Guideline

Organ Donation After Circulatory Death

Summary Describes the necessary requirements for health facilities to undertake organ donation after circulatory determination of death (DCDD) in NSW including the applicable setting for DCDD in NSW, donor referral criteria, patient management (including decision making and consent processes), ante-mortem procedures, criteria for the declaration of death, care of the patient and family (before and after the patient's death).

Document type Guideline

Document number GL2024_010

Publication date 26 July 2024

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Replaces GL2021_012

Review date 26 July 2029

Policy manual Not applicable

File number DG24/4423

Status Active

Functional group Clinical/Patient Services - Critical Care, Human Tissue
Corporate Administration - Governance

Applies to Public Health Units, Local Health Districts, Board Governed Statutory Health Corporations, Specialty Network Governed Statutory Health Corporations, Affiliated Health Organisations, Public Hospitals

Distributed to Ministry of Health, Public Health System, Divisions of General Practice, Government Medical Officers, NSW Ambulance Service, Tertiary Education Institutes

Audience Directors of Clinical Governance;Directors of Critical Care and Intensive Care Unit staff;Transplant Surgeons;Transplant Units;Operating Theatre Staff;Designated Officers;Directors of Emergency Departments;Emergency Department Staff

Secretary, NSW Health

NSW Health

Guideline

Organ Donation After Circulatory Death

Guideline Summary

This Guideline describes the necessary requirements for NSW Health facilities to undertake organ donation after circulatory death in NSW. This pathway involves the retrieval of organs after a person has been determined deceased based on the irreversible cessation of circulation of blood in the body.

The Guideline outlines the applicable setting for organ donation after circulatory death in NSW, donor referral criteria, patient management (including decision making and consent processes), ante-mortem procedures (consent and authority processes), criteria for the declaration of death, care of the patient and family (before and after the patient's death), the phases of organ retrieval and subsequent organ allocation.

Key Principles

Organ donation after circulatory death provides further donation opportunities for people who wish to be organ donors after their death and is a potential means of increasing the availability of deceased donor organs in NSW within current accepted ethical and legal requirements.

Quality end of life care for a potential organ donor, as with any individual whose cardio-respiratory support is being withdrawn, is the priority and must not be compromised by the donation process.

Once donation has been agreed upon and consented to, efforts should be made to ensure optimal outcomes for the donation. This includes the carrying out of certain ante-mortem procedures, provided consent and authorisation have been obtained and documented. The family must be fully informed regarding donation processes and warm ischaemic time for the donor organs must be minimised.

The NSW Organ and Tissue Donation Service is responsible for ensuring that organ and tissue donation and retrieval protocols in NSW are consistent with this Guideline, and for facilitating education and training on organ donation after circulatory death for NSW Health staff as required.

Intensivists, treating clinicians and donation specialists are to familiarise themselves with the donor referral criteria and management of potential organ donation after circulatory death donors (see Section 2, 3 and 4).

Clinicians certifying death for the purposes of organ donation after circulatory death must do so according to the criteria outlined in the attached procedures and using the prescribed state form (see Section 2.2.10).

Designated officers in hospital facilities must ensure that appropriate consent and authorisation are provided for ante-mortem procedures and for the removal of tissue after death (see Sections 2.2.4-7).

Transplant units who accept donation after circulatory death organs for transplantation are to familiarise themselves with the general principles of allocation for these organs (see Section 5).

Revision History

Version	Approved By	Amendment Notes
GL2024_010 July-2024	Deputy Secretary, Population and Public Health & Chief Health Officer	Amendments include: • Addition of 2.2.5 – Ante-mortem procedures • Addition of 2.2.6 – Consent to carry out ante-mortem procedures • Addition of 2.2.7 – Authorisation of ante-mortem procedures • Inclusion of definition – Ante-mortem procedure • Updated definition of – Electronic Donor Record • Updated definition of – Person Responsible • Inclusion of statement regarding voluntary assisted dying • Updates to 2.1 – Referral criteria • Update to 2.2 – Patient Management (Section 2.2.1, Section 2.2.2 Section 2.2.3 and Section 2.2.4) • Updates to 2.2.9 – withdrawal of cardio-respiratory support (clinical management) • Updates to intra-operative phase.
July-2021 (GL2021_012)	Deputy Secretary, Population and Public Health & Chief Health Officer	Changes in relation to the time period for circulatory determination of death in the context of organ donation.
March 2020 (GL2020_007)	Deputy Secretary, Population and Public Health & Chief Health Officer	Changes in relation to the time period for circulatory determination of death in the context of organ donation.
June 2014 (GL2014_008)	Deputy Secretary, Population and Public Health & Chief Health Officer	Amendments include: • Revised terminology from “cardiac” to “circulatory” death. • Changes to donor selection criteria. • A statement regarding the donation of DCD hearts for transplantation. • Changes in relation to the declaration of death including processes that are necessary after death before retrieval may commence. • Use of a Statewide form for the certification of death in these organ donors.
April 2011 (GL2011_005)	Deputy Director General, Population and Public Health & Chief Health Officer	Amendments relate to lung retrieval following DCD
June 2007 (GL2007_012)	Director General	New Guideline

