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The Facts about donation

ORGAN DONATION: DEATH AND DONATION

Death conjures up many thoughts and emotions for us. When we think of someone who has died we usually think of someone who is no longer breathing or moving, whose heart has stopped beating. This is how most people understand death. There are two ways by which death can be confirmed: cardiac death and brain death.

Cardiac Death:

Most people know and are familiar with cardiac death, that is, when the heart stops beating. When this occurs and there is no longer a pump (the heart) to circulate blood and oxygen to the brain and other organs of the body – the person has died.

Brain Death:

Brain death occurs when the brain is unable to receive blood and oxygen because of a severe injury, such as trauma or cerebral bleed, but the heart is still beating because the person has been medically cared for on mechanical ventilation.

The ventilator is a mechanical device that pushes oxygen into the lungs. The heart does not rely on the brain to control its beat - it has its own natural inbuilt pacemaker. It must, however, have oxygen to continue beating and this is provided by the mechanical ventilator. So, even though the heart is still beating and the other organs may be working, when the brain has died, the person is dead. They can never recover. A person who has died under these circumstances, on a ventilator, will look very different to the person who has died of cardiac death. They will have colour, be warm and look like they are asleep.

Brain death can only be diagnosed in the Intensive Care Unit when someone is being supported on a

COMA – WHAT DOES IT MEAN?

Coma and brain death are **not** the same thing. When someone is in a coma, they are in a deeply unconscious state from which they may or may not recover. The brain continues to function when someone is unconscious because it can still be supplied with blood and oxygen.

WHAT CAUSES THE BRAIN TO DIE?

Death of the brain is caused by a serious brain injury. There are many situations which may cause the brain to be so badly injured that it dies. There are three main groups;

1. Trauma affecting the head such as: motor vehicle accidents or other trauma where a fatal injury has damaged the head and caused the brain to swell..
2. Cerebral haemorrhage: bleeding within the brain e.g. This is usually commonly referred to as a type of stroke but it is different from the usual stroke. For example a cerebral haemorrhage can be caused from a weakened blood vessel walls or head trauma,
3. Oxygen deprivation : drowning, asthma, asphyxiation

Like any part of the body, when the brain is injured it will swell. But unlike a finger or your ankle that can swell without restriction, the brain is confined within the skull. It is limited as to how far it can expand so

when the brain is damaged and swells, it squashes the vessels that supply it with blood, causing permanent damage by stopping the flow of blood and oxygen. This causes the brain cells to die and, unlike other cells within the body, brain cells cannot re-grow or recover. Finally, this increased pressure pushes down on the brain stem, where the spinal cord and the brain join at the back of the neck. It controls some of

the body's vital functions like blood pressure, heart rate, coughing, swallowing, temperature and breathing. The pressure on the brainstem keeps it from performing vital functions necessary for life.

A person who is brain dead has no brain or brain stem function. They cannot feel, cough or swallow. They will never breathe of their own accord. They no longer feel pain or emotion. They are dead.

HOW CAN THE DOCTOR TELL WHEN A PERSON'S BRAIN HAS DIED?

Critically ill people are under constant care and supervision in the intensive care unit. Sometimes it becomes clear that a brain injury is so extreme that survival is not possible. The medical staff will begin to notice certain changes in the person's condition that indicate severe damage and/or death of the brain. These may include changes in pupil reaction, heart rate, blood pressure and body temperature. These changes, together with the loss of other basic responses like coughing and breathing, cause doctors to suspect that brain death has occurred as it is the brain that controls all of these mechanisms.

In order for a doctor to confirm that a person has died there are a number of tests that can easily be performed to assess brain function. Doctors can assess the basic reflexes that the brain controls by applying a stimulus and observing for a reaction. Even people in a deep coma will respond in some way to the stimulus. Someone whose brain has died will show NO RESPONSE to any stimulus. The brain reflexes are assessed a second time by a different doctor and the two must concur that **there is no response to any of these** for a person to be declared dead according to brain death criteria. A death certificate can then be issued.

