and support.

Organ donation agencies are able to offer support after an organ donation. Talking to other donor families can be helpful. Families are urged to contact their Organ Donation Agency for assistance in finding answers to questions. Most agencies can make referrals to suitable bereavement counsellors if required.

Organ donation does not take away the pain of death. However, many donor families have said that the transplant was the only positive thing to come from the death of their relative.

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Gordon Brown has initiated a debate in the UK about how to increase that country’s dismally low organ donation rate. Brown has suggested that a “presumed consent” system be established under which organ donation after death would be assumed, unless individuals had opted out or their families opposed donation. The proposal has drawn strong objections from ‘patients’ groups’ (yes, apparently there are such things as patients’ groups in the UK), who say organ donation is “a matter of individual conscience”.

Australia would do well to pay attention to this debate – we have one of the lowest organ donation rates in the world, and it has been static since the 1990s. Perhaps a lot of us thought Monty Python’s organ donation scene in *The Meaning of Life* was a documentary.

Even if someone has registered as an organ donor, families are permitted to abrogate this clearly-expressed intention after death ...
I refer to the article in *Crikey* on Friday about organ donation. I feel for Tim Richards and the other 1,900 people waiting for an organ transplant. And I agree it is a tragedy that a hundred people die each year waiting for a transplant.

But I disagree with his argument that many of those people wouldn’t still be waiting or dying if Australia adopted a system of presumed consent to organ donation – the so-called ‘opt-out’ system.

Mr Richards and other proponents of opt-out argue that Spain has a better donation rate than Australia. Spain has an ‘opt-out’ system. Therefore if Australia adopted an ‘opt-out’ system we would have the same rate as Spain.

Spain adopted the opt-out system of consent in 1979. But its organ donation rate did not begin to improve until 1989 when it adopted a system of putting organ donor coordinators into hospitals. Since then the donation rate per million population has increased from 14 to 35.

A recent Churchill Fellow who studied organ donation systems in the USA, the UK and Spain concluded that: “the increase in organ donation during the nineties cannot be attributed to any change of the Spanish legislation which has remained unmodified since 1979.”

It should also be noted that despite the legal presumption of consent for organ donation, the Spanish system does ultimately allow the families of the deceased to refuse donation.

The second most successful country in terms of organ donors per capita is the United States – which has the same system of consent as Australia.

The fact is that Australia has had outstanding success as a nation in reducing many of the factors that maintain the pool of potential organ donors. During the past two decades we have halved the road toll, we have made significant inroads into the death rate from strokes and, unlike the United States, we have very few gun-related deaths.

As the Spanish and United States experience shows, improving practices and procedures at the hospital level can generate substantial improvements in donation rates. The United States Organ Donor Breakthrough Collaborative, involving hospital-based teams pooling information, has increased the number of donors per month by 30 per cent over four years. A similar initiative in Australia introduced in some hospitals in mid-2006 and now extended to 22 hospitals is showing great promise.

We should not let talk of ‘opt-out’ options distract us from making the changes within the system identified by the National Clinical Taskforce. In developing its report it drew together a diverse and divided sector: it is now up to governments to take the recommendations and make them work.

And if we want to make a personal difference, we should register our consent to organ donation on the Australian Organ Donor Register at www.medicareaustralia.gov.au and discuss our decision with our family.

First published in *Crikey*, 17 March 2008

www.crikey.com.au
Organs available for transplantation from deceased donors in Australia are failing to meet the needs of the individuals on organ transplant waiting lists each year. An increase in supply of donated organs will benefit greater numbers of transplant recipients, however some solutions are intertwined with undesirable ethical costs.

It is plain to see that an increase in supply of donated organs will improve this disparity and benefit greater numbers of transplant recipients, however some solutions suggested recently in Australia and abroad are intertwined with undesirable ethical costs. Two solutions that have received attention recently include; implementation of an opt-out organ donation system and a change to the dead donor rule.

**OPT-OUT ORGAN DONATION SYSTEM**

Organ donation is widely promoted as a powerful expression of altruism and as a gift of life. Consent-given gifts or donations establish the basic principle behind how the system of organ donation operates. However, in an opt-out organ donation system this principle has been suspended. In an opt-out system the wishes of the majority are unknown yet organs are nevertheless removed. Instead, the system is one of presumed ownership of the deceased body by the impersonal state. This interference by the state in personal life is a considerable rights issue.

In practical terms, there are a range of matters that further complicate an opt-out system.

First, the evidence seems to be equivocal about whether such a change would really increase the number of organs available. Some countries with opt-out systems do worse than those with opt-in systems and some do better, suggesting that other factors may be more important.

Second, opt-out systems can come in soft and hard versions, depending upon whether the next of kin are consulted. It is debatable whether more or less harm can come to next of kin one way or the other. With a soft opt-out system, as in Spain, consulted grieving relatives are presented with a choice that many find very difficult. But with a hard opt-out system relatives can find their exclusion very painful.

In an opt-out system the wishes of the majority are unknown yet organs are nevertheless removed.

Third, an opt-out system requires a high level of public awareness to avoid circumstances in which people may object to organ donation but have never registered their desire to opt-out. It is sometimes argued that...
an opt-in system cannot produce high donation rates because many people who want to donate simply don’t get around to registering. But the same argument can apply in reverse to an opt-out system. In an opt-out system people who actually do not want to donate may never get around to registering. This would mean that people’s actual wishes would be overridden in an opt-out system.

Fourth, an opt-out system has the potential to further alienate those who already mistrust the authorities. Feedback from the public about the UK’s opt-out plans (now aborted) reveals significant numbers of people who currently are registered to donate, but who would deliberately opt-out in protest about state interference if a presumed consent system were introduced.

Fifth, it is possible that the implementation of an opt-out system may contribute to a slippery slope where consent is presumed in other medical contexts. For example, it could easily be argued that presumed consent should extend to the use in research of tissues and organs obtained at autopsy, despite the strongly negative public reaction to revelations of such practices at UK hospitals in recent years.

And sixth, while at this stage the opt-out system refers to organs from deceased persons, it could also apply to tissues, and if so does this have implications for consent regarding the use of foetal tissues that may be useful in treatment and which are obtained from miscarried or aborted foetuses?

In summary, arguments for an opt-out system are often based upon utilitarian analyses where the goal is to obtain a better outcome, whereas an opt-in system is more closely aligned with the ‘in principle’ view that consent in such matters must be obtained.
In a recent paper published in the ‘British Medical Journal’, John Fabre, Paul Murphy, and Rafael Matesanz examined Spain’s organ donor system against that in the United Kingdom. The results suggest that arguments about whether organ donor systems should be based on presumed consent are missing the point when it comes to increasing organ and tissue donation rates.

Spain has the highest rate of organ donation in the world (2.5 times higher than the UK) and is frequently cited as a successful example of presumed consent legislation. However, Spain does not have an opt-out register, nor is public awareness of the country’s 1979 ‘opt-out’ legislation promoted.

Spain’s excellent record on organ donation does not depend on its ‘presumed consent’ or its longstanding ‘opt-out’ legislation. A donor’s family is always asked for consent, and the family’s wishes are final. Organ donation has become a routine part of the conversation around end-of-life care in Spanish hospitals.

In the UK, which has an ‘opt-in’ organ donor policy, there is a refusal rate of about 40 per cent. Refusal rates are measured as the percentage of families of eligible potential donors who refuse to make the organs available. Spain’s refusal rate is about 15 per cent, while in Australia the rate is similar to the UK.

In 1989 donation rates in Spain and the UK were both about 14 per million population, representing a refusal rate of between 30-40 per cent. In Spain, however, that figure changed dramatically after the country introduced a comprehensive, national organ donation campaign. In the 12 years since, Spain’s refusal rate fell by more than half, while Britain’s has remained high.

According to the study’s authors, the difference between the British and Spanish rates is also attributable to Britain’s low provision of intensive care beds – about 27 per million population, compared to more than 87 in Spain. Doctors in the UK are less likely to allocate an intensive care bed to a patient with a poor prognosis. British doctors are also more likely to stop life support before brain stem death.

**Sources**

➤ ‘Presumed consent: a distraction in the quest for increasing rates of organ donation’, Authors John Fabre, Paul Murphy, Rafael Matesanz, BMJ 2010;341:doi:10.1136/bmj.c4973 (Published 18 October 2010).
Organ donation is just that – a gift from one to another

Prisoners should not be seen as a potential harvest of body parts, writes Helen MacDonald

National Organ Donor Awareness Week is almost on us, and as part of the quest to increase donor numbers a suggestion has been made that prison inmates are a source that could fruitfully be tapped (The Age 6/2/2007).

The case is argued by presenting the story of a prisoner who could donate a kidney to his cousin only after being reclassified to the lowest security risk so he could be hospitalised and qualify for Medicare payments. It is suggested that this case has tested all current assumptions that, for ethical reasons, prisoners cannot donate organs. But it did nothing of the kind. Turning prisoners into a new pool of donors would include much murkier transactions than this.

In the Philippines and some US states, proposals have been made to review the sentences of death-row inmates if they agree to ‘donate’ an organ. Though laws in most countries ban the sale of organs, this practice would effectively turn them into commodities. At the very least, it would be coercive ‘donating’.

If Australian prisoners were to be offered a remission in their sentences by agreeing to donate, other problems would also arise. Only two kinds of prison inmates would be tempted by the offer: those who were most vulnerable to abuse in the prison community and were desperate to shorten their time there; and those who had received lengthy sentences for crimes such as murder or rape.

This may cause problems for the recipients of these organs. Research shows that people are often anxious to know about the person whose organ they have received. While transplant professionals encourage them to view the organ as no more than a functional spare part, they cannot easily do so. This unease has been labelled the ‘Frankenstein syndrome’, and it may be magnified for a person who learns they have received an organ from someone who committed a heinous crime. In the US, transplant coordinators sometimes tell lies to protect recipients. One told a woman her donor was a ‘family man’, when he had been a pimp.

Viewing prison inmates as a source of organs also creates other problems. Prisoners are more likely than the general population to have health troubles of their own, in the form of being infected with hepatitis and/or HIV. This would normally preclude them from donating organs, but a solution has been suggested: these contaminated organs could be transplanted into recipients who already suffer from the same diseases.

Research shows that people are often anxious to know about the person whose organ they have received.

This plan would lead down a slippery slope towards the implementation of a two-tiered organ system in Australia, in which some people receive inferior organs, either for this reason or because they are otherwise low down on the waiting list and cannot afford to buy a healthy organ on the international black market. In places such as South Africa and China, organs can be bought from poor people who have nothing else to sell. In China, prisoners’ organs also enter the system after an execution, in deals that are said to involve gaining the prisoner’s or their family’s permission, though transplant surgeons around the world doubt this is the case.

There is a well-publicised mismatch between supply and demand where organs are concerned, and we are told that Australians are particularly parsimonious donors. Yet hundreds of thousands of us have signed donor cards. The problem actually lies elsewhere: after signing, we live on instead of dying, which means our organs will not be available for many years. And even when donors do die, that event is unlikely to take place in the ideal circumstances required for harvesting organs, that is in a hospital, preferably from massive brain damage, though increasingly organs are also being taken from patients after cardiac death and the planned withdrawal of life support.

Waiting lists for organs are also growing because more and more transplants are being performed. Patients who would once have been deemed a poor risk are receiving them, and when a transplanted organ fails, the recipient is given a second, sometimes a third organ.

In addition, transplants are sometimes performed before other strategies to relieve a person’s suffering. This controversially happened in France two years ago, when a woman whose face had been partially devoured by her dog became the world’s first face transplant recipient, in an operation that placed the surgeons who performed it into the prestigious category of transplant ‘firsts’.