Contents

1. Background

1.1. About this document

Donation after circulatory determination of death (DCDD) is an established pathway to organ donation.

DCDD is supported by the Australian and New Zealand Intensive Care Society's *Statement on Death and Organ Donation (Edition 4.1, 2021)* (2021) and the *Organ and Tissue Authority's Best Practice Guideline for Donation after Circulatory Determination of Death in Australia (Edition 1.0, October 2021)*. DCDD aligns with the definition of death for transplantation in the *Human Tissue Act 1983* (NSW).

The DCDD pathway involves the retrieval of organs and tissue after a person has been determined deceased based on permanent cessation of circulation in their body ('circulatory determination of death'). This requires either:

(i) a decision by the patient's treating team and family to discontinue cardio-respiratory support in a critical care setting, or

(ii) a patient who provided consent (this could include but is not limited to a patient who dies following the administration of medications for voluntary assisted dying).

This pathway differs from donation after neurological determination of death (also referred to 'brain death') where the patient is mechanically ventilated and physiologically supported after death has been determined.

This Guideline should be read in conjunction with:

NSW Health Policy Directives, Guidelines, Manuals and State Forms	
PD2023_014	*Verification of death and medical certificate of cause of death*
PD2024_022	*Organ and Tissue Donation, Use and Retention*
PD2024_023	*Designated Officer*
PD2010_054	*Coroners Cases and Coroners Act 2009*
GL2021_004	*End of Life Care and Decision-Making*
GL2023_013	*Management of the Potential Organ and Tissue Donor following Neurological Determination of Death*
Consent Manual	*Consent to Medical and Healthcare Treatment Manual*
State Form SMR010518	*Organ Donation – Circulatory Determination of Death*

State Forms can be ordered at Finsbury Green.

1.2. Key definitions

Ante-mortem procedure	The following medical procedures, other than normothermic regional perfusion, carried out to determine, maintain or improve the viability of tissue for a relevant purpose: (a) the administration of medication, (b) the removal of blood and tissue for testing, (c) medical imaging and other diagnostic procedures, (d) blood transfusions for the purpose of improving organ viability. (Section 27B *Human Tissue Act 1983* [NSW]).
Cold ischaemic time (CIT)	Cold ischaemic time is the period of time when an organ is cooled with a cold perfusion solution after retrieval surgery, until the tissue reaches physiological temperature during implantation procedures.
Designated officer (DO)	A designated officer is • In relation to a public hospital, a person appointed in writing by the governing body of a hospital to be a designated officer for the hospital, or • In relation to a private hospital, a person appointed in writing by the governing body (licensee) of the private hospital or • In relation to a forensic institution, a person appointed in writing by the governing body of a forensic institution, to be a designated officer for the forensic institution. (Section 5(1) *Human Tissue Act 1983* [NSW]). • Refer to NSW Health Policy Directive *Designated Officer* (PD2024_023).
Electronic Donor Record (EDR)	Captures potential donor data, medical-social history, family consent information and provides a real time electronic system for the offering and allocation of organs and tissues across Australia and New Zealand. The information may be disclosed only within the organ and tissue donation network across Australia (the DonateLife network), to transplant units, eye and tissue banks and sometimes to the organ donation network in New Zealand where relevant.

