Paediatric Donation Resource Manual

A Tool to Assist Hospitals with the Process of Organ and Tissue Donation
Dedication

This manual is dedicated with gratitude and admiration to the individuals and families who make the decision to help others through the gift of organ and tissue donation.

And to the healthcare professionals who teach, learn and strive to help children and their families every day.
Introduction

Trillium Gift of Life Network (TGLN) is committed to creating a culture that enables every parent to make an informed decision about organ and tissue donation and to support healthcare professionals in implementing those decisions.

This resource manual was developed by TGLN as a tool to support healthcare professionals.

Following these guidelines will help advance knowledge and understanding of the merits of organ and tissue donation, and ultimately lead to saving and transforming lives.

Working together, we can make a difference in the lives of those children and adults awaiting organ and tissue donations while bringing comfort to the families of donors whose generosity has given renewed hope to another family.

Every effort has been made to ensure that all information and references contained in the manual are as up-to-date as possible. However, the constantly evolving world of legislation, guidelines and research can have a direct impact on the contents contained within. TGLN will do its best to keep you apprised of changes that might have a significant impact on the process for organ and tissue donation.

If you have any questions about the contents of this manual, please call TGLN at 1-877-363-8456 (toll free) or in Toronto at 416-363-4438.
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The Referral and Notification Process
Over the past few years, changes in Canadian hospital accreditation standards, Ontario legislation, as well as innovations in donation and transplantation have led to new referral practices for organ and tissue donation. To ensure every opportunity to donate is assessed, critical care units and emergency departments that care for ventilated patients now call Trillium Gift of Life Network (TGLN) when children or adult patients meet referral indicators for high risk of imminent death or at death. Timely referral is necessary to determine medical suitability and establish a plan of support for hospitals if there is potential for organ donation. Additionally, this provides an opportunity for the donation team to work with the hospital team to plan for the donation discussion with parents and family in paediatric settings.

**Fast Facts**

- Donation after death by circulatory determination (DCD) is expanding the opportunity to donate – more children than ever before can be organ donors.
- Advanced technology is making it possible to maintain or improve organ function (e.g. kidney and lungs) after recovery and prior to transplant. This is expanding the number of organs that can be transplanted from one donor.

**Who can be a donor?**

- Most children and adults can be a tissue donor at death.
- To be an organ donor, the child must have sustained a non-recoverable injury and be mechanically ventilated at the time TGLN is notified.
- What organs or tissue a child can donate largely depends on the type of hospital unit the child is in at end-of-life (intensive care units/critical care units (ICUs/CCUs) and emergency departments (EDs) for organ and tissue donation; other units such as palliative care units for tissue exclusive donation) as well as the child’s current and past medical history.
- Each child’s eligibility to donate is evaluated on a case-by-case basis.
- Every eligible child/family in Ontario has the opportunity to leave a lasting legacy through organ and/or tissue donation at end-of-life.

**Donation after neurologically determined death (NDD)**

- Any child who has been pronounced dead by neurological criteria may be a potential organ and/or tissue donor.
Donation after death by circulatory determination (DCD)

- Any child who has sustained a non-recoverable injury, who is on life-sustaining therapy and who does not meet the criteria for neurological death, may be a potential organ and tissue donor with DCD. This can occur only in situations of planned withdrawal of life-sustaining therapy (WLS).

Who can identify and refer a potential donor?

While any member of the healthcare team may identify a potential donor, the referral should be made under the direction of an MD/RN/RN(EC)/RPN or other TGLN-approved professional to obtain the appropriate clinical information about the child who may be a potential donor.

When should TGLN be contacted?

Consistent with Accreditation Canada standards, all ICUs and EDs should contact TGLN when the child meets clinical triggers/referral indicators for high risk of imminent death in situations where the child is ventilated.

Call Trillium Gift of Life Network 1-877-363-8456 or 416-363-4438 with all ventilated children who meet any of the Referral Indicators for High Risk of Imminent Death:

- \text{Grave}\text{ }\text{prognosis or GCS} = 3 \text{ (where applicable)}
- \text{Injured}\text{ }\text{brain or non-recoverable injury/illness}
- \text{Family}\text{ }\text{initiated discussion of donation or withdrawal of life sustaining therapy}
- \text{Therapy}\text{ }\text{limited, de-escalation of treatment, or withdrawal of life sustaining therapy discussion planned}

It is always appropriate to contact TGLN when families have questions about organ and tissue donation

What is Routine Notification and Request?

Legislation directly affecting the referral and notification process in designated hospitals across Ontario came into effect in January 2006. This means that TGLN should be contacted by hospitals that have been advised they must report deaths and that are participating in the “Call-Screen-Connect” process with every expected death, including:

Ventilated children:

- As outlined above

Non-ventilated children:

- On admission to palliative care units or when palliation (comfort care) is planned
- When the topic of donation is raised by the family
With every unexpected death:
  • within one (1) hour of death

What is timely referral?
A timely referral is a call made by the hospital to TGLN before setting a time for WLS and prior to any organ/tissue donation discussion with the family.