All in all, transplanting organs is a complicated business. Many of us would make a living donation to someone we love, and have informed our families that when we die, we would like our organs to go to a needy stranger. But no one, including prisoners, should be inveigled into making such a decision on any other grounds.

Dr Helen MacDonald’s book, ‘Human Remains’ won a Victorian Premier’s Literary Award.

**Amish**

**Discussion:** The Amish will consent to transplantation if they believe it is for the wellbeing of the transplant recipient. The Amish are reluctant however, to donate their organs if the transplant outcomes are questionable. John Holster, 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 it. However, nothing in the Amish understanding of the *Bible* forbids the use of modern medical services, including surgery, hospitalisation, blood transfusions etc.

**Anglican**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** The offering of life to and for others reflects the Christian principle of interdependence within the human community. The role of hospital Chaplains as members of the professional team is vital in the maintenance of the spiritual and human dimensions of the organ transplant process.

**Australian Aboriginal**

**Discussion:** A single statement cannot be given as the Aboriginal population is made up of a number of individual communities.

**Baha’i Faith**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** There is nothing in the Baha’i teaching which forbids donation. The guardian of the Baha’i faith has stated “... it seems a noble thing to do”.

**Baptists**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** Organ donation is encouraged and supported as it is seen as an act of charity. The Church however, leaves the decision to donate up to the individual.

**Brethren**

**Discussion:** The Church of the Brethren’s Annual Conference in 1993 developed a resolution on organ and tissue donation, supporting and encouraging donation. They wrote that, “We have the opportunity to help others out of love for Christ, through the donation of organs and tissues”.

**Buddhism**

**Donation:** This is a matter of individual choice.  
**Transplantation:** Buddhist teaching on the middle path i.e. the avoiding of extremes may be applicable to these points. What is medicine to one may be poison to another. 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 honour those 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. Many families will not give permission to donate unless they know their loved one wanted to be a donor.  

**Discussion:** The Theravadan Buddhists believe organ donation is a matter of individual conscience. The Mahayanist Buddhists believe that even though one has stopped breathing at the time of death, consciousness may remain in the body for up to three years, depending on the individual’s karma. If however, one is involved in a fatal car accident, then they believe that consciousness abruptly and instantly leaves the body at the time of death.

**Catholic Church**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** “Transplantation presupposes a prior, explicit, free and conscious decision on the part of the donor, generally the closest relatives. It is a decision to offer, without reward, a part of one’s own body for the health and well being of another person. We should rejoice that medicine, in its service of life has found in organ transplantation a new way of serving the human family". (Pope John Paul II in an address to the Society of Organ Sharing, Rome, 20 June, 1991.)
Organ and Tissue Donation

**Christian Scientists**

*Donation: Individual decision*  
*Transplantation: Individual decision*  
*Discussion: The Church of Christ, Scientist doesn’t have a specific position regarding organ donation. Christian Scientists rely on spiritual instead of medical means of healing. They are free however, to choose whatever medical form of treatment they desire – including transplantation. Organ and tissue donation is an individual decision.*

**Church of Jesus Christ of Latter-day Saints (Mormons)**

*Donation: Individual decision*  
*Transplantation: Individual decision*  
*Discussion: The Church of Jesus Christ of Latter-day Saints made the following policy statement on June 3, 1974: "The question of whether one should will bodily organs to be used as transplants or for research after death must be answered from deep within the conscience of the individual involved. Those who seek counsel from the church on this subject are encouraged to review the advantages and disadvantages of doing so, to implore the Lord for inspiration and guidance, and then to take the course of action which should give a feeling of peace and comfort.”*  

**Episcopal**

*Discussion: The Episcopal Church passed a resolution in 1982 that recognises 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 Church**

*Donation: Acceptable*  
*Transplantation: Acceptable*  
*Discussion: The Greek Orthodox Church has no objection, whether doctrinal or moral, to the transplantation of organs on medical advice. The reception and donation of organs for this purpose reveal a profound act of loving solidarity and sacrifice among human persons. It is for this reason that the utmost care and respect should be shown at all times and at every phase of this service.*

**Gypsies**

*Donation: Generally opposed*  
*Transplantation: Generally opposed*  
*Discussion: Gypsies believe that for one year after a person dies, the soul retraces its steps. All of the parts of the body must be intact because the soul maintains a physical shape.*

**Hinduism**

*Donation: Acceptable*  
*Transplantation: Acceptable*  
*Discussion: The Hindu religion is based on the ‘Law of Karma’ and reincarnation. The soul lives forever, is immortal and gets reborn in a new physical forms. There is nothing in the Hindu religion indicating that part of the dead human body, cannot be used to alleviate the suffering of other humans. This act is an individual decision. H.L Trivedi, in *Transplantation Proceedings*, stated 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.”*  

**Islam**

*Donation: Acceptable*  
*Transplantation: Acceptable*  
*Discussion: In 1983, The Muslim Religious Council initially rejected organ donation by followers of Islam, but it has reversed its position, provided donors consent in writing prior to death. The organs of Muslim donors must be transplanted immediately. The religion strongly believes in the principle of saving human life. The majority of Muslim scholars belonging to various schools of Islamic Law have invoked the principle of priority of saving lives and have permitted the organ transplant as a necessity to procure that noble end.*

**Jehovah’s Witness**

*Donation: Individual decision*  
*Transplantation: Individual decision*  
*Discussion: According to the Watch Tower Society, the legal corporation for the religion, Jehovah’s Witness do not encourage organ donation, but believe it is a matter for individual conscience. Although the group is often assumed to ban transplantation because of its taboo against blood transfusion, it does not oppose donating or receiving organs. All organs and tissues, however, must be completely drained of blood before transplantation.*

**Judaism**

*Donation: Individual decision*  
*Transplantation: Individual decision*  
*Discussion: All four branches of Judaism (Orthodox, Conservative, Reform and Reconstructionist) support and encourage donation. According to Orthodox Rabbi Moses Tedler, chairman of the Bioethics Commission of the Rabbinical Council of America, “If one is in the position to donate an organ to save another 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 (Orthodox) approved organ donations as permissible, even required, from brain-dead patients. Both the Reform and Conservative movements also have policy statements strongly supporting donation. Given the complicated issue, and the number of factors that need to be taken into account, it would always be advisable for the parties involved to speak to their Rabbi if circumstances permit.*

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**Lutheran Church**

**Discussion:** The Lutheran Church does not oppose organ or tissue donation. The Lutheran Church believes that the decision to donate one’s organs and/or tissues should be left up to the individual.

**Maori**

**Donation:** Individual decision  
**Transplantation:** Individual decision  
**Discussion:** Maori people must be treated as individuals. Some will think traditionally, others will reject tradition, but the majority will lie somewhere in between. The most important consideration is that full discussion and consultation be carried out with the family and members of their land.

**Protestant**

**Discussion:** Protestants encourage and endorse organ donation. The Protestant faith respects an individual’s conscience and a person’s right to make decisions regarding his or her own body.

Rev. James W. Rassbach of the Board of Communication Services, Missouri-Synod, says: “We accept and believe that our Lord Jesus Christ came to give life and came to give it in abundance. Organ donations enable more abundant life, alleviate pain and suffering and are an expression of love in times of tragedy.”

**Pentecostal**

**Discussion:** Pentecostals believe that the decision to donate one’s organs and tissues donation should be left up to the individual.

**Presbyterian Church**

**Discussion:** Presbyterians encourage and support donation. They respect a person’s right to make decisions regarding their own body. During their General Assembly in 1995, they wrote strong support of donation and commented that they “encourage its members and friends to sign and carry universal donor cards ...”

**Reformed Church of Australia**

**Donation:** Acceptable except in dependant minors  
**Transplantation:** Acceptable  
**Discussion:** There are no biblical or principle objections to donation and transplantation for therapeutic purposes.

**Religious Society of Friends (Quakers)**

**Donation:** Acceptable  
**Transplantation:** Acceptable

**Salvation Army**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** It is essential that the rights of all individuals are respected and that free and informed consent be obtained from the next of kin. The giving of human organs makes possible a richer life and the alleviation of others’ suffering.

**Seventh Day Adventist Church**

**Donation:** Individual decision  
**Transplantation:** Individual decision  
**Discussion:** Although transplant procedures are carried out at many Seventh Day Adventist health care institutions around the world, the church has made no formal declaration regarding organ donation and transplantation.

**Shinto**

**Donation:** Not acceptable  
**Transplantation:** Acceptable to some  
**Discussion:** 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... the Japanese regard it 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. For this reason organ donation is often considered unacceptable by the Shinto religion.

**Unitarian Universalist**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** When the patient and physicians believe that such operations will be beneficial to the patient and when the donor is not harmed, the church affirms that guidance.

**Uniting Church in Australia (Synod of Victoria)**

**Donation:** Acceptable  
**Transplantation:** Acceptable  
**Discussion:** The church recommends that members be encouraged to volunteer to become organ donors and that those who are willing to become organ donors take appropriate action to make their wishes known. Most important of all is to have frank and specific discussions within the family, so that other members of the family, specifically next of kin, understand the wishes of the person or persons concerned and are prepared to see these wishes carried out when the opportunity arises. Action should be taken to make these wishes known in some durable written format.

**Wesleyan Church**

**Discussion:** The Wesleyan Church supports donation as a way of helping others. It believes that God’s “ability to resurrect us is not dependent on whether or not all our parts were connected at death.” It also supports research and in 1989 noted in a task force on public morals and social concerns that “one of the ways that a Christian can do good is to request that their body be donated to a medical school for use in teaching.”

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The National Health and Medical Research Council is currently undertaking a routine review of its guidelines on the ethical issues surrounding organ and tissue donations after death. A three-month period of public consultation has just concluded.

We wish to clarify some of these ethical issues following potentially confusing information in recent media coverage. This is of concern to us because the information might have an adverse impact on the donation rate of critically-needed organs and tissues.

Suggestions in the media have been that in order to increase organ donation rates, health authorities are under pressure to allow doctors to obtain organs from patients who are still ‘technically alive’.

The NHMRC wishes to reassure the public that this will not occur. It will continue to be illegal and unethical to remove organs before people are dead.

There is also no intention or need to change the definition of death to facilitate organ donations, or for any other purpose. Doctors can make a diagnosis of death when there has been cessation of all brain function, or cessation of the circulation for such time that it cannot resume.

Where a patient is diagnosed as brain dead, medical teams can use life support techniques to keep circulation and breathing going to keep organs in good condition until they are transplanted.

One area that is being debated within NHMRC as well as in the community is where brain death has not occurred but cardiac death is imminent.

New technologies mean that in such circumstances non-harmful ‘ante-mortem’ procedures are possible. Ante-mortem procedures include injecting drugs such as anticoagulants that will not affect the patient’s health, but will maximise the preservation of organs after death has occurred.

Many people think that this is reasonable when no harm is possible and there has been specific prior consent to ante-mortem procedures. In such circumstances the procedures are making the patient’s express wish to donate much more effective.

Others say that ante-mortem procedures in such circumstances are unacceptable because the procedures are benefiting someone other than the patient.

The NHMRC welcomes community input on ethical issues because our guidelines must reflect current community values and thinking. We have received 73 submissions to our call for public comment, and they will all be carefully considered before we reach a final position, which will be by the end of the year.

QUESTIONS AND ANSWERS
Organ and tissue donation after death

Q. How do I register my consent to become an organ and/or tissue donor?

Only people aged 18 years or over can register their consent on the Australian Organ Donor Register. If you are 16 or 17 years old you can register your intent (or objection) to donate. For people under 18, consent will be discussed with a family member at the time of death (should such a sad occasion arise).

Forms are available at any Medicare Office or you can register online at www.medicareaustralia.gov.au. It is important to discuss your decision to be an organ and/or tissue donor with your family, partner or friends.