Extracorporeal membrane oxygenation (ECMO)	A technique providing both cardiac and respiratory support oxygen to patients whose heart and lungs are so severely diseased or damaged they can no longer serve their function.
Person responsible	If a person is not capable of consenting to their own treatment, the health practitioner must seek consent from their 'person responsible'. This is required and there is a hierarchy of people who can be the person responsible, in order of priority: • Guardian – an appointed guardian (or enduring guardian) who has been given the right to consent to medical and dental treatments, or • Spouse or partner – if there is no guardian, a spouse, de-facto spouse or partner (including same sex partner) where there is a close continuing relationship, as long as they are not a person under guardianship or • Carer – if there is no spouse or partner, an unpaid carer who provides or arranges for domestic support on a regular basis, or • Relative or friend – if there is no carer, a friend or relative who has a close personal relationship, frequent personal contact and a personal interest in the person's welfare, on an unpaid basis. The person responsible for a child (a person less than 18 years) is the person having parental responsibility for the child. However, if the child is in the care of the Minister responsible for the *Children and Young Persons (Care and Protection) Act 1998* [NSW], then the Minister is the person responsible, or if the child is in the care of the Secretary for the NSW Department of Communities and Justice then the Secretary is the person responsible (Section 33A, *Guardianship Act 1987* [NSW]).
Senior available next of kin	As per Section 4 of the *Human Tissue Act 1983* (NSW) a senior available next of kin is: In relation to a child who is living: • a parent of the child, or • if a parent is not available, a person who is a guardian of the child. In relation to a child who is a potential tissue donor or a deceased child: • a parent of the child, or

	• if a parent of the child is not available, a sibling of the child who is 18 years of age or over, • or if none of the above is available, a person who was a guardian of the child immediately before the death of the child. Where the child is in the care of the state, specific provisions for consent to organ and tissue donation apply (see *Human Tissue Act 1983* [NSW]). In relation to any other potential tissue donor or deceased person a senior available next of kin is: • a person's spouse (which can include a de facto spouse and same sex partner), or • if there is no spouse or the spouse is not available, a child of the potential tissue donor or deceased person who is at least 18 years of age, or • if no person referred to above is available, a parent of the potential tissue donor or deceased person, or • if no person referred to above is available, a brother or sister of the potential tissue donor or deceased person who has attained the age of 18. The potential tissue donor is the person on whom an ante-mortem procedure is to be carried out.
Warm ischaemic time (WIT)	Is variously defined as either the time from withdrawal of cardio-respiratory support (WCRS) to commencement of cold preservation solution; the time from arrest until cold flush or the time from when systolic blood pressure ≤ 50mmHg to the commencement of cold perfusion.
Withdrawal of Cardio-respiratory Support (WCRS)	Withdrawal of cardio-respiratory support is defined as the cessation of cardiac and ventilatory support. The withdrawal of ventilatory support includes the removal of the endotracheal tube or the tracheostomy tube. The withdrawal of cardiac support most commonly refers to the cessation of inotropes and vasopressors but could also include the cessation of intra-aortic balloon counter pulsation and/or extra corporeal membrane oxygenation.

1.3. Legal and legislative framework

This Guideline is underpinned by the requirements of:

- the *Human Tissue Act 1983* (NSW) and

- the *Human Tissue Regulation 2020* (NSW).

2. Potential Donor Categories and Selection Criteria

The 'Maastricht' classifications were developed to categorise potential donors after circulatory determination of death on a clinical basis and are widely accepted internationally.

In NSW, only Maastricht category III, IV and V patients are regarded as suitable for donation after circulatory determination of death (DCDD), and these 3 categories are permitted in NSW. Categories I and II are not undertaken due to the challenges in obtaining appropriate consents, logistic difficulties and the prolonged or unknown warm ischaemic time.

Maastricht classifications		
Category I	Dead on arrival - unknown warm ischaemic time. Tissue (corneas, heart valves, skin, bone, etc.) can be recovered from Category I donors or any individuals who die in a manner not suitable for solid organ recovery. Since there are no immediate time constraints to minimise tissue injury, there is no requirement for a precisely timed approach to tissue recovery.	Uncontrolled
Category II	Unsuccessful resuscitation – known warm ischaemic time. These are patients who suffer a witnessed cardiac arrest in the hospital and undergo unsuccessful cardiopulmonary resuscitation (CPR). When CPR fails in a medically suitable organ and tissue donor, organ donation is an option.	Uncontrolled
Category III	Withdrawal of treatment – known and limited warm ischaemic time. With the permission of the donor or donor family, organs and tissue may be recovered after death is declared from patients with irreversible brain	Controlled