No person fulfilling this criterion described for brain death has ever developed brain function or recovered.

Sometimes these reflexes cannot be properly examined due to an injury to the face or spine. In these cases, a special x-ray called a cerebral angiogram or a cerebral perfusion scan may be performed. These special x-rays will show if there is any blood flow to the brain.

WHEN CAN A PERSON DONATE?

Donation can only take place after death has been certified, that is, when the person has died in the Intensive Care Unit and declared brain dead or when the heart has stopped beating.

Donation after brain death – Organ Donation

Donation may only be considered after the person has been declared dead.

Organs such as the heart, liver, kidneys and pancreas have the best chance of successful transplantation when they have a constant supply of blood and oxygen. A ventilator supplies the necessary oxygen to those organs, enabling them to keep functioning and allows a window of time for the co-ordination of the donation process.

Donation after cardiac death - Tissue donation

When someone dies after diagnosis of cardiac death, they can only donate tissues for transplantation as most tissues do not require a constant blood supply to be successfully transplanted. More people will die as a result of cardiac death than brain death. Tissues which can possibly be donated are eye tissue, heart tissue, bone tissue and skin.

WHAT IS THE PROCESS OF DONATION?

When a patient dies in a way that makes them suitable to donate organs or tissues, the Australian Organ Donor Register is checked to see whether the person had registered consent or objection. To protect confidentiality, this can only be carried out by authorised medical personnel, in most cases a donor coordinator.

Whether the person has registered or not, families are involved in the process. Family members will be asked:

- Whether there are circumstances that the person would have wanted taken into account;
- Whether the person may have had a change of mind since registering.

If there is no written or verbal objection to donation or the person had not registered, the family will be given information about the process and asked whether they agree to donation.

Donation will not go ahead without the family's agreement.

- If the family agrees, the next of kin will be asked to give consent, which will be recorded. As part of the consent process, he or she will also be asked which organs and tissues may be removed for transplantation.
- Throughout this process, the family will be supported by experienced staff members who are trained to answer any questions they have, regardless if they agree or not.

If donation goes ahead

If donation is agreed to, a number of things happen, some medical and some related to paperwork.

The designated officer in a hospital (or the medical supervisor in a tissue bank) makes sure the process meets legal and ethical requirements. Care is taken to make sure the family is looked after.

There are also some things that happen for the benefit of transplant recipients:

- A medical assessment will be made to determine regarding donor's health and lifestyle to ensure the safety of transplanted organs and tissues and prevent transmission of disease;
- Blood tests are performed;
- The donor continues to receive all the care necessary to preserve organ function;
- With family consent, an autopsy may be carried out to make sure the donor had no conditions (such as cancer) that could affect the health of the recipient.

How are the organs and tissues removed?

The operation to remove organs and tissues is performed by experienced medical transplant surgeons, with the care and precision of any other operation. The person's body is treated with the same respect and dignity given to a living person, the wound is carefully and neatly closed as any normal surgical procedure, and the body maintains a normal appearance.

After the operation

All families are offered the opportunity to be with family member immediately after organ donation surgery and spend more time with them. Organ or tissue does not prevent a viewing at the funeral home or an open coffin at the funeral.

THE HOSPITAL PROCESS

How long is the time between death and donation?

Organ donation can take many hours to organise. Nationally, the average time between death and donation is around 11 hours. Various factors influence this time but the major factors are the needs of the donor family, where the donor is geographically located, finding suitable recipients, and the activity of the donor hospital operating theatres.

What happens during this time?

The donor always remains at the hospital where they have died. During this time, information about the donor is collated from their medical record and from an interview with the next of kin (family). Blood is also collected from the donor for disease screening. This is to ensure no transmissible diseases are passed on to the recipient through transplantation. Procedures such as ECGs and chest x-rays may need to be performed. All of this information is used to carefully select the most suitable transplant recipients for the donated organs.