Q. Who can donate organs and/or tissues?

There is no age limit. While your age and medical history will be considered, you shouldn’t assume you are too old or not healthy enough to indicate that you want your organs to be made available for transplant.
Q. What if I don’t want to donate any organs or tissues after I die?
   This is completely up to you. You can register your objection on the Australian Organ Donor Register. Again, the most important thing to do is talk to your family and friends of your decision.

Q. Can my family overrule my wishes?
   Yes, although families rarely overrule the wishes of their loved one if they know what they wanted. If they don’t know your wishes, the decision is much harder for them.

Q. Can a doctor involved with the potential organ recipient make decisions about my death?
   No. There must be complete separation of roles between those involved in the care of the patient and family, and those involved in organ retrieval or care of the recipient.

Q. Who makes the diagnosis of death?
   A doctor independent of the organ and tissue procurement or transplant team is the only one who can declare death. Formal tests are carried out on the patient by two experienced medical practitioners to establish whether brain death has occurred.

Q. What is the difference between brain dead and being in a coma?
   A patient in a coma is unconscious because their brain is injured in some way, although their brain continues to function and may heal.
   Available medical tests can clearly show the difference between brain death and coma.

Q. How can patients who are brain dead appear to be alive?
   Despite loss of all brain function, respiration and circulation can be maintained for prolonged periods in an intensive care unit. Through medical intervention, the deceased may seem to be alive during this time.

ORGAN DONATION IS POSSIBLE AFTER BRAIN DEATH

In some cases, a person who is brain dead may be a candidate for organ donation.

- If the person was a registered organ donor, or if their family knew of their wish to be an organ donor, their death is declared but the ventilator is left on.
- Drugs that help preserve the internal organs are still given. The dead person then undergoes an operation to remove viable organs such as kidneys.
- After the operation is complete, the ventilator is switched off. Funeral arrangements can then be made by the family.

Source: Brain death fact sheet
Better Health Channel | www.betterhealth.vic.gov.au
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Q. Are there any cases where a patient was certified as brain dead and later woke up?
   No. Sometimes in news stories, the words ‘brain dead’ are used incorrectly. The patients who woke up were in a deep coma but their brains still had some ongoing function and blood supply to the brain.

Q. Are there circumstances when organs can be donated where death has been diagnosed as a result of cessation of circulation, i.e. ‘cardiac death’.
   Yes. With advances in technology it is now possible to donate organs after a person’s heart has stopped beating, but this is rare. This is known as donation after cardiac death. Maximising the preservation of organs after death generally requires some treatments before the person dies, usually through intravenous means.

Q. Is the care of the patient compromised by the need to preserve organs?
   No. The health of the patient always takes precedence over the interests of organ and tissue donation.

Q. How are organs removed?
   Organs and tissues are removed by highly skilled surgeons in an operating theatre.

Q. Will donation disfigure my body?
   There is no disfigurement, but there may be surgical incisions. Any incisions are sutured (stitched), closed and covered with a dressing, as with all operations. The donor’s body is always treated with dignity and respect.

SIGNS OF BRAIN DEATH

Some of the signs of brain death include:
- The pupils don’t respond to light
- The person shows no reaction to pain
- The eyes don’t blink when the eye surface is touched (corneal reflex)
- The eyes don’t move when the head is moved (oculocephalic reflex)
- The eyes don’t move when ice water is poured into the ear (oculovestibular reflex)
- There is no gagging reflex when the back of the throat is touched
- The person doesn’t breathe when the ventilator is switched off
- An electroencephalogram test shows no brain activity at all.

Source: Brain death fact sheet
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Some very careful thought needs to go into criteria that are acceptable for the difficult questions surrounding the determination of death, according to this overview from the Southern Cross Bioethics Institute.

Organs available for transplantation from deceased donors in Australia are failing to meet the needs of the individuals on organ transplant waiting lists each year. It is plain to see that an increase in supply of donated organs will improve this disparity and benefit greater numbers of transplant recipients, however some solutions suggested recently in Australia and abroad are intertwined with undesirable ethical costs. Two solutions that have received attention recently include: implementation of an opt-out organ donation system, and a change to the dead donor rule.

Organ transplantation and the dead donor rule

Organ donation has been widely promoted as a powerful expression of altruism and as a gift of life. Organs like kidneys as well as sections of lung and liver can be removed from living donors, but vital organs like the heart cannot – for obvious reasons. The most common occurrence is that individuals consent to organs being removed after death, or if they are not able to consent, their next of kin may do so. But the crucial point is that it must occur after death. This is called the ‘dead donor rule’, and most ethicists as well as medical professionals agree. For to remove vital organs from patients who are not dead, or for whom there is uncertainty about whether they are dead, is to bring about their death by removing their vital organs. That is to kill them.

There are two ways in which death has been defined, brain death and cardiac death.

In a recent paper in the New England Journal of Medicine, heart transplant surgeons described how they modified the definition of death for three brain-damaged infants whose hearts were removed for transplantation into three other infants with severe heart problems. The controversy surrounds the likelihood that the children were not in fact dead.

The journal invited two bioethicists, Robert Truog and Franklin Miller, to write a commentary, which is when the controversy really began to deepen. The essential line taken by Truog and Miller is that it really doesn’t matter whether the patient is dead or not. Instead what really counts is whether informed consent has been given. In their assertion that it is “perfectly ethical” to remove organs from patients who are not really or convincingly dead, they give voice to the utilitarian ethic, which is that the outcome – organs that save people’s lives – is really so good that traditionally unethical means can be justified.

There are two ways in which death has been defined, brain death and cardiac death.

Brain death criteria were proposed in 1968 by a Harvard Medical School Committee and, though controversial, have since been established as sufficient for a declaration of death in cases of patients suffering “devastating neurological injury [and] suitable for organ transplantation under the dead donor rule”. Truog and Miller think the concept of brain death has “served us well” because without it, procuring organs would not happen and so organs for transplantation would be scarce. Rather than the concept being right, they instead consider “being served well” to be what counts.

Crucially, Truog and Miller agree with the concerns expressed by many over the years that the concept of brain death is flawed, as is the concept of cardiac death. Indeed, in the paper...
regarding heart transplants from brain-damaged infants, not only were the infants not declared brain dead, but a mere 75 seconds was allowed to pass from the heart stopping to organ removal. This is significantly less than the 2-5 minutes usually used to declare cardiac death. Instead of cardiac function having irreversibly ceased, Truog and Miller instead suggest that, “... in this context irreversibility is interpreted as the result of a choice not to reverse.” In this they are correct.

For Truog and Miller to construct an argument that it doesn't really matter whether donors are dead or not, they rely on a utilitarian argument that denies a well-established principle of medical ethics – the principle of double effect. In this context, this principle says that it can be ethically sound to withdraw treatment from someone if the treatment is futile or burdensome disproportionate to benefit. So an infant can have life support withdrawn and then die from the underlying cause. The person turning off the life support does not intend to end the child's life, but foresees that death will occur from whatever condition the child suffers from.

The principle of double effect operates in the tragic reality of some end of life scenarios to nevertheless uphold the value of life itself and it never permits an intentional act to end life. But Truog and Miller instead endorse the utilitarian ethic that only consequences really matter. They would have us believe that turning off life support is what actually kills the child. This then allows them to equate removing life support with removing organs.

In both cases, they argue, death follows by the hand of a medical professional. Their argument is, quite literally, deadly. They say, “whether death occurs as the result of ventilator withdrawal or organ procurement, the ethically relevant precondition is valid consent by the patient or surrogate. With such consent, there is no harm or wrong done in retrieving vital organs before death, provided that anesthesia is administered.”

One of the problems with such an argument is that it not only fails to recognise the inherent dignity of the infant and his or her sanctity of life, but also ignores the virtue (or lack of it) of a physician prepared to carry out such an act. Furthermore, the likelihood that public trust will be undermined by the knowledge that vital organs will be procured from live donors doesn't rate a mention. The utilitarian calculus can be selective when it comes to “harm or wrong done”.

While Truog and Miller restrict their argument to “the limited conditions of devastating neurologic injury”, they provide no argument as to why – which is disconcerting because there appears to be no sound reason why their argument could not apply far more widely. In fact pro-euthanasia advocates would no doubt be pleased to see unfettered autonomy promoted as the only really significant ethical point to make in such end of life scenarios. Could we soon see euthanasia linked to organ donation? Could the 'altruism card' of organ donation be played to add nobility to an otherwise morbid cause?

What the NEJM study and Truog and Miller’s commentary does highlight is that for the dead donor rule to remain as a primary principle in the ethics of organ donation, some very careful thought needs to go into criteria that are acceptable for the difficult questions surrounding the determination of death.

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Death fiction and taking organs from the living

Our failure to give our organs to those who need them is among our greatest moral failures, assert Oxford University ethicists Julian Savulescu and Dominic Wilkinson

Imagine you could save six lives with a drop of your blood. Would you have a moral obligation to donate a drop of blood to save six people’s lives? It seems that if any sort of moral obligation exists, you have a moral obligation to save six lives with just a pinprick of your blood.

But every day people do far worse than failing to give a drop of blood to save six lives. They choose to bury or burn their organs after their death, rather than save six lives with these organs. And it would cost them nothing to give those organs after their death. Our failure to give our organs to those who need them is among the greatest moral failures of our lives. At zero cost to themselves, not even having to endure a pinprick, many people choose to destroy their lifesaving organs after their death.

In the UK, 1,000 people per year die on the transplant waiting list. In the US, 18 patients per day die waiting. Australia’s organ donation rate is one of the lowest in the Western world. Those who choose to donate deserve a moral gold star. The most pressing ethical concern is how we can encourage more people to consent to donate their organs, and how we can make sure that those who want to donate their organs are able to.

So it is in one way surprising that a Melbourne intensive care physician, Jim Tibballs, is reported as criticising current organ donation guidelines on the grounds that donors are not actually dead at the time that organs are removed. Other doctors have called Professor Tibballs’ comments ‘irresponsible’ on the grounds that they might cause a significant fall in organ donation rates. Tibballs claims that current legal standards of death — either brain death or cardiac death — are not being met. He claims that organs are being taken from people who are dying rather than dead. Whether or not this is true, there is no dispute on one issue: organs are not being taken from people who would have lived if their organs had not been taken.

The ethics of organ transplantation have been dominated by one rule — that organs may only be removed from patients who are dead. The dead donor rule. In the 1960s it was recognised that some patients could be kept ‘alive’ with machines in intensive care after all functions of their brain had been irreversibly lost. Death was redefined to enable organs to be taken from people whose brains were irreversibly and profoundly damaged. Such people were defined as ‘brain dead’.

What counts as the precise moment of death is arbitrarily determined. This is because death is a gradual process, with organs dying at different rates. And, within a certain range, it does not matter morally where we draw the line. So for this reason, death is defined differently in different places. In Australia, the legal definition involves death of the brain stem, which is necessary for vital functions. In the US, it is death of the whole brain. The Japanese do not use the concept of brain death at all.

When we recognise the ‘fiction’ of defining the precise moment of death, or that it is a definitional issue of drawing a line in a process for the sake of some purpose, we can identify one way to increase the supply of organs. Change the definition of death again. Tibballs’ concerns are legal concerns, not fundamentally ethical concerns. We could move the definitional point of death slightly earlier into the dying process to account for his worries.

But there is another more radical way to increase the supply of organs. We could abandon the dead donor rule. We could for example, allow organs to be taken from people who are not brain dead, but who have suffered such severe injury that they would be permanently unconscious, like Terry Schiavo, who would be allowed to die anyway by removal of their medical treatment.

