

Fact Sheet

Brain death and organ donation



Introduction

Organ donation saves the lives of people suffering with organ disease, which affects children and adults alike. For example, kidney disease can require people to be on dialysis in hospital for up to 6 hours a day, several days each week, before their organs finally give up and they die. After organ donation, recipients can leave hospital and return to their families, their work and their lives. It's the same for people suffering with liver, heart, lung and all major organ disease. Tissue donation, such as corneas and heart valves, are also vitally important to save and improve the quality of lives.

More than 30 000 Australians have received transplants in the last 60 years, and improved survival rates now mean that most recipients of organs or tissue can look forward to many years of productive life.

Who can donate organs and tissue?

Anyone can choose to donate – **there is no age limit** on the donation of some organs and tissue. Whilst age and medical history will be considered at the time of donation, it shouldn't be assumed that anyone is not healthy enough or that they are either too old or too young.

Recently an 85 year old was able to donate their kidneys to two recipients and Australia's youngest donor was a newborn baby who died of abnormal brain function and donated a liver to save the life of a 12-month child.

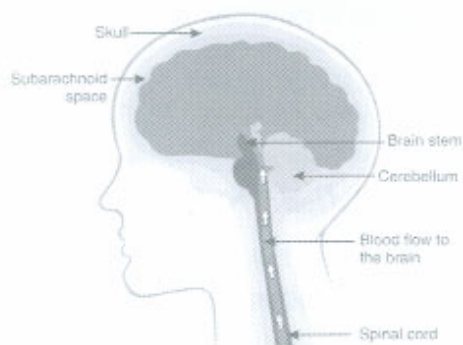
How is 'brain death' different from 'cardiac death'?

Most people understand that death occurs

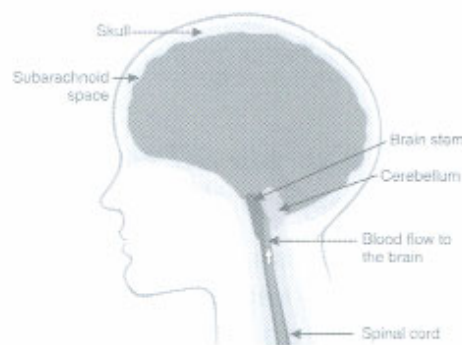
when a person's heart and breathing stop. This is called cardiac death and its how most people die. When someone has died of cardiac death, they do not breathe or move, they do not have a heart beat and their skin colour changes since blood is no longer circulating around the body. However, no one actually dies until the brain dies. The brain dies when blood stops being pumped to it. Other organs such as the heart and kidneys can stop working completely and in some circumstances are able to be revived – but not the brain. This is why people who have had a heart attack where their heart has stopped beating can be resuscitated - the heart may have stopped beating for a few minutes but because the brain hasn't died, the person may still be able to recover.

Death also occurs when the brain and brainstem stopped working completely – this is called **brain death**. The kinds of injuries which may cause the brain to die include accidents where there is trauma to the head, bleeding into the brain, infections or a long period of time without oxygen. As part of the treatment for these conditions, the person will be connected to a machine called a ventilator, which artificially pushes oxygen into the lungs, causing the chest to rise and fall as if the person is breathing. Even though the heart may still be beating and all other organs may still be working, **brain death is death**. The person cannot ever recover because the brain, once dead, can never be repaired.

A person who has died as a result of brain death will look very different to a person who has died from cardiac death. Because they are attached to the ventilator and receiving oxygen, the heart will continue to beat and the skin will be pink and warm. This is why it can be difficult to understand and accept that someone who is pink and warm and appears to be asleep is actually dead.



Normal Brain



Swollen Brain

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What causes the brain to die?

Like all of our organs, the brain needs a constant supply of oxygenated blood to keep working.

When any part of the body is injured it swells. The brain is no different. An injured finger or ankle can keep expanding because there is nothing to restrict it. The brain however, is contained within the rigid skull that limits how much it can expand. As the brain continues to swell, pressure builds up within the skull.