Maastricht classifications		
	injury or respiratory failure and in whom treatment is withdrawn. Death is declared after a predetermined period of circulatory arrest.	
Category IV	Cardiac arrest following neurological determination of death but before planned organ retrieval - known and potentially limited warm ischaemic time. Rarely, a consented brain dead donor has a cardiac arrest before scheduled organ and tissue recovery. Such Category IV donors should either proceed as for a normal multi-organ and tissue retrieval - if this has already started - or should be managed as a Category III donor as appropriate to the circumstances of cardiac arrest.	Uncontrolled if unexpected otherwise controlled
Category V	Medically-assisted circulatory death in an intensive care unit (ICU), ward or operating theatre.	Controlled

2.1. Referral criteria

All patients who may be considered potential donors after circulatory determination of death should be referred to the NSW Organ and Tissue Donation Service for medical assessment of suitability for donation. This will include consideration of whether the patient may progress to death based on neurological criteria.

The following referral criteria must be met:

- the patient identity is known
- the patient falls within 'Maastricht' Category III, IV or V
- death is expected within 120 minutes.
- age:
    - adults - up to and including 75 years of age
- weight:

- for infant and paediatric donors, selection is based on weight (rather than age). Paediatric donors should weigh 3 kilograms or more.

Where there is uncertainty regarding the suitability of the patient as a potential, expert opinion must be sought from the NSW Organ and Tissue Donations Service.

2.2. Patient management

2.2.1. Identification of patients who may proceed to donation after circulatory determination of death

Most patients that may proceed to donation after circulatory determination of death are patients in a critical care unit where a decision has been made to transition to end-of-life care. The decision to withdraw cardio-respiratory support measures such as mechanical ventilation and/or inotropes and vasopressors must be made prior to, and independent of, any consideration of organ donation. For further information refer to the NSW Health Guideline *End of Life Care and Decision-Making* (GL2021_004).

Either the family or the treating team may raise organ and tissue donation as a potential end of life outcome.

A small number of patients that request and are approved for voluntary assisted dying may be eligible for consideration to proceed to donation after circulatory determination of death, where this aligns with their wishes. If this is something the patient wishes to discuss, the patient should raise this with their authorised voluntary assisted dying coordinating practitioner in the first instance.

The NSW Organ and Tissue Donation Service must be contacted about any patient on a voluntary assisted dying pathway that enquires about donation. These patients can provide first-person consent to donation and related interventions and are therefore different from the majority of donors where circulatory death follows the withdrawal of life-supportive therapies.

2.2.2. Referral to NSW State Coroner

Refer to the NSW Health Policy Directive *Coroners Cases and the Coroners Act 2009* (PD2010_054) for more information on reportable deaths and the role and responsibility of the coroner.

Where the death of a person is reportable to the coroner, the treating team is responsible for completing the State Form *Coronial Checklist* (SMR010513). The Donation Specialist or Tissue Donor Coordinator is to liaise directly with the Forensic Pathologist and the coroner.

2.2.3. Preliminary evaluation of suitability for potential donation after circulatory determination of death

Organ donation is not appropriate if, in the judgement of the treating intensivist, a person is likely to survive significantly longer than 120 minutes after withdrawal of cardio-respiratory support.

The donation of solid organs after circulatory determination of death is not viable beyond 120 minutes after the withdrawal of cardio-respiratory support. This is a general guide and the specific time limits that apply to the donation of specific organs are outlined in Section 4.2.

Accurately predicting the timing of death is difficult, as sometimes a person's dying process is longer than anticipated. The use of predictive algorithms to assess the likelihood of the person dying within the 120 minute period is a matter for the treating intensivist(s).

The person is no longer suitable for organ donation if the person does not die within the requisite timeframe (as applicable to the organs planned for donation). In this situation standard end of life care processes are continued. However, tissue donation after death may still be possible.

2.2.4. Organ and tissue decision-making and consent

The Family Donation Conversation must be handled with great care and sensitivity, and in accordance with the Organ and Tissue Authority's *Best Practice Guideline for Offering Organ and Tissue Donation in Australia (Edition 2, April 2021)*.