TGLN has collected data that indicates that timely referral has an impact on the family’s decision to consent to donation. This data has shown that there are more positive consent outcomes when a referral to TGLN is made prior to the family setting the actual time for WLS.

What information is needed to decide if there is an opportunity to donate?
Specific information is required with each referral for TGLN to register the referral, provide a TGLN number and assess the specific donation opportunities available for each child and family.

The following preliminary information is needed:
  • Caller’s name and professional designation (MD, RN, RPN)
  • Hospital/unit name
  • Name/age/date of birth (DOB)/hospital identification number/health card number of the child
  • Admission date
  • Family contact information
  • Suspected cause of death
  • Admitting diagnosis
  • Time and date of death
  • Time and date of intubation (if the child had an endotracheal tube or tracheostomy)
  • Positive history of specific diseases
  • Weight/height
**Diagram 1**

**CLINICAL TRIGGER/REFERRAL INDICATOR ALGORITHM FOR TRILLIUM GIFT OF LIFE NETWORK (TGLN) REFERRAL**

*Note:* In designated hospitals *all* imminent deaths must be referred to TGLN.

Call Trillium Gift of Life Network (TGLN) when a *ventilated* child meets the following referral indicators for high risk of imminent death

- **G** Grave prognosis or Glasgow Coma Scale (GCS) = 3
- **I** Injured brain or non-recoverable injury/illness
- **F** Family initiated discussion of donation/withdrawal of life sustaining therapy or treatment (WLS)
- **T** Therapy limited, de-escalation of care, or WLS discussion planned

**Call TGLN**

1-877-363-8456 or 416-363-4438

**TGLN will:**

1) Assess opportunity for saving lives through organ and tissue donation.
2) Provide support for advanced assessment and support the healthcare team.
3) Initiate the donation conversation with family in collaboration with the healthcare team following neurological death or WLS discussion.
4) Determine if the child has a donation consent registered in the OHIP database (for children over 16 years of age only).
Step 2

Determination of Death
## Step 2: Determination of Death

Organ and tissue donation is possible: **a)** following pronouncement of death using NDD criteria or, **b)** following the decision for WLS and pronouncement of death by circulatory determination (DCD potential). DCD can only occur in situations where WLS can be planned and consultation with TGLN has occurred in advance.

### Call TGLN prior to discussion of WLS or mention of donation to family.

<table>
<thead>
<tr>
<th>NDD</th>
<th>DCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catastrophic brain injury with ventilator dependence</td>
<td>Non-recoverable injury with ventilator dependence</td>
</tr>
<tr>
<td>Determination of NDD</td>
<td>Family/healthcare team agree on withdrawal of life sustaining therapy (WLS)</td>
</tr>
<tr>
<td>Consent for donation</td>
<td>Consent for donation</td>
</tr>
<tr>
<td>Continuation of therapy to support organs</td>
<td>Continuation of therapy to support organs until WLS</td>
</tr>
<tr>
<td>Continuation of therapy until organ recovery</td>
<td>Determination of death by circulatory criteria and organ recovery</td>
</tr>
</tbody>
</table>
Neurologically Determined Death (NDD)

NDD is defined as the “irreversible loss of the capacity for consciousness combined with the irreversible loss of all brainstem functions, including the capacity to breathe” (Canadian Neurocritical Care Group 1999).

TGLN accepts criteria developed at a consensus conference coordinated by the Canadian Council for Donation and Transplantation (CCDT) in 2003 as the standard for NDD. The CCDT states that diagnosing neurological death involves determining the irreversible loss of brain stem reflexes, such as a cough or gag, as well as absence of pupillary response to light. There is no spontaneous movement or central response to pain, although spinal reflexes may persist. The child is also no longer able to breathe (apneic), requires mechanical ventilation and his/her capacity for consciousness has been irreversibly lost.

What conditions may lead to neurological death?

**Acute brain injury:** Head trauma from motor vehicle collisions, intracranial hemorrhage from any cause including stroke, vascular malformation, intracranial tumor or acute hydrocephalus.

**Hypoxic-ischemic encephalopathy:** Post-cardiac or respiratory arrest, near-sudden infant death syndrome, near drowning, asphyxia, hypovolemic shock.

**Central nervous system (CNS) infection:** Meningitis, encephalitis, generalized sepsis.

**Miscellaneous:** Metabolic encephalopathy from liver disease; diabetic ketoacidosis, inborn errors of metabolism, acute hyponatremia or vasculitis.

What are paediatric considerations for NDD?

Within the paediatric population, CCDT specifies the following age definitions:

**Newborns:** >36 weeks gestation and <30 days (corrected for gestational age)

**Infants:** >30 days and <one (1) year (corrected for gestational age)

**Child:** >one (1) year and <18 years
A single apnea test may be performed in children over one year (as with adults) if both physicians are present at the time of the test.