Many will find it abhorrent to think of taking organs from a person who is still alive, even if this is to save many lives. But some would not. We would prefer our organs to be taken if we were permanently unconscious and our treatment was about to be withdrawn and we would die, once and for all. There may be others like us, who would want their organs to be taken if they had no chance of meaningful life and they were going to die soon.

Many people die in intensive care. After a critical illness some are found to have lost all function of their brain and brain stem. Life support machines are turned off. Others are alive, but have such a low chance of any meaningful recovery that their doctors, in consultation with their loved ones, remove life support and allow them to die. Both of these sorts of patients may be able to donate their organs, but at present the focus is on the question ‘are they dead?’.

We believe people should be offered the choice to donate their organs before they have died. And those wishes must be respected. After all, they are the altruistic ones who are prepared to do what they should do. It would fail to respect their autonomy and wishes if we did not take their organs, if they had explicitly requested it.

We have two options — we could further revise the definition of death, though it may leave us vulnerable to the criticism that we are gerrymandering the definition to suit our purposes. Alternatively we could move away from an emphasis on death, to an emphasis on the really important moral question: is organ donation consistent with the wishes of the patient, and can it harm them to donate their organs?

A patient whose life support is being removed because their prognosis is extremely poor cannot be harmed by donating their organs (as long as it is ensured that they do not suffer). If they would have wanted to donate their organs, we should do what we can to respect their wishes.

We should do whatever we ethically can to stop people burying and burning the most valuable human resource. At very least, we should allow the morally virtuous to give their organs just as they wish.
THE DEATH OF A PATIENT IS JUDGED BY THE MOST STRINGENT STANDARDS, OBSERVES ASSOCIATE PROFESSOR BILL SILvester

In Australia and New Zealand, the guidelines are determined by the Australian and New Zealand Intensive Care Society (ANZICS) and endorsed by the National Health and Medical Research Council (NHMRC). Almost identical guidelines are followed in Britain, the US, Canada and Europe.

The NHMRC, through its Australian Health Ethics Committee, reviewed its organ and tissue donation guidelines in 2006, leading to the release in 2007 of its publication Organ and Tissue Donation After Death, for Transplantation: Guidelines for Ethical Practice for Health Professionals. These guidelines outline the ethical principles for Australian health professionals involved in organ donation after death. They confirm that the existing guidelines comply with the legislation throughout Australia in the state and territory Human Tissue acts for the removal of organs for transplantation. Furthermore, ANZICS conducted a periodical review of the guidelines this year. Having re-examined the international medical literature, the revised guidelines maintain complete confidence in the existing testing procedures.

It is important to state that there has never been a single reported case of correctly diagnosed brain death where the patient has subsequently survived. When I am speaking to the family of a patient whose brain has just died, it is of crucial importance to convey the certainty of the diagnosis. They are hearing, from a doctor that they hardly know, that there is no hope for their loved one who is lying in a bed in the ICU, whose chest is going up and down as the ventilator pushes air into the lungs, with warm hands and feet and a beating heart, looking like he or she is just asleep.

It is following this understanding and acceptance of the death of their loved one that the intensive care specialist raises the possibility of organ donation with the family. There is no other time to raise this because there is only a matter of time before those organs start deteriorating, following the death of the brain.

It never fails to amaze me how bereaved families, in the midst of the struggle with their loss, are prepared to briefly put their grief aside to consider, and agree to, the unconditional donation of their loved one’s organs to help other people that they will never know and never meet.

Some families struggle with this decision when they do not know the views of their loved one regarding organ donation. When they do know, however, that he or she wished to be an organ donor, the vast majority of families support donation, often enthusiastically. They frequently say that “this is the only positive thing that can come out of this tragedy” or “we can fulfil/honour his/her wishes”.

As a consequence we always encourage the public to talk about organ donation with other family members so that if tragedy does strike unexpectedly, then the family is not left struggling with this decision. We also encourage people to register their wishes through the Australian Organ Donor Register. Although intensive care specialists support organ transplantation, our primary motivation is always to do whatever is in the best interests of our critically ill patients and to care for their families.

An integral part of this responsibility is to raise the possibility of organ donation when we have reached a point where nothing else can be done to help the patient to survive. Indeed, we feel an obligation to make the family aware of this possibility because the patient may have previously expressed clear views about being a potential organ donor.

Associate Professor Bill Silvester is medical director of LifeGift (Victorian Organ Donation Service) and Senior Intensive Care Specialist at the Austin Hospital.
The theatre doors open, you’re wheeled in with one set of lungs, and four hours later you’re wheeled out with a completely different set. The theatre doors close, but another door opens to a totally new life, a life in which every breath is not a struggle, a flight of stairs is not an impossible challenge and you don’t have to carry a pager to alert you that your new organs are ready and waiting. This is the wonderful reality of being the recipient of a new set of organs.

But the flip side of this new life is the end of someone else’s. The decision to donate a loved one’s organs must be one of the most difficult of all. Western society handles end of life decisions poorly, and the suddenness of the events that lead to organ donation leaves most families shocked and hurting. This helps to explain the relative dearth of organ donation in Australia, despite years of efforts to raise community awareness about the shortage of donors and the time people must spend on waiting lists until their lucky number comes up. Alarmist and unfounded views on the procedures for organ donation contribute to the public’s reluctance to become organ donors themselves. With donor rates of about 200 per year, or 10 per million, and transplant waiting lists sitting at around 1,700 people, some patients will never receive the organ they need and will die waiting.

With donor rates of about 200 per year, or 10 per million, and transplant waiting lists sitting at around 1,700 people, some patients will never receive the organ they need and will die waiting.

Because of this need for organs, new procedures have been developed around the Western world to increase the pool of potential donors. Opt-out rather than opt-in systems are one approach; another is a process that forces people to decide one way or the other when they renew their driver’s licence. Both have been tried with varying degrees of success. More radical ideas include giving priority for organs to people who have already agreed to be an organ donor. But none of these ideas has been tried in Australia. In the case of kidneys, living related donors are available to increase the opportunity for recipients, but although the same option is technically possible for lung transplants it has not been tested in Australia either.

Changes in technology have increased the pool of donors. Better organ preservation solutions have been developed, and new organ transport devices can mimic the body’s cardiac function, keeping organs functioning over the sometimes long distances between donor and recipient. Advances in surgical techniques, including performing ‘domino’ surgery in heart/lung transplantation,
have increased the rate of use of the available organs.

But perhaps the most significant, and certainly the most controversial advance in organ donation and transplantation has occurred in the last four years with the advent of ‘donation after cardiac death’, or DCD. To understand the ethical controversies around this new development, it is essential to understand the process by which organ donation occurs – especially with some media outlets relaying rumours of patients having organs removed while they are still alive or families being pressured into giving consent for organ donation by overzealous medical staff. The depiction of organ donation processes in TV programs like Grey’s Anatomy further clouds the public’s perception of the organ donation process.

Essentially, in order for an organ donation to occur a complex series of steps is carried out by different teams of people, usually at different hospitals and often in different states. Potential organ donors are identified by medical staff, usually in the intensive care unit, at the point when patients are either brain dead or have no reasonable chance of emerging from a coma.

To reach a diagnosis that a patient is brain dead – a state in which the higher functions of the cerebral cortex have stopped working but the heart is still beating – two different medical specialists must perform a number of tests to determine that brain activity has ceased. Neither specialist can be caring for the potential transplant recipient. If there is any doubt about the diagnosis then an angiogram of the brain will determine if there is blood flow through the cerebral tissues.

Once brain death has been established and consent from next of kin is obtained, the organ donor coordinators are notified. These doctors and nurses are independent of the hospital and work for LifeGift, an arm of the federal government’s organ and tissue donation network. They will assess the potential donor in consultation with the intensive care staff and liaise with the families to explain the process. The donor coordinators notify the transplant coordinators at the transplant units where the recipient is waiting. The recipient coordinators will then liaise with the transplant specialists to determine appropriate recipients for the organs. The final step is for specialist transplant surgeons to travel to the donor hospital, stop the patient’s heart and remove the organs and return with them to the transplant units where they will be implanted in the recipients.

In DCD donation, however, the patient is not brain dead. He or she is being heavily supported by medical technology, on a ventilator and usually on multiple medications to maintain blood pressure and heart rate. In this group of patients, usually with significant head injury, a decision must be made as to their likelihood of regaining consciousness.

In this process, the next of kin are the drivers of the timing and nature of the donation. It is often the families that suggest organ donation, even in cases where it is not medically appropriate. The family has an opportunity to say their goodbyes, and the ventilator is switched off and nature is allowed to take its course. If the heart does not stop spontaneously within ninety minutes then the procedure is abandoned. These patients will succumb within hours or days. If the heart does stop then the patient is moved to the operating theatre and the organs are removed for implantation.

The ethical issues that arise in donation after cardiac death are many, but essentially boil down to the question of whether it is morally reasonable to withdraw treatment from a non-brain dead person who has no feasible chance of recovery in order to use their organs to benefit others. Significant ethical debate has ensued around this issue, and there continue to be arguments at transplant conferences about the ethics of the decision.

But while Australia’s donation rates remain as low as they are then it seems safest to be guided by John Stuart Mill’s utilitarian ideal, “the greatest good for the greatest number.”

Chris Merry is a Melbourne-based surgeon and 3RRR broadcaster.

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Each type of living donation involves asking ethical questions. This is because the treatment affects not only the people in need of transplants but also the healthy individuals who volunteer to donate. Living donors have operations that do not benefit them and may even cause them harm.

Before living donation can go ahead, the person who wishes to donate must understand that the donation may affect their physical health and their mental wellbeing. The chances of there being problems after donation will depend on the type of donation.

For example, the chances of problems after bone marrow donation are quite small. Kidney or liver donation involve a more serious operation so it is more likely that there could be problems afterwards. The bigger the risk of harm to the donor, the greater the ethical concern.

There are important ethical standards that must be met before living donation can go ahead:

- Donors must understand and accept the risk to themselves
- There must be a very low chance of harm to the donor's physical or mental health, straight away or in the future, and
- There must be a very high chance that the transplant will be successful.

Overall, the wellbeing of the donor must be considered above the health of the person who needs the transplant.

Living donation by children and adults who cannot make their own decisions is even more difficult. This is because:

- Children and dependent adults are very vulnerable and must be protected
- It may be difficult to make sure they understand what is involved, and

Extracts from a booklet by the National Health and Medical Research Council to assist people thinking through the ethical issues and making decisions about living donation of organs and tissues.
Parents or guardians may be in the situation where they are making decisions for the donor and the recipient.

Because of these difficulties, an independent team needs to decide whether the donation would be in the child or dependent adult’s best interests.

**PRINCIPLES OF ETHICAL LIVING DONATION**

People must be in good physical and mental health before they can become living donors. There are some important principles that must be followed as well, to make sure that every living donation is ethically acceptable.

**Living donation must be altruistic**

Altruism means that the donor is thinking only about the other person and is not expecting to receive rewards.

**The decision to donate must be free and voluntary**

People should not be forced or influenced by emotional pressures or promises of rewards like money.

**Both donors and recipients must be fully informed**

Donors and recipients need clear information so that they can understand what the risks are and what might happen in the future.

**Everyone involved in the decision-making process must be treated with respect and care**

Whether a donation goes ahead or not, the donor assessment and transplant teams follow the ethical principles outlined in this booklet and work towards the best possible results for the donor and recipient.

**Cultural issues must be considered in planning programs and working with families**

Translators are important to give information to people whose first language is not English. The health professionals involved need to understand and be sensitive to the ways in which culture and beliefs can influence decisions about donation.

**EMERGING ETHICAL CONCERNS**

The growing demand for organs and tissues means that waiting lists are getting longer. The wait for an organ can be long and sometimes life-threatening for someone without a friend or relative who can make a donation. A number of new practices have developed overseas to help people without suitable living donors.