Discussion with the family regarding potential donation after circulatory determination of death must be, where possible, made after the decision by the treating team and family, is made to withdraw cardio-respiratory support. Separating the discussions is important for bereaved families, as it supports them in making clearer and more informed decisions about donation. It also avoids any perceived conflict of interest between decision making for end of life and donation.

End of life decisions with the family should be managed by a multidisciplinary team according to the NSW Health Guideline *End of Life Care and Decision-Making* (GL2021_004).

Other attending medical specialists should be informed if donation after circulatory determination of death is being considered.

Discussions with the family regarding withdrawal of cardio-respiratory support and donation after circulatory determination of death must be clearly documented and placed on the patient's medical record and uploaded to the relevant donor file.

If consensus with the family about withdrawal of cardio-respiratory support cannot be reached, or conflict cannot be resolved, then consideration of a potential donation after circulatory determination of death is not appropriate.

If there is agreement to proceed with donation, consent must be obtained.

If the person has previously given written consent to donation through the Australian Organ Donor Register, or other accepted means, the designated officer for the hospital may authorise donation in accordance with the *Human Tissue Act 1983* (NSW). The authority in writing must be given before procedures can be performed. This authorisation may be provided before death but only becomes effective after death has been certified.

If the deceased had not previously given written consent to donation, the senior available next of kin must provide written consent to the donation after which the designated officer may authorise donation, in accordance with the *Human Tissue Act 1983* (NSW).

Where the death is reportable to the coroner, the designated officer must confirm that coronial consent has been granted for donation to proceed.

A verbal consent given by the coroner should be confirmed by a written certificate as soon as practical.

2.2.5. Ante-mortem procedures

Certain ante-mortem procedures are now permissible in NSW following the Human Tissue Amendment (Ante-mortem Interventions) Act 2024 (*Human Tissue Act 1983* (NSW)*, Part 4A, Ante-mortem Procedures for Donation of Tissue After Death*). The procedures are carried out to determine, maintain or improve the viability of tissue, provided consent and authorisation have been obtained and documented.

The following ante-mortem procedures are allowed:

- the administration of medication,
- the removal of blood and tissue for testing,
- medical imaging and other diagnostic procedures,
- blood transfusions for the purpose of improving organ viability.

2.2.6. Consent to carry out ante-mortem procedures

A potential tissue donor can provide written consent to ante-mortem procedures.

Where the potential tissue donor lacks capacity to provide consent for ante-mortem procedures, then a senior available next of kin of the potential tissue donor can provide consent.

The senior available next of kin must not provide consent if there is reason to believe that the potential tissue donor has expressed an objection to the carrying out of an ante-mortem procedure on themselves.

A senior available next of kin of the potential tissue donor cannot delegate their responsibility to ante-mortem procedures to another person.

In the event where the potential tissue donor has not provided consent to ante-mortem procedures and there are no known senior available next of kin of the potential tissue donor then a designated officer must be satisfied that:

- the potential tissue donor has, during the potential tissue donor's lifetime, provided consent in writing to the removal of tissue for a relevant purpose, and
- the consent (for removal of tissue) has not been revoked, and
- the potential tissue donor has not expressed an objection to the carrying out of an ante-mortem procedure on the potential tissue donor.

As per the *Human Tissue Act 1983* (NSW), relevant purpose means the expected transplantation of tissue, excluding gametes, from a potential tissue donor's body, after the potential tissue donor's death, to the body of another living person.

2.2.7. Authorisation of ante-mortem procedures

For ante-mortem procedures to be authorised, the designated officer must be reasonably satisfied that:

1. authorisation to remove tissue after the death of the potential tissue donor will be given, and
2. a prescribed practitioner has certified in writing that they are reasonably satisfied the death of the potential tissue donor is imminently expected, and the carrying out of an ante-mortem procedure will not:
    i. hasten the death, or
    ii. cause more than minimal harm, or
    iii. cause undue risk to the potential tissue donor.

A prescribed practitioner is a designated specialist or if they are not available, an experienced medical practitioner who is not involved in transplantation procedures, or the care of the potential tissue donor or the recipient of tissue.

However, an ante-mortem procedure must not be carried out if:

- a potential tissue donor, has during their lifetime, expressed an objection to the carrying out of ante-mortem procedures on themselves
- a person responsible (refer to Section 1.2) has consented to treatment under the *Guardianship Act 1987* (NSW) and the treatment is incompatible with the ante-mortem procedure
- it is reasonably likely to interfere with the functions of the coroner under the *Coroners Act 2009* (NSW).