Once the legal requirements are taken care of in relation to consent and the information about the donor is collected, the Donor Coordinator offers the organs and tissues to the doctors caring for the people requiring transplantation. Recipient location, and therefore where the surgical retrieval teams need to come from, influences the timeframe.

The donor's family and friends are offered the opportunity to spend time with their loved one at the bedside while donation is being organised. Some families choose to leave the hospital and come back just before their loved one is going to the operating theatre to say their goodbyes. Other families prefer to say their goodbyes and not wait or come back at all. Families and friends are encouraged to do whatever is right for them, collectively or individually. The hospital staff and the Donor Coordinator provide support for the donor family. Donor Coordinators liaise with family via the Intensive Care Unit (ICU) staff to keep them informed of what time the retrieval will take place.

Who is involved and what do they do?

There are several people involved in the organ and tissue donation and transplantation process.

Donor Coordinator

The person, who coordinates the donation, provides information and support to the donor family.

Intensivist

A doctor who specialises in the practice of intensive care medicine.

Designated Officer

The Medical Superintendent or other responsible person appointed by hospitals under their state legislation. Once satisfied with the consents obtained, and having made reasonable inquiries that the deceased had not, during their lifetime, expressed an objection to the removal after death of their tissue, the designated officer may authorise the removal of the tissue.

Police

Will attend the ICU in coroner's cases to identify the body of the deceased with the next of kin if the person has died where a coronial investigation is warranted, eg, a motor vehicle accident or assault.

Coroner

Investigates the circumstances of unnatural deaths and reports the cause. The Coroner must give consent for organ/tissue donation to occur and can impose restrictions on what can be donated.

Social Worker

Provides support to the family and assistance with practical issues.

Recipient Coordinator

The person who coordinates the transplant operation, provides information and support to the transplant recipient and their family. The recipient is usually being prepared for their operation at the same time the donor operation is occurring.

Transplant Physicians

The doctors who care for the patient with end stage organ failure and who decide who the most suitable transplant recipient is. They are not involved in any way with donation.

Donor/Transplant Surgeons

The doctors who perform the organ retrieval surgery and the transplant operation.

The donation operation

The operation performed to retrieve the donated organs is carried out in the same way as any other operation. It is performed under sterile conditions in operating theatres by some of Australia's leading surgeons. The length of the incision and the time it takes are determined by what organs will be retrieved. On average however, the operation takes about four hours. The organs are removed extremely carefully to prevent damage and to maximise their chance of working when transplanted.

The donor is always treated with the utmost care and respect, with their dignity maintained at all times. The Donor Coordinator, whose role is to care for the donor, is always present in the operating theatre. Donation of organs and tissues does not affect the appearance of the donor. When heart and/or lungs have been donated, the shape of the chest is maintained by the ribcage. Likewise, the shape of the abdomen is unchanged after liver and kidney donation.

The wound is sutured (stitched) closed and dressed like any other surgical incision.

The family is invited to view the body of their loved one following the surgery.

Who decides who is transplanted?

Organ Allocation & Matching (heart, lungs, liver, pancreas, kidneys)

Ethnicity, gender, financial, social, celebrity or political status does not affect the allocation of organs. There is no black market trade of organs in Australia. Organs are given to the person with the greatest medical need who has the best chance of successful transplantation.

People waiting for organs other than kidneys are listed at the transplant centre in the state where they will have surgery. Each state-based transplant unit maintains its own waiting list. When donor organs become available they are offered first to the state where the donor has died. If there is no suitable recipient the organs are offered on a rotational basis, interstate and to New Zealand until a suitable recipient is found.

Several factors are taken into consideration in identifying the best matched recipients. Firstly, donor and recipient must be of a compatible blood group. Tissue cross-matching is also performed. Other characteristics, such as body size, must also be factored in. With hearts, lungs and livers, both donor and recipient must be of a similar height and weight. This is logical – the organs of a 100kg person would simply be too big to fit into a 50kg person. Conversely, the organs of a 50kg person would be too small to do the work required by a 100kg body.