**Paired donation** aims to help people go through with living donation even when the kidney donor and potential recipient are not matched. The unmatched pair is combined with another unmatched pair. The two pairs ‘exchange’ organs and both avoid the waiting list. Paired donation currently takes place in the US and the Netherlands. In Australia, this type of donation is only legal in WA.

**List exchange** acts as an organ ‘matching’ service. A donor who does not have a match with his or her intended recipient offers to donate to a stranger on the waiting list. In return, the intended recipient is given priority for an organ from a deceased donor. This practice does not currently occur in Australia.

There are ethically unacceptable practices that provide other sources of organs. These include internet sites that match donors and recipients for a profit, appeals by organisations (e.g. community groups) on behalf of recipients, and potential recipients advertising for organs through the media (e.g. placing advertisements, generating news stories).

These practices are unethical because:

- They favour people who have access to a particular media or group
- They may involve costs, and
- They do not take account of who needs the organ most.

There are also organ ‘black markets’, where people in developing countries sell their organs to foreigners who want to bypass the waiting list in their own country. This takes advantage of donors, many of whom are poor and helpless. Because there may not be a full assessment before donation, it can lead to serious health problems for both donors and recipients (e.g. the person receiving the transplant becoming infected with a disease from the donor).

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**BEFORE YOU DECIDE**

*Here are some questions to ask yourself as you decide.*

- Have I been given enough information to understand the donation procedure, the possible risks involved and what happens afterwards?
- Am I aware of the chance of success of the transplant and the likely benefits to the recipient?
- If I decide not to donate, what is the alternative for the recipient and how long is he or she likely to have to wait for an organ from a dead donor?
- How will I feel if the recipient of my organ continues to have ill health or dies after the transplantation?
- How will I cope with changes to my own health if there are problems after the donation?
- How will I feel knowing that my organ is inside someone else’s body?
- How will the donation affect my relationship with the recipient?
- How will my family react to my decision?
- How will I feel if I choose not to donate?
- How do I feel about making a decision on behalf of my child or a dependent adult in my care?

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Extract from *Making a Decision about Living Organ and Tissue Donation* © National Health and Medical Research Council

www.nhmrc.gov.au

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There are about 20 million spare kidneys in Australia – one for each man, woman and child: and a kidney given for financial gain works just as well as one donated benevolently. That’s why it is obscene that there are thousands of Australians who spend years on dialysis, waiting for a life-saving kidney that often never comes. Opinion by Mirko Bagaric

Netherlands-based TV program Big Donor should be commended for highlighting the dispiriting plight endured by people with kidney failure. In the show, a terminally ill woman with the assistance of viewers was to select one of three candidates to receive one of her kidneys.

The show turned out to be a cleverly crafted hoax, designed to draw attention to the shortage of donor kidneys. The donor was in fact an actress rather than a terminally ill cancer sufferer.

Prior to being announced as a stunt the show attracted world-wide international condemnation. Dutch legislator Joop Atsma blasted the show because it allowed the audience to play “referee on what could be a matter of life and death”.

To the contrary, the program should be praised for illustrating the highly questionable choices that we as a community condone regarding cardinal moral issues.

Doctors and hospitals make decisions regarding life and death daily. Life-saving body parts are in scarce supply, as are expensive drugs and certain forms of medical treatment. Who should live and who should die is the most fundamental moral issue of our time – and indeed at any time in history.

Decisions of this nature involve highly controversial and contestable judgments regarding the worth of human life. The line that all human life is intrinsically important doesn’t cut it when there is one life-saving kidney but 100 needy patients. In such circumstances it is necessary to decide which life is most valuable.

Momentous decisions of this nature are acutely difficult, but that is all the more reason that they must be made within a transparent framework, which engages the preferences and wisdom of the entire community, as opposed to the whims of well-intentioned, yet sometimes ethically barren medics.

When we are confronted with difficult ethical choices, in my view the morally correct decision is the one that will maximise net human flourishing, where each person’s interests count equally. In the donor situation, this means preferring the potential recipient who needs it most (i.e. is closest to death) and who, on the basis of age and talent, is likely to contribute most to the community.

The government should set a minimum price for a kidney. This should reflect the pain and suffering involved in donating the organ and the increased risk to the donor’s future health.

Many people will disagree with this framework. And it is exactly for this reason that we need wide-ranging community debate on the issue. Big Donor will no doubt fuel this discussion. Moreover, the show will highlight the incalculable and unnecessary suffering that our medical system inflicts on sick patients.

In Australia about 9,000 people are alive on dialysis and only about 5 per cent of patients are offered a kidney transplant in any year. The average waiting time for a transplant is four years. About one patient a week dies waiting for a kidney. The cost of dialysis is over $500 million per year.

The reason that so many people are undergoing dialysis and dying due to kidney failure is simply because people lack the incentive to give up their spare kidney.

As with most disconnects between need and supply, there is a ready solution: money. The current ban on being paid for kidney donations is misguided and indecently paternalistic.

The government should set a minimum price that will be paid by the health system for a kidney. This should reflect the pain and suffering involved in donating the organ and the increased risk to the donor’s future health. Once this threshold,
say $50,000, is set hospitals should be able to purchase kidneys at sums not below this amount. The purchase price should increase until equilibrium emerges between demand and supply of kidneys.

But won’t this lead to the exploitation of the poor who will be coerced into selling their kidneys? No.

While there is no doubt that the poor will disproportionately sell their kidneys, this no more amounts to exploitation than the fact that it is the same people who spend their lives selling their labour cheaply to the wealthy, in the form of cleaning toilets and working in (legal) brothels.

While some kidney donors might blow the $50,000 plus, many will use it wisely as a springboard for financial security by, for example, using it as a home deposit. Poor people are financially challenged. But they are not dumb. They are capable of making informed, self-regarding autonomous choices.

Our bodies are ... the one asset that is possessed equally by the rich and the poor. There is no principled basis for not allowing the poor to recoup this asset.

Our bodies are no less an asset than our time and resourcefulness. In fact this is the one asset that is possessed equally by the rich and the poor. There is no principled basis for not allowing the poor to recoup this asset.

The fallacy of the argument that benevolence should be the only motivation driving organ transplants is highlighted by the fact surgeons and hospitals make thousands of dollars transplanting organs, as do drug companies who provide follow up medication. The only person who misses out on the cash is the one that gave the most – the donor. Rarely is paternalism so vulgar.

Of course, some kidney donors down the track will themselves require a kidney transplant if their only kidney fails. But this won’t be problem, because under the proposed scheme there will always be a ready supply of donors at any point in time.

Critics will object that this proposal will lead us down the slippery slope of (suicidal) people wanting to sell hearts and other non-spare parts organs. They are wrong. A clear distinction can be made between essential and non-essential organs and body parts – such as kidneys and bone marrow.

Law-makers need to take of heed of this – it is a matter of life and death.

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He is the author of 20 books and over 100 refereed scholarly articles. He is not connected with any political party or other interest group.

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On Line Opinion, posted 12 June 2007
www.onlineopinion.com.au
Australians are helping fuel a predatory international transplant trade by travelling overseas to buy organs illegally. Simon Lauder reports for ABC News

The Transplantation Society says there are still Australians willing to ignore health and ethical considerations to source organs on the overseas market. Transplantation Society past president Dr Jeremy Chapman says so-called organ tourists continue to escape punishment, despite the trade being illegal.

"There are a few instances of patients returning from overseas said to have had an organ," he said.

"I know of one patient who was heading for a country overseas; told the unit that they would be unable to come in for dialysis overseas because they were shooting her donor tomorrow."

Dr Chapman says the number of commercial transplants globally has dropped from about 10,000 to 2,000 in the past few years, creating an enormous demand for organs.

"The demand comes from the fact there are too many people wanting too few organs in every country of the world," he said.

"So wherever there are rich people, they’re preying on where there are poor people."

Canadian human rights lawyer David Matas says he has uncovered evidence of organ harvesting from death row inmates and political prisoners in China.

He says evidence suggests that most of the 10,000 organ transplants which happen each year in China are the result of organ harvesting.

"We had investigators phoning in to Chinese hospitals, asking the hospitals if they had organs of Falun Gong practitioners to sell and we get admissions throughout China, which we have on tape saying, 'Yes we do', or 'No we don’t, but you can go to this hospital'," he said.

"We’ve got these advertisements for short waiting times on hospital wait sites at big prices and the short waiting times mean somebody’s being killed for their organs on demand when the patients arrive."

SUSPICIOUS CASES

Australian and New Zealand Society of Nephrology president Professor Randall Faull says he is also aware of suspicious cases.

"I’ve been reasonably closely involved in a couple of instances where a patient who’s been on regular dialysis has suddenly disappeared without notice and then has returned several weeks later with a transplant and had admitted that they’d gone to another country and got the transplant," he said.

Professor Faull says he is not aware of anyone being penalised for buying organs.

"In my limited personal experience with a couple of cases of this, the individuals have come back to Australia and their treatment has been continued and they’ve, not to my knowledge, received any direct punishment," Professor Faull said.

Moves to combat so-called transplant tourism have gathered pace in recent years. Many countries previously targeted by people needing new organs, including China, the Philippines and Pakistan, have introduced laws against organ trafficking.

Most countries in the world are also signatories to the Istanbul declaration against organ trading. But Dr Chapman says the only way to stamp out illegal organ trading is for each country to cater for its own needs.

"We have to work hard in every country of the world to ensure that patients do not need to go and perform illegal acts to save what they think are their lives, by undertaking very risky procedures in unhygienic places for large sums of money," he said.

Professor of transplantation surgery at the Royal Prince Alfred Hospital Richard Allen says it is also important for donor registries to rely more on deceased donors. Professor Allen says the more living donors are relied on for organs, the greater the opportunities for illegal trade.

"In an unsupervised situation, as is the case if there’s commercialisation for example, these donors are not going to be cared for," he said.

About half of Australia’s kidney transplant patients rely on living donors.
On 9 December 2009, the Council of the NHMRC recommended that clinical trials involving animal to human transplantation (xenotransplantation) only be allowed to proceed, when appropriate regulatory and surveillance frameworks have been put in place.

What is xenotransplantation?

Xenotransplantation is the term used for the transplantation of living cells, tissues or organs from one species to another. NHMRC generally uses the term ‘animal to human transplantation’ to clarify the type of xenotransplantation being discussed (e.g. from pigs to humans).

There are three types of xenotransplantation; animal external therapies, animal cell therapies and animal organs transplants.

Animal external therapies are procedures that occur outside the body. In this type of therapy, cells or fluids are removed from the patient, cultured (grown) with or filtered through animal cells and then returned to the patient.

Animal cell therapies involve the transplantation of tissues and cells from one species to another. For example; skin, bone or clusters of specialised cells such as pancreatic islet cells (which produce insulin to treat diabetes).

Organ xenotransplants involve the transplantation of whole organs such as hearts and kidneys from one species to another. This is the most complicated type of xenotransplantation because unlike cells and tissues, organs require lots of blood vessels to supply the organ with oxygen and nutrients. Some animal devices, such as pig heart valves, have been used in humans for many years. These devices are treated so they contain no living cells. Xenotransplants differ from these devices in that they are alive and can perform the same functions as the organ, tissue or cells that they replace.

Organ xenotransplants involve the transplantation of whole organs such as hearts and kidneys from one species to another.

Are animal to human transplantation clinical trials permitted in Australia?

Not at present. On 9 December 2009, the Council of the NHMRC recommended that clinical trials involving animal to human transplantation (xenotransplantation) only be allowed to proceed, when appropriate regulatory and surveillance frameworks have been put in place.

As Australia is yet to establish robust regulatory and surveillance frameworks, clinical trials are currently not permitted.