2.2.8. Comprehensive evaluation as a potential donor

The attending Donation Specialist will complete the necessary details in the Electronic Donor Record to facilitate risk assessment of the patient and assessment of specific organs and tissue for their suitability for transplantation.

The Donation Specialist will contact the medical consultant on call for the NSW Organ and Tissue Donation Service to discuss the patient's suitability as a donor.

The Donation Specialist will then refer clinical and risk assessment information to the relevant on call medical specialist for determination of medical suitability.

The management of any additional devices the patient may have in situ such as pacemakers and chest drains, etc. should be considered in evaluating the patient.

2.2.9. Withdrawal of cardio-respiratory support

Responsibility for all end of life care should remain with the patient's treating team.

Location

Retrieval of the liver and the heart requires minimal warm ischaemic time, as these organs are extremely sensitive to the effects of warm ischaemia. The optimal location of withdrawal of cardio-respiratory support to enable donation is therefore the operating theatre complex.

On occasion withdrawal of cardio-respiratory support needs to occur in the intensive care unit for logistical reasons.

Preparing the family

The family may remain present while cardio-respiratory support is withdrawn and until the patient's death, regardless of the location. The family should be informed that medications given following withdrawal of cardio-respiratory support are to keep the patient comfortable.

The family should be prepared for the speed with which procedures need to commence after the patient's death.

Clinical management

The focus of management at this stage should be on providing comfort, respecting dignity to the patient and providing support to the family. Any pain or distressing symptoms following withdrawal of cardio-respiratory support may be managed with analgesia and sedation. These medications should be titrated to obtain the appropriate clinical effect for comfort.

If used, extracorporeal membrane oxygenation should be withdrawn along with other cardio-respiratory support.

Following the withdrawal of cardio-respiratory support, monitoring of arterial blood pressure, heart rate and oxygen saturation should continue, as this provides information on key parameters that determine organ suitability prior to death.

A heparin bolus (such as 25,000 units [or 300 u/kg]) is given at the time of withdrawal of cardio-respiratory support, although if there is any concern that heparin may cause harm or hasten death (such as in a potential DCDD donor with an intracranial haemorrhage), the heparin can be given when the patient is apnoeic.

2.2.10. Declaration of death

The Australian and New Zealand Intensive Care Society's *Statement on Death and Organ Donation* (Edition 4.1, 2021) specifies death will be determined to have occurred when all the following criteria are present:

- absence of spontaneous movement
- apnoea (absence of breathing)
- absence of circulation as evidenced by absent arterial pulsatility for a minimum of 5 minutes using intra-arterial pressure monitoring and confirmed by clinical examination (absent heart sounds and/or absent central pulse). In cases without an arterial line, electrical asystole should be observed for a minimum of 5 minutes and confirmed by clinical examination.

When all these criteria have been met, the patient is determined to be dead and retrieval surgery may proceed. Death should be certified by a medical officer, other than a member of the organ retrieval or transplant team using the NSW Health State Form *Organ Donation - Circulatory Determination of Death* (SMR010518).

Interventions, such as reintubation of the lungs, should not be instigated until after death has been declared.

The appropriate authorisations are then obtained, and documentation is finalised (see section 4.1 for further information). This short period of time may be used by the family to say goodbye to the patient.

Once all documentation is finalised the retrieval surgery phase may commence.

All significant time-points, including the time and date of death, the period after death, and commencement of organ and tissue retrieval must be accurately documented in the patient's records and formal donation after circulatory determination of death data sheet.

2.2.11. Use of donation after circulatory determination of death hearts for transplantation

It is the terminal pathology within the person's body that causes the heart and circulation to cease and resuscitation is not appropriate in this circumstance. When the circulation ceases and is absent for a minimum of 5 minutes, the circulation is considered to have irreversibly stopped and death is then certified.

Although it may be technically possible to restore the arrested circulation, it must not be restored in this context.

There are no legal barriers to using hearts retrieved from donation after circulatory determination of death for transplantation, provided death of the person is declared consistent with the law in NSW.

2.2.12. Counselling available for the families of organ donation

Counselling support must be offered to the family, as required, and in accordance with usual hospital procedures. Following donation after circulatory determination of death, the family should be offered bereavement aftercare via the Donor Family Support Service as facilitated by the NSW Organ and Tissue Donation Service.