It is this increased pressure within the skull that causes so many damaging and permanent effects:

- The blood and oxygen stop flowing to the brain because the blood vessels get squashed.
- Without the oxygen, brain cells die and cannot re-grow or recover. This may cause further swelling.
- The swelling cause the brain to push down on the brainstem, which is where the spinal cord and the brain join at the back of the neck, and stops the functions of the brain stem.
- The brain stem controls breathing, heart rate, blood pressure and body temperature.

A person who is brain dead cannot and will not ever breathe on their own again. They will never be aware of who or what is around them. They will never feel pain or hope or joy or laughter. They cannot hear, talk, smell, cough or swallow.

How can the doctors tell when a person's brain has died?

There are a number of physical changes in pupil reaction, heart rate, blood pressure and body temperature that are experienced when the brain dies. These changes, together with the loss of other natural responses such as breathing, coughing and blinking, cause doctors to suspect that brain death as occurred. A number of specific tests are then done to find out whether or not the brain is working. Two appropriately qualified senior doctors perform tests to check if the cranial nerves, which originate in the brainstem and which control all vital involuntary reflexes, are

working. For a person to be declared brain dead there must not be any response to each and every one of the tests. The doctors will ensure that they are absolutely certain of the results of these tests prior to making the diagnosis of brain death.

What happens after a person is confirmed to be brain dead?

Once death has been confirmed, appropriate members of the medical team will speak with the family to determine if their relative had expressed any special wishes regarding organ donation. In the case of children, the wishes of the child's parents will be explored.

If the decision is made to grant consent for organ donation to occur, the person will remain in Intensive Care attached to the ventilator for a number of hours before being transferred to the operating theatre for the organ retrieval surgery.

If the option of organ donation is declined, the medical staff will speak with the family about removing the ventilator.

Do we have a say in which organs are donated?

Yes, absolutely. The medical suitability of organs and tissues would be discussed with you and your family and authorisation would be sought for the removal of those organs nominated by the family and next of kin.

Which organs and tissues are retrieved for transplantation in NSW?

Organs that can be donated include kidneys, heart, lungs, liver and pancreas. Tissue donation includes corneas, heart valves and bone.

What if a Coronial investigation is required as well?

In many cases brain death will be the result of a sudden accident or injury and may come

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with the jurisdiction of the Coroner. The Hospital staff will inform the family if the Coroner requires an autopsy. If an autopsy is required, organ and tissue donation may proceed with permission of the Coroner.

How are the organs retrieved?

Removal of organs is no different from any other surgical operation, and is performed by highly skilled surgeons. The donor is treated with respect and dignity at all times.

Is the body disfigured?

Apart from a surgical incision, the donation of organs and tissue does not alter the physical shape of the body. After the organs and tissue are removed and the operation is completed, the donor's families are able to see their relative again if they wish.

Can funeral arrangements proceed normally?

Yes. The family may make funeral arrangements as they prefer.

Are there any costs involved?

There is no charge to the family for organ donation or any other treatment given after death has been certified. There are no 'hidden costs'.

What are the religious opinions about organ and tissue donation?

Most major religions support organ and tissue donation as an act of caring and will leave the decision to the individual. You

should discuss any questions or concerns you have with your religious advisor.

Is the family told which organs and tissue were used and to whom they were given?

The donor coordinator writes to the donor's family with information regarding which organs and tissues were transplanted and how the recipients are progressing. Recipients may write letters of thanks to the donor's family via the donor coordinator. In accordance with the law, however, identifying information cannot be revealed to recipients or donor families.

What support services are available for donor families?

In Australia, families who are approached about donating their deceased relative's organ and tissues for transplantation are offered follow-up support. Organ and Tissue Donation Agencies provide bereavement aftercare programs in each State and Territory. LifeLink is the NSW and ACT State Organ and Tissue Donation Agency.

References

- Questions and Answers 2004. LifeLink Organ Donation Network NSW/ACT
- Recommendations concerning Brain Death and Organ Donation 2nd Edition 1998. Australian and New Zealand Intensive Care Society.
- Understanding Brain Death and Organ Donation: Living beyond Loss. Australian & New Zealand Organ and Tissue Donation Agencies.

**This fact sheet is for education purposes only.
Please consult with your doctor or other health professional
to make sure this information is right for your child.**

This document was reviewed on Tuesday, 1 June 2004.

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