The reasons: NHMRC assessed the risks and benefits of clinical trials with a particular focus on the scientific and technical developments in xenotransplantation research over the last five years. NHMRC concluded that the risks, if appropriately regulated, are acceptable given the potential benefits.

It is important to note NHMRC’s decision relates only to research and does not permit animal to human transplantation to be used as a routine treatment for diseases.

When will clinical trials involving animal to human transplantation be permitted in Australia?

NHMRC has recommended that clinical trials involving xenotransplantation could proceed in Australia when the following conditions are in place:

➤ The Therapeutic Goods Administration has implemented a robust framework to regulate clinical trials involving xenotransplantation
➤ An appropriate standard of oversight and monitoring is established, including for example, a surveillance strategy and a patient registry, and
➤ NHMRC has issued, using the advice of its Australian Health Ethics Committee and Animal Welfare Committee, guidance for researchers and ethics committees involved in animal to human studies.
As the processes described above will require collaboration between a range of organisations in addition to community consultation, it is difficult to propose an accurate time frame in which these processes may be complete. However, it is expected that it will take more than one year.

**Are animal to human transplantation clinical trials permitted elsewhere in the world?**

Yes. Many countries have decided to allow animal to human transplantation clinical trials. Included in this list is New Zealand, USA, Mexico, Russia, Germany, Switzerland, Malaysia, Ukraine, Sweden, France, Italy and China.

NHMRC is aware of two clinical trials involving animal to human transplantation currently underway outside Australia. One is in Russia and the other is in New Zealand. Both trials involve the transplantation of DIABECELL® into consenting patients with poorly controlled type 1 diabetes. DIABECELL® is a pancreatic product containing insulin producing (islet) cells harvested from pigs specifically bred for this purpose. The purpose of the cells is to release insulin into the patient’s body in response to elevated glucose levels. The cells are surrounded by a capsule to protect it from the patient’s immune system and prevent the patient’s body rejecting the transplant.

In other clinical trials (performed outside Australia) researchers have transplanted pig nerve cells into consenting patients for the treatment of Parkinson’s disease and Huntington’s disease, and used pig livers to filter blood while patients await a human liver transplant.

**Why is xenotransplantation being considered?**

Transplantation between members of the same species is known as allotransplantation, and in humans this is a very successful way to treat a variety of illnesses. However, few human tissues, cells or organs are available for transplantation, so that many patients who could benefit from a transplant wait in vain for a suitable donor. Transplant specialists are therefore considering animals as possible donors for human transplantation. The greatest benefit of animal to human transplantation would be a potentially unlimited supply of cells and tissues for use in humans.

Organ transplants are the most complicated type of xenotransplantation because unlike cells and tissues, organs require lots of blood vessels to supply the organ with oxygen and nutrients. Some researchers are looking at temporarily transplanting pig livers into humans who have liver failure. Some patients with liver failure need to undergo urgent liver transplants, usually within 24 to 36 hours. If a compatible human liver is not transplanted within this time, the patient may become too ill for surgery. A temporary liver transplant would keep the patient alive until a suitable human liver can be found. This procedure is known as a ‘bridging transplant’. It is unlikely that permanent animal-to-human transplantation with organs will take place for many years.

Recent advances in technology have increased the possibility of successful animal to human transplantation and stimulated research in this area. For example, genetic engineering has allowed human genes to be inserted into pigs so that their cells, tissues and organs are less likely to be rejected when transplanted into humans. More knowledge of medicine can be gained through xenotransplantation research. This knowledge can in turn improve a range of medical technologies, not just xenotransplantation.

**What sort of disease or health problems could xenotransplantation help to cure or alleviate?**

Animal to human transplantation has the potential to treat a wide range of life-threatening or debilitating conditions. For example, it is possible that isolated cells could be transplanted to treat diseases such as diabetes, Parkinson’s disease, Huntington’s disease or strokes.

Another possibility is that animal to human transplantation could be used to ‘buy time’ while potential transplant patients wait for a suitable donor. There have been promising results from overseas trials in which isolated pig liver cells were used to treat patients with acute liver failure. These cells were housed in a specially designed unit. When blood was passed through the unit, the cells filtered the blood, functioning as a liver would.

**What does xenotransplantation research involve?**

In order for xenotransplantation to become an option for human therapy, research is needed that includes:

- Animal-to-animal studies (preclinical studies) – in which proposed xenotransplantation procedures are tested on animals (e.g. pig-to-baboon kidney transplant), and
- Animal to human trials (clinical trials) – in which animal products are used for xenotransplantation procedures on human beings (e.g. pig-to-human pancreatic islet cell transplantation to treat type I diabetes).

Animal-to-animal studies are required to abide by regulations for research involving animals.

**Which animals are suitable donors for humans?**

Pigs are considered the most suitable species as a source of material for animal to human transplantation for several reasons:

- They reproduce quickly and have large litters
- Their organs are similar in size to those of humans
- They are easy to breed
- There is less risk (when compared with apes and monkeys) that they will carry diseases that can infect humans
- Their genes can be manipulated to reduce the risk of rejection from the human body.

**Have humans been transplanted with animal cells, tissue or organs?**

Yes. Outside of Australia, over 200 people have been exposed to pig cells and tissues through animal to human transplantation. Early attempts at animal to human transplantation were not very successful. Over the last few decades, researchers have gained a better understanding...
of the science and outcomes have improved significantly.

In clinical trials (performed outside Australia) researchers have transplanted pig nerve cells into consenting patients for the treatment of Parkinson’s disease and Huntington’s disease, and used pig livers to filter blood while patients await a human liver transplant. Insulin producing cells (islets), taken from the pancreas of pigs have been transplanted into consenting patients to treat type 1 diabetes.

**What are the risks of xenotransplantation to the recipient?**

Undergoing animal to human transplantation often involves surgery. Surgery is an invasive procedure and should never be perceived as an easy and risk free process. Complications may occur from the anaesthetic and risks of bleeding, infections and cardiac or breathing complications are possible.

The most significant risk to the recipient of a transplant is rejection due to the patient’s immune response. In human-to-human transplantation (allotransplantation), rejection has been largely overcome by tissue matching of donors and recipients, and by giving the recipient medicines that suppress their immune system.

The risk of rejection in animal to human transplantation is more complicated because the differences between the donor and the recipient are much greater. Two promising approaches have been developed.

One is to modify the genetic makeup of the donor animals so that the cells and tissues do not trigger such a strong immune response from the human body. Scientists have already produced several genetically modified strains of pig that show promising results. Another is to protect cells from the immune system by applying a protective coating to the cells. This technology is known as ‘encapsulation’.

Other risks include the possibility of a virus being transmitted across species. Non-human primates (apes and monkeys) are not being considered as donors for animal to human transplants because their close relationship to humans increases this risk.

**What viruses are we most concerned about in xenotransplantation?**

A number of viruses exist in animal populations and it is possible that these could be introduced into the human population through animal to human transplantation. However, research over the last 5 years has shown us that by applying strategies, the risk can be minimised significantly.

The virus that is of most concern in animal to human transplantation using pigs as the donor species is the porcine endogenous retrovirus (PERV). PERV is present in most strains of pigs and cannot be removed by raising pigs in sterile conditions. PERV is harmless in pigs, but some laboratory research suggests it is possible that PERV could cause disease in humans through animal to human transplantation. The risk can be minimised by using pigs that do not carry the strain. More than 150 people worldwide who have been transplanted with pig tissue or had their blood pass through pig cells have shown no evidence of infection with a virus or any other infectious agent originating from pigs.

**Are there any risks of xenotransplantation to the wider community?**

Animal to human transplantation carries some risk for the wider community, although it is believed the risk is very small. The concern for public health is that xenotransplantation might transmit an infectious agent (such as a virus) from animals to humans causing disease. The new disease could also spread to those in close contact with the transplant recipient and the wider community.

The knowledge driving this concern is many past examples of retroviruses moving from one species to another. Retroviruses do not always cause obvious signs of disease immediately. Therefore, if a retrovirus in a xenotransplant were to infect the recipient of the transplant, it may spread to close contacts, carers and even the general population before it became obvious that an infection had occurred.

**What steps would be taken to minimise the risks from xenotransplantation?**

If animal to human trial were allowed in Australia, animals would be bred in compliance with strict policies and testing the donor tissue for bacteria, viruses and disease would be mandatory.

Although most pigs carry PERV, there are strains of pigs that do not carry the virus. Researchers are likely to use these strains (or breed others) for animal to human transplantation to further reduce the risk of infection in the recipient.

Animal to human trials will not be permitted unless there is an appropriate infection control policy in the hospital where the transplant is taking place, to prevent transmission of infections from the xenotransplant recipient to hospital contacts. In addition, because the long-term consequences of xenotransplantation will not be fully understood for some years, anyone transplanted with cells, tissues or organs from another species will need to be carefully monitored. Therefore, anyone receiving a transplant would be informed about the potential infectious disease risks to themselves and their close contacts and asked to support such long-term monitoring.

**Who would be responsible for controlling xenotransplantation trials in Australia?**

In Australia, permission must be sought from the Therapeutic Goods Administration before a clinical trial can commence. Trials involving new medical technologies undergo strict assessment and researchers need to demonstrate the potential benefit of the therapy outweighs the risk. Clinical trials also undergo ethical assessment by a committee of experts.
To say that there is room for improvement in current treatments for type-1 diabetes is an understatement.

The chronic illness affects about 150,000 Australians, with those at the more severe end at risk of blindness, vascular problems and potential amputation of limbs, says Professor Philip O’Connell, director of transplantation at Sydney’s Westmead Hospital.

Implanting insulin-producing islet cells from pigs into the pancreas could allow people with severe type-1 diabetes to start producing their own insulin in response to fluctuating blood glucose levels, O’Connell says.

While this procedure could reduce, or even eradicate, reliance on insulin injections, O’Connell says it would only be suitable for people with very severe diabetes where the benefits outweigh the health risks of suppressing the body’s immune system to ensure the tissue isn’t rejected.

Donor recipients face a lifetime on immunosuppressant drugs to prevent their bodies rejecting the foreign tissue, and as a result, increase their risk of getting cancer or infections.

It is still some years before the technique may be available to people with severe type-1 diabetes, but it is a step closer since a ban on experimental research in humans was recently lifted in Australia.

From the 1960s, surgeons made various attempts to transplant primate organs into people only to see patients die after hearts or kidneys were rejected by their immune systems.

However, not everyone is convinced the benefits of transplanting animal tissue to humans – xenotransplantation – outweigh the risks enough for human trials to go ahead.

What is xenotransplantation?

Xenotransplantation is the implanting of live animal organs, tissues or cells into a human patient. The term also covers some procedures that happen outside the patient’s body, such as external filtering of blood through a pig liver in a patient with liver failure. It does not include the use of dead tissues derived from animals, such as porcine or bovine heart valves.

Current research mainly focuses on transplantation of individual cells or tissues, particularly in the brain and pancreas, although some scientists believe successful transplantation of whole organs could become a reality in the future.

Xenotransplantation is not a new idea. From the 1960s, surgeons made various attempts to transplant primate organs into people only to see patients die after hearts or kidneys were rejected by their immune systems.

The science has moved on since then. It is used for treating severe burns – human skin cells are cultured using animal feeder layers, harvested, then grafted onto the patient’s wound to assist healing.

But tissue rejection issues and concerns about the potential for cross-species contamination continue to be major stumbling blocks.

In 2004, Australia’s National Health and Medical Research Council (NHMRC) banned human trials of xenotransplantation procedures (with the exception of skin grafts) due to concerns about the risk of viruses called porcine endogenous retroviruses (PERVs for short) being transmitted to humans, particularly people with weakened immune systems.