If required, staff members should also be offered counselling support.

3. Consideration of Specific Issues for Donation After Circulatory Determination of Death - Paediatric

Like in adult cases the end of life care for the dying child and the family is paramount. Paediatric centres that support paediatric donation after circulatory determination of death

should develop a local protocol consistent with this Guideline. Care and attention should be placed on:

- appropriate patient identification
- provision of information to the family.

Ideally, paediatric donation after circulatory determination of death (DCDD) will occur in facilities that have paediatric expertise to guide the process. Consideration may need to be given to potential transfer of patients from an adult facility to a paediatric facility. If transfer is not deemed appropriate, as in the case of an older child or teenager, then guidance from a paediatric intensive care specialist should be considered.

4. Retrieval Surgery

The nature of the surgical process depends on whether a single or multi-organ retrieval is to be performed.

4.1. Pre-operative phase

After death has been declared and prior to retrieval surgery commencing, the following need to occur as expeditiously as possible:

- completion of essential documents related to death certification and authorisation of organ donation (see Section 2.2.10 for further information)
- family leave taking
- transfer to operating theatre in some circumstances
- reintubation of a donor without ventilation (only in the case of lung donation)
- transfer onto the operating table (if required).

4.2. Intra-operative phase

The surgical retrieval process is partly dictated by which organs are to be retrieved:

- liver and pancreas retrieval may occur if death occurs within 30 minutes of the withdrawal of cardio-respiratory support.
- heart retrieval may occur if death occurs within 30 minutes of a sustained fall in the systolic blood pressure to below 90mmHg following withdrawal of cardio-respiratory support to cold perfusion.
- renal retrieval may occur if death occurs within 60 minutes of a sustained fall in the systolic blood pressure to below 50mmHg following withdrawal of cardio-respiratory support to cold perfusion.
- lung retrieval may occur if death occurs within 90 minutes of the withdrawal of cardio-respiratory support.

For multi-organ retrieval, an ultra-rapid laparotomy is performed in tandem with a sternotomy. The aim is to cannulate the aorta and, if necessary, the pulmonary artery to initiate preservation solutions as required. The thoracic aorta is cross-clamped and the right atrium vented. Heparin is added to the preservation solution.

Topical cooling of the thoracic and abdominal viscera with saline slush is also performed, as required. Once organ flushing with preservation solution has occurred, the surgical procedure continues as for a standard multi-organ retrieval, or as a renal only retrieval depending on the circumstances.

The commencement of extracorporeal membrane oxygenation to simulate physiological function as a post-mortem donor management tool (such as augmentation of oxygen delivery to re-perfuse organs) is not permitted in NSW at this time.

The same criteria should be used to assess the quality of organs from donation after circulatory determination of death (DCDD) donors and organs from donors determined dead by neurological criteria. This includes an intra-operative assessment and documentation in the electronic donor record of the adequacy of perfusion with the preservation solution along with identification of any abnormalities.

4.3. Post-operative management

Families must be offered the opportunity to view the deceased's body after donation.

Following retrieval surgery, the deceased's body should be moved to the facility's mortuary or other suitable viewing area.

If the death falls within the coroner's jurisdiction (adult or child), the formal identification of the deceased may also be required and can occur in the mortuary or other suitable viewing area.

If the donor has consented to tissue retrieval, the NSW Tissue Bank must be notified of the completion of solid organ retrieval surgery.

5. General Principles of Allocation of Organs

Allocation of organs donated after circulatory determination of death should be in accordance with the Transplantation Society of Australia and New Zealand's *Clinical Guidelines for Organ Transplantation from Deceased Donors* (Version1.12 - 2023).

It should be considered that organs retrieved from donors will have been subjected to varying periods of warm ischaemia. Additionally, it is recommended that cold ischaemic times be minimised. While this does not preclude organs from being offered to interstate recipients, the potential increased cold ischaemic times should be considered.

The information provided to a potential organ recipient at the time of waitlisting and/or when obtaining their consent to transplantation must include the potential implications of receiving an organ donation after circulatory determination of death (such as delayed graft function).

6. References

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7. Appendix

1. Organ Donation after Circulatory Determination of Death: Process

7.1. Appendix 1: Organ donation after circulatory determination of death: process