Urgency of need and time on the waiting list are also taken into account. Because of the tight time frames involved and the need to ensure donor and recipient compatibility, recipients of the donated organs are known before the organs are retrieved. If there is no suitable recipient the organ is not removed.

Kidney allocation is done differently. A computer (National Organ Matching System) generates a list of the best matched recipients in Australia based on donor and recipient tissue typing. Each of us has several genetic markers located on the surface of most of our white cells. One particular group of genetic markers is called **HLA** or **H**uman **L**eukocyte **A**ntigens (leukocyte refers to white cells, and antigens refer to genetic markers). Tissue typing is the name given to the test which identifies an individual's **HLA**.

Tissue allocation (eye tissue, bone tissue, heart valves and skin)

Because tissues don't require a constant blood supply, they don't need to be transplanted as quickly as organs and can be stored for some time. The surgeon makes a request to the relevant Tissue Bank for eye tissue, bone tissue, skin or heart valves and the tissue is released as needed.

How long do organs last before they must be transplanted?

Not very long. Hearts and lungs are particularly sensitive to being without a blood supply and must be transplanted within four to six hours of retrieval. In the interim, the organs are stored at 4°C (yes, in an

ice-filled esky) to help with their preservation. The liver and pancreas must be transplanted within 12 hours and the kidneys within 24 hours of retrieval.

How long do tissues last before they must be transplanted?

Tissues undergo extensive screening and processing before being released for use. Tissue transplantation may not be life-saving but, it dramatically improves and enhances the quality of lives. For example, a person who is blind will not die without a corneal transplant but their life can be dramatically improved with the gift of sight.

- Eye tissue is stored for no more than seven days.
- Heart valve tissue cannot be used in less than four weeks but can be stored for up to 10 years.
- Bone tissue cannot be used in less than six months but can be stored for up to five years.
- Skin tissue can be used almost immediately and can also be stored for up to five years.

Tissues are either stored in liquid nitrogen at very cold temperatures or in deep freezers at minus 70 to minus 80 degrees Celsius.

FOLLOW UP

How are donor families cared for after the donation?

Immediately after the donation operation, the family is offered the opportunity to spend time with their loved one, if this is something they want to do. Either the Donor Coordinator or the hospital staff will support them during this time. The family may be told how the surgery went and what organs and/or tissues could be retrieved for transplantation.

If the family does not wish to spend time with their loved one immediately after retrieval surgery, the Donor Coordinator may make arrangements with them as to when it would be an appropriate time to telephone them about the donation outcome.

The donor family is provided with the contact details of their Donor Coordinator should they want to contact them any time and for any reason.

Verbal information given over the telephone is followed up with written confirmation. The Donor Coordinator writes to the donor's family confirming the outcome of the donation and providing some general information about the transplant recipient/s and their progress, but they cannot provide information regarding the identity of the recipients due to the legal restrictions of the Tissue Acts in each state. The donor family is also given information about grief and bereavement, donor family support services, and more details about donation and transplantation. Every state and territory has follow-up services for donor families.

Other services offered to donor families:

Services of Thanksgiving

Each year around Australia, ecumenical (or non-denominational) services of thanksgiving are held in remembrance of those who have died and generously donated organs and tissues. These services are attended by both donor families and recipients.

"Reflection" rose seedling plant and lapel pin

A rose called 'Reflection' was specially bred to honour donors and their families. This seedling plant is offered to all families to grow in memory of their loved one. We use the rose as a symbol to acknowledge the generosity of those who have died and donated. Each family is also offered a small rose lapel pin to wear if they choose.

Correspondence

Some donor families and recipients choose to correspond. This is done anonymously. Donor Coordinators facilitate this anonymous process and will forward correspondence to the relevant parties.