But in late 2009, the NHMRC gave the go ahead for human trials to proceed under strict conditions, including that xenotransplantation should not be used for routine treatment of diseases. After reviewing the scientific evidence, the council concluded that “the safety and efficacy of xenotransplantation technologies has progressed significantly over the last four years.”

So what is the current science underpinning xenotransplantation?
DESIGNING DONOR ANIMALS

A better understanding of what causes our body to reject foreign tissue, combined with our growing ability to manipulate the genome, has opened up the possibility of creating animals specifically designed to provide an unlimited supply of materials for human patients.

O’Connell is part of a large three-state research collaboration that is genetically engineering pigs to minimise the twin risks of tissue rejection and disease transmission.

“Somehow people think we are growing human arms out of the backs of pigs,” O’Connell says. “Really, we are just looking at five or six genes. The pig still looks like a pig and behaves like a pig. We are not creating a monster.”

Pigs are now considered the donor animals of choice because they are physiologically similar to humans, but are distant enough from us in evolutionary terms that the two species do not share a lot of pathogens.

Pigs are now considered the donor animals of choice because they are physiologically similar to humans ...

Because they have large litters and mature relatively quickly, it is also practical to breed them in the quantities required for human transplantation.

A single gene that is active in pigs, but not in humans, is responsible for 95 per cent of the antibodies we produce when exposed to pig tissue, O’Connell says.

Deactivating the gal-transferase gene in donor pigs, and perhaps adding a few human genes involved in regulating immune response, might reduce risk of rejection, allowing tissue recipients to receive much lower doses of immunosuppression drugs.

The amount of immunosuppression drugs needed could be further reduced in the future, if islet cells could be designed to secrete their own immunosuppression within a local area, says O’Connell.

O’Connell and his colleagues have also been collaborating with professor of animal genetics Chris Moran from the University of Sydney.

Using traditional breeding methods rather than genetic engineering, Moran’s team has created a herd of pigs that does not carry the porcine virus considered most likely to be transmissible to humans.

One of a trio of PERVs, the viral type known as PERV C has been shown to be capable of recombining with the more common PERV A to generate a form that can infect human cells in the laboratory, although nobody knows whether it would actually cause illness inside the human body.

Although the risk of the recombined virus causing disease in humans might be low, Moran says, “the principle would be to be cautious.”

His inbred pigs – so similar genetically that they are effectively clones – are designed to reduce that risk because they do not carry PERV C, making them invaluable for research now and a potential source of transplant material in the future.

A RISKY BUSINESS?

Xenotransplantation is not without its critics. Animal rights activists, and some doctors are concerned about the ethics and potential risks of the practice.

“I personally think this risk isn’t worth taking,” says infectious diseases physician Professor Peter Collignon. “If you look at all the major disease outbreaks in history, it has been a virus that has jumped from animals to humans – and that’s everything from HIV, to measles, to flu.”

PERVs may not be the only porcine viruses that pose a potential risk, Collignon says.

“Pigs probably have a whole lot of viruses. In my mind, there’s no doubt that if we do this we will be putting viruses – or viral genome – that we don’t even know exist into people.”

Infection risk is aggravated in xenotransplantation, Collignon says, because tissue recipients’ immune systems are suppressed by anti-rejection drugs.

“It’s one thing if the person themselves succumbs to that, but there’s a public health issue if that person becomes a vehicle for spreading it.”

Collignon also questions the likely benefits of such procedures, suggesting there could be other ways of achieving the same aims, such as improving organ donation rates, or even transplants from human cadavers.

O’Connell and Moran, however, say there is a very large body of research showing the risk of transmitting disease to humans is very low and the potential benefits of such techniques are huge.

“The risks seem very, very small and manageable and it’s reasonable to go ahead and do clinical trials where people are monitored closely”

“Somehow people think we are growing human arms out of the backs of pigs,” O’Connell says. “Really, we are just looking at five or six genes. The pig still looks like a pig and behaves like a pig. We are not creating a monster.”

Pigs are now considered the donor animals of choice because they are physiologically similar to humans ...
EXPLORING ISSUES

ABOUT THIS SECTION

‘Exploring issues’ features a range of ready-to-use worksheets relating to the articles and issues raised in this book.

The activities and exercises in these worksheets are suitable for use by students at middle secondary school level and beyond.

As the information in this book is gathered from a number of different sources, readers are prompted to consider the origin of the text and to critically evaluate the questions presented.

Does the source have a particular bias or agenda? Are you being presented with facts or opinions? Do you agree with the writer?

The types of ‘Exploring issues’ questions posed in each Issues in Society title differ according to their relevance to the topic at hand.

‘Exploring issues’ sections in each Issues in Society title may include any combination of the following worksheets: Brainstorm, Research activities, Written activities, Discussion activities, Quotes of note, Ethical dilemmas, Cartoon comments, Pros and cons, Case studies, Design activities, Statistics and spin, and Multiple choice.

CONTENTS

BRAINSTORM 49
WRITTEN ACTIVITIES 50
RESEARCH ACTIVITIES 51
DISCUSSION ACTIVITIES 52
QUOTES OF NOTE 53
CARTOON COMMENTS 54-55
MULTIPLE CHOICE 56
BRAINSTORM

Brainstorm, individually or as a group, to find out what you know about organ and tissue donation.

1. Why do people need organ and tissue transplants?

2. Explain organ and tissue donation after death.

3. List the 5 organs and 4 types of tissue that can be donated after death.

4. Explain living donation (while you are alive).

5. List the 5 organs and tissues that can be donated while you are alive.
1. Explain what an ‘opt-out’ donor system is.

2. What objections might people have to donating their loved one’s organs?
1. What standards are applied to determine if a potential donor’s organs are suitable to transplant?

________________________________________________________________________________________________________

________________________________________________________________________________________________________

________________________________________________________________________________________________________

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________________________________________________________________________________________________________

2. What are the current limitations regarding the use of animal organs in human beings?

________________________________________________________________________________________________________

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________________________________________________________________________________________________________

________________________________________________________________________________________________________
1. Allocation of organs is a complex process that depends on a range of factors including medical need, urgency and the capacity of the recipient to benefit. In Australia, allocation systems are underpinned by the principles of utility, equity and fairness. Discuss the criteria used in considering potential organ transplant recipients.

2. One of the reasons for Australia’s donor shortage is the many myths and misconceptions clouding the topic, particularly among those who have not personally encountered recipients or family members of donors. Rumours, myths and misunderstandings about organ donation and transplantation are widespread. Provides 5 examples of common myths about organ donation/transplantation and explain the reality.
You may wish to consider the following statements together in pairs, or use them as starting points for group discussions.

1. Not everyone with end stage organ failure is suitable to receive a transplant – potential recipients are evaluated extensively and only those for whom transplantation is likely to be successful are considered. (Transplant Australia, p.1)
   Discuss the criteria.

2. In Australia, a person has a 10 times greater chance of requiring an organ or tissue transplant than of becoming a donor. Organ donation is medically possible in less than 1 per cent of all deaths that occur. (Transplant Australia, p.1)
   Why might this be the case?

3. It is important to discuss your decision with your family, partner or close friends. By registering your decision on the Australian Organ Donor Register, you will ease the burden on your family of having to make this decision on your behalf. (Department of Health and Ageing, p.6)
   What negative considerations may confront a grieving family?

4. “If I’m in an accident and the hospital knows I want to be a donor, the doctors won’t try to save my life!” (Transplant Australia, p.10)
   Discuss this concern in relation to medical ethics.

5. The way in which a person dies will generally determine what they are able to donate. In most cases, organs (heart, lungs, liver, pancreas and kidneys) can only be donated if a person has died in an intensive care unit under special circumstances. Less than 1 per cent of all people who die in hospital each year die this way. (Department of Health and Ageing, p.12)
   What are the practical considerations for the timing and circumstances of organ harvesting?

6. Organ donation does not take away the pain of death. However, many donor families have said that the transplant was the only positive thing to come from the death of their relative. (GriefLink, p.20)
   What are the possible positive considerations for a grieving family by consenting to the donation of their loved one’s organs and tissues?

7. Arguments for an opt-out system are often based upon utilitarian analyses where the goal is to obtain a better outcome, whereas an opt-in system is more closely aligned with the ‘in principle’ view that consent in such matters must be obtained. (Southern Cross Bioethics Institute, p.24)
   Discuss the practical and ethical differences between an opt-in (presumed consent) and an opt-out system of donation.

8. People should be offered the choice to donate their organs before they have died. And those wishes must be respected. After all, they are the altruistic ones who are prepared to do what they should do. It would fail to respect their autonomy and wishes if we did not take their organs, if they had explicitly requested it. (Julian Savulescu and Dominic Wilkinson, p.34)
   Discuss.

9. The ethical issues that arise in donation after cardiac death are many, but essentially boil down to the question of whether it is morally reasonable to withdraw treatment from a non-brain dead person who has no feasible chance of recovery in order to use their organs to benefit others. Significant ethical debate has ensued around this issue, and there continue to be arguments at transplant conferences about the ethics of the decision. But while Australia’s donation rates remain as low as they are then it seems safest to be guided by John Stuart Mills’s utilitarian ideal, “the greatest good for the greatest number.” (Dr Chris Merry, p.36)
   Discuss.

10. There are also organ ‘black markets’, where people in developing countries sell their organs to foreigners who want to bypass the waiting list in their own country. This takes advantage of donors, many of whom are poor and helpless. Because there may not be a full assessment before donation, it can lead to serious health problems for both donors and recipients (e.g. the person receiving the transplant becoming infected with a disease from the donor). (National Health and Medical Research Council, p.39)
    Could the regulated sale of organs in Australia be a positive solution to the organ shortage?
Refer to the numbered diagram below and identify each of the organs and tissues represented by a number.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9.
CARTOON COMMENTS

Refer to the identified organs and tissues on the diagram on the previous page and write a brief description of each one. Provide a donation or transplant fact for each organ and tissue.

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9.
Complete the following multiple choice questionnaire by circling or matching your preferred responses. The answers are at the bottom of the page.

1. Which of the following organs can be transplanted:
   a. Pancreas
   b. Kidney
   c. Intestine
   d. Lung
   e. Thyroid
   f. Heart
   g. Stomach

2. Which of the following tissues can be transplanted:
   a. Musculoskeletal
   b. Blood vessel
   c. Heart valve
   d. Skin
   e. Cornea

3. Respond to the following statements by circling either ‘true’ or ‘false’:
   a. You must be 18 or over to register your legal consent to become an organ donor
   b. Organ donation is against the beliefs of most major religions
   c. Being over a certain age disqualifies you from donating organs
   d. People can recover from brain death
   e. Registering on my driver’s licence places me onto the Australian Organ Donor Register
   f. Doctors won’t work as hard to save my life if they know I am a donor
   g. Australia has one of the highest transplantation success rates in the world
   h. People can wait an average of 1-3 years for a life-saving transplant in Australia
   i. I need to tell my family my wishes even if I have already registered to be a donor
   j. People only need organs because of bad lifestyle choices
   k. My family does not need to consent to my organs being donated if I have registered
   l. Australia currently has an ‘opt-out’ system for organ donation based on presumed consent
   m. Organ donation is possible after brain death, in some cases
   n. The care of patients is compromised by the need to preserve their organs
   o. The two ways in which death is defined are brain death and cardiac death
   p. Living donation in Australia must be altruistic and not involve payment
   q. Animal to human organ transplantation trials are currently occurring in Australia

MULTIPLE CHOICE ANSWERS
1 = a, b, c, d, f ; 2 = a, b, c, d, e ; 3 – a = T, b = F , c = F , d = F , e = F , f = F , g = T, h = T, i = T, j = F , k = F , l = F , m = T, n = F , o = T, p = T, q = F.
Issues in Society | Volume 333

Organ and Tissue Donation

★ Around 40% of families in Australia do not give consent. (p.1)
★ On average, people on the transplant list must wait between 6 months and 4 years. (p.18)
★ There are about 20 million spare kidneys in Australia – one for each man, woman and child. (p.40)
★ In the UK, 1,000 people per year die on the transplant waiting list. In the US, 18 patients per day die waiting. (p.34)
★ People aged less than 18 years can become organ and tissue donors, although consent will need to be obtained from a family member at the time of death. (p.6)
★ There’s no defined cut-off age for donating organs. Organs have been successfully transplanted from donors in their 70s and 80s. (p.10)
★ Kidney transplant survival rates are about 90% in the first year and over 75% in 5 years. (p.3)
★ Patient survival rates for heart and liver transplantation are 90% in the first year and 85% after 5 years. (p.3)
★ Australia’s first successful heart/lung transplant was in 1986, at St Vincent’s Hospital, NSW. (p.4)
★ Three quarters of patients (76%) on the organ transplant waiting lists are between 40 and 69 years old – 164 patients under the age of 30 years are on the list, 29% are children or teenagers (under 18). (p.7)
★ The 2010 organ donation total of 309 donations, equates to a national organ donor rate of 13.8 per million. (p.8)
★ There are more than 10,000 people in Australia who are on dialysis. The majority would benefit from a transplant. (p.19)
★ Spain has the highest rate of organ donation in the world (2.5 times higher than the UK). (p.25)
★ In 1983, the Muslim Religious Council initially rejected organ donation by followers of Islam, but it has reversed its position, provided donors consent in writing prior to death. (p.28)
★ Organ donation is often considered unacceptable by the Shinto religion as families are concerned that they not injure the itai – the relationship between the dead person and the bereaved people. (p.29)
★ Brain death criteria were proposed in 1968 by a Harvard Medical School Committee. (p.32)
★ In Australia, 9,000 people are alive on dialysis and only about 5 per cent of patients are offered a kidney transplant in any year. The average waiting time for a transplant is four years. About one patient a week dies waiting for a kidney. The cost of dialysis is over $500 million per year. (p.40)
★ The number of commercial transplants globally has dropped from about 10,000 to 2,000 in the past few years, creating an enormous demand for organs. (p.42)
★ Some animal devices, such as pig heart valves, have been used in humans for many years. (p.43)
★ Many countries have decided to allow animal to human transplantation clinical trials including New Zealand, USA, Mexico, Russia, Germany, Switzerland, Malaysia, Ukraine, Sweden, France, Italy and China. (p.44)
★ Outside of Australia, over 200 people have been exposed to pig cells and tissues through animal to human transplantation. (p.44)
★ Implanting insulin-producing islet cells from pigs into the pancreas could allow people with severe type-1 diabetes to start producing their own insulin in response to fluctuating blood glucose levels. (p.46)
★ Pigs are now considered the donor animals of choice because they are physiologically similar to humans. (p.47)
★ A single gene that is active in pigs, but not in humans, is responsible for 95% of the antibodies we produce when exposed to pig tissue. (p.47)

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**Allotransplantation**
The transplantation of cells, tissues and organs between individuals of the same species. Most human tissue and organ transplants are allografts.

**Animal-to-animal transplants**
Animal-to-animal studies are preclinical xenotransplantation research studies in which organs, cells or tissues are transferred from one animal species (e.g. pig) to another (e.g. baboon). Animal-to-animal studies are required to abide by regulations for research involving animals.

**Antigens**
Antigens are substances which are capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of that response, that is, with specific antibodies or specifically sensitised T-lymphocytes.

**Australian Organ Donor Register**
The national organ and tissue donor register for transplantation. It enables people to record their decision on becoming an organ and tissue donor. It can be accessed by authorised medical personnel, who have signed confidentiality agreements, anywhere in Australia 7 days a week, 24 hours a day. In the event or your death, information about your wish can be obtained from the Donor Register and provided to your family. The Australian Organ Donor Register is not for the purpose of recording decisions about donating organ and tissue for scientific research purposes, or for the manufacture of biological medical products.

**Brain death**
The cessation of the brain’s function forever. A number of tests are used to determine whether you are in a coma (you are unconscious, but the brain may heal) or if your brain has irreversibly stopped working. Two senior doctors not involved in transplantation will carry out these tests.

**Cardiac death**
When the heart stops forever and blood stops circulating through your body.

**Coma**
A patient in a coma is unconscious because their brain is injured in some way, although their brain continues to function and may heal. Available medical tests can clearly show the difference between brain death and coma.

**Donation**
Donation can involve organs including kidneys, heart, lungs, liver and pancreas; and tissues including heart valves, bone tissue, skin tissue and eye tissue. There are two ways people can donate: organ and tissue donation after death, and living donation (while you are alive).

**Fibroblasts**
Fibroblasts are connective tissue cells which differentiate into chondroblasts, collagenoblasts and osteoblasts.

**Immunological response**
Immunological response is the mechanism for distinguishing ‘self’ from ‘non-self’ and eliminating invading microorganisms or other foreign materials from the body. In xenotransplantation, it can lead to rejection of the transplanted organ, tissue or cells.

**Immunosuppressive drug therapy**
Prevents or reduces immune response via the administration of drugs. Immunosuppressive drugs are required after an organ is transplanted from another individual to prevent rejection of the organ.

**Opt-out organ donation system**
In an opt-out system the wishes of people are unknown yet doctors assume that, unless there is a formal indication otherwise, people want to donate their organs. Therefore, the system is one of presumed ownership of the deceased body by the impersonal state unless otherwise indicated.

**Organ harvesting**
Refers to the removal, preservation and use of human organs and tissue from the bodies of the recently deceased to be used in surgical transplants on the living.

**Stem cell therapy**
Manipulating stem cells from a patient may allow doctors to grow human cells, bone marrow, tissue or perhaps whole organs for use in transplants, removing the risk of rejection.

**Transplantation**
Surgical techniques are being perfected to graft replacement blood vessels, heart valves, artificial joints and donated human organs, including body parts such as arms.

**Xenotransplantation**
The term used for the transplantation of living cells, tissues or organs from one species to another. Xenotransplantation involves the use of animal organs that may have been engineered to contain human genes to prevent rejection. Xenotransplantation is controversial as there are ethical concerns to be addressed about growing animals solely to be used as replacement parts, and concerns about the transmission of new viruses across species. There are three types of xenotransplantation; animal external therapies, animal cell therapies and animal organs transplants.

**Zoonotic**
Pertains to an animal disease which is transmissible to humans.
Websites with further information on the topic

Australian Bone Marrow Registry  www.abmdr.org.au
Better Health Channel  www.betterhealth.vic.gov.au
Department of Health and Ageing  www.health.gov.au
DonateLife  www.donatelife.gov.au
Gift of Life  www.giftoflife.asn.au
Kidney Health Australia  www.kidney.org.au
National Health and Medical Research Council  www.nhmrc.gov.au
Transplant Australia  www.transplant.org.au
Transplantation Society of Australia and New Zealand  www.tsanz.com.au
Zaidee’s Rainbow Foundation  http://zaidee.org

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## Index

### A
- allotransplantation 44-45
- animal therapies 43
- transplants 43
- ante-mortem procedures 30
- Australian Organ Donor Register 6, 11, 14, 16, 17, 18, 22, 31, 35

### B
- biliary atresia 1-2, 15
- black market 26, 39 see also illegal organ trading
- blood 3, 11, 13
- bone marrow 3, 12, 38, 41
tissue 1, 3, 7, 12

### C
- cardiomyopathy 1, 2, 15
- cirrhosis 2
- code of ethics 16
- coma 10, 12, 15, 31, 35, 37
- cord blood 3, 12
corneal transplant 1, 2, 4, 7, 9, 12, 15
- coronary artery disease 2
cyclosporine 4
- cystic fibrosis 1, 15

### D
- dead donor rule 23, 32, 33, 34
death
  - brain 10, 11, 12, 15, 16, 20, 28, 30, 31, 35, 37
  - cardiac 15, 26, 31, 32, 34
diabetes 2, 44, 45, 46
- donation
  - age limits 6, 10, 12, 14
  - compulsory 21
discussing your decision 6, 14, 17, 18, 19, 20, 22, 31, 35
donation after cardiac death 12, 37
guidelines 35
- living donation 3, 19, 26, 33, 35-39, 42
  - making the decision 13, 16, 17, 39
  - myths/misconceptions 9-11, 14-15
  - opt-in system 19, 23, 24, 25, 36
  - opt-out system 19, 21, 22, 23, 24, 25, 32, 36
  - paired 39
  - rates of 18, 22, 25, 30, 36, 37
  - registering 6, 16, 21, 22, 25, 30
    see also Australian Organ Donor Register
donor coordinator 10, 14, 37
donor shortages 9, 46
driver’s licence 6, 11, 17, 19, 36

### E
- ethics 16, 21-47
- eyes see corneal transplant

### F
- face transplant 5, 26
- funerals, open-casket 9, 14

### G
- glomerulonephritis 2
- haematology 13
- hand transplant 5
- harvesting, organs 26, 42
- heart 1, 7, 12, 14, 15, 18, 32
  - transplant 2, 3, 4, 33
  - valves 1, 2, 7, 12, 14, 15
- heart/lung transplant 4, 18, 36
- history, organ/tissue transplantation 4, 8

### H
- haematology 13
- illegal organ trading 10, 42 see also black market
- immunosuppressant drugs 11, 46, 47
- intestinal transplant 4, 18
- kidneys 1, 3, 7, 12, 14, 18, 32, 36, 38, 39, 41
dialysis 2, 19, 40, 42
disease, inflammatory 2
failure 1, 2, 40
function 19
- transplant 2, 3, 4, 7, 18, 19, 40, 41, 42

### I
- ileum 1
- illegal organ trading 10, 42 see also black market
- immunosuppressant drugs 11, 46, 47
- intestinal transplant 4, 18

### K
- kidneys 1, 3, 7, 12, 14, 18, 32, 36, 38, 39, 41
dialysis 2, 19, 40, 42
disease, inflammatory 2
failure 1, 2, 40
function 19
- transplant 2, 3, 4, 7, 18, 19, 40, 41, 42

### L
- leukaemia 3
- life support 25, 26, 30, 33, 34
- liver 1, 7, 12, 14, 15, 18, 32, 38
  - transplantation 1, 2, 3, 4, 44, 45
- liver-bowel transplant 4
- lungs 1, 2, 4, 7, 12, 14, 15, 18, 32
- lymphomas 3

### M
- medical research 13, 15

### N
- nephrectomy 5
- nephropathy 2

### O
- organ
  - donation 1, 6, 7, 8, 12, 14, 18, 25
    - rates of 8, 12, 19, 21, 34
    - requests for 20
    - transplants 1, 7

### P
- pancreas 1, 4, 7, 12, 14
- islet cells 2, 18, 43, 44, 46, 47
- transplantation 2, 4, 18
- pig
  - heart valves 43
  - livers 44, 45, 46
  - nerve cells 44, 45
  - porcine endogenous retrovirus (PERV) 45, 46-47
  - polycystic disease 2
  - prison inmates 26, 42

### R
- religious views 9, 14, 16-17, 27-29
- renal see kidneys

### S
- skin 3, 7, 9, 12, 14
- Spain 19, 22, 23, 25
- stem cells 3, 12
- success rates 3, 12, 18, 22

### T
- tissue 1, 11, 12, 14
  - donation 7, 8, 12, 15
  - musculoskeletal 3, 7, 14
  - transplantation 3, 7, 12
- ventilator 20, 33, 35, 37
- virology 13

### V
- waiting lists 3, 7, 8, 15, 16, 18, 22, 23, 26, 36, 39, 46
- xenotransplantation 4, 43-45, 46-47