**What are the general considerations for declaration of death by neurological criteria?**

- The declaration of death by neurological criteria must be performed by a physician who holds licensure to practice medicine independently in the Province of Ontario.
- A single declaration of death by neurological criteria meets the requirements for death.
- The legal time of death is marked at the time of completion of the first confirmation of neurological death. If ancillary testing is required, the time of death is when both the first clinical exam and ancillary test are completed.
- If the potential for donation exists, and in accordance with the *Trillium Gift of Life Network Act*, a physician who has had any association with the proposed transplant recipient that might influence the physician’s judgment must not take part in NDD.

---

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Neonates ($\geq$36 weeks gestation &amp; $&lt;$30 days) Requires specialist in Neonatology</th>
<th>Infants ($\geq$30 days &amp; $&lt;$1 year)</th>
<th>Children older than one year and adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Pain Stimuli</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pupillary Response</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Corneal Reflex</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Gag Reflex</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cough Reflex</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Oculovestibular Reflex (Cold Calorics)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Oculocephalic Reflex (Doll’s Eyes)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Suck</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apnea Test</td>
<td>✓</td>
<td>✓</td>
<td>✓*</td>
</tr>
<tr>
<td>Ancillary Test</td>
<td>If unable to complete any of the above</td>
<td>If unable to complete any of the above</td>
<td>If unable to complete any of the above</td>
</tr>
<tr>
<td>Time of 1st test</td>
<td>48 hours post birth</td>
<td>No fixed time</td>
<td>No fixed time</td>
</tr>
<tr>
<td>Interval between two exams</td>
<td>24 hours</td>
<td>Not specified, but at separate times</td>
<td>Can be done concurrently</td>
</tr>
</tbody>
</table>

*A single apnea test may be performed in children over one year (as with adults) if both physicians are present at the time of the test.*
• Assessment for neurological death may be unreliable following a resuscitated cardio-respiratory event. In instances where an acute anoxic-hypoxic encephalopathy has occurred, NDD should be delayed for 24 hours. Alternatively, an ancillary test may be performed in absence of a suitable time delay (see Page 20).
• The presence of therapeutic levels of anticonvulsants, sedatives, and analgesics does not constitute a contraindication to the diagnosis of neurological death.

What are the minimum criteria for declaration of death by neurological criteria?

• The child must have a known cause that has been documented as being capable of causing neurological death and a complete absence of confounding factors (see below) that are capable of mimicking neurological death; this includes severe electrolyte abnormalities.
• The child’s body temperature must be greater than or equal to 34° C. (See Page 19 for neonates).
• The physician(s) involved in the declaration of death by neurological criteria must have the knowledge and ability associated with the management of children who have severe brain injury as well as in the declaration of death by neurological criteria for all relevant age groups within their care.

Fast Facts

Confounding factors to neurologically determined death (NDD) may include:
• Unresuscitated shock
• Low core body temperature <34°C (or <36°C for neonates)
• Treatable metabolic/endocrine/electrolyte disturbances (including hypernatremia, hypoglycemia, severe hypophosphatemia, liver and/or renal dysfunction)
• Peripheral nerve or muscle dysfunction due to disease or neuromuscular blocking agents (pancuronium, succinylcholine, etc.)
• CNS depressants/significant drug intoxications (e.g. alcohol, barbiturates, sedatives) – note that therapeutic levels of anticonvulsants, sedatives and analgesics do not preclude the diagnosis

What are the clinical criteria for declaration of death by neurological criteria for adults and children greater than or equal to one year of age?

• Bilateral absence of:
  • Pupillary response, with pupils greater than or equal to 3mm;
  • Corneal reflex;
  • Oculovestibular response; and
  • Motor response to central stimulation (e.g. sternal rub and clavicular pressure) excluding spinal reflexes
• Absence of a cough and a gag response.
• A lack of respiratory effort as determined by apnea testing.
• For organ donation purposes only, both clinical exams may be performed concurrently.
• One apnea test may be performed in the presence of both declaring physicians. However, if both physicians are not present, then a second clinical examination and separate apnea test must be performed for organ donation purposes.

What are the clinical criteria for declaration of death by neurological criteria for infants aged 30 days to one year (corrected for gestational age)?

• Bilateral absence of:
  ◦ Pupillary response, with pupils greater than or equal to 3mm;
  ◦ Corneal reflex;
  ◦ Oculovestibular response;
  ◦ Oculocephalic response; and
  ◦ Motor response to central stimulation (e.g. sternal rub and clavicular pressure) excluding spinal reflexes

• Absence of a cough and a gag response.
• A lack of respiratory effort as determined by apnea testing.
• For organ donation purposes only, the second clinical examination must occur separately and independently from the initial examination including apnea testing.
• There is no recommended time interval that must occur between the two examinations; however, each must be performed independently.

What are the clinical criteria for declaration of death by neurological criteria for newborns aged less than 30 days and greater than 36 weeks (corrected for gestational age)?

• Bilateral absence of:
  ◦ Pupillary response, with pupils greater than or equal to 3mm;
  ◦ Corneal reflex;
  ◦ Oculovestibular response;
  ◦ Oculocephalic response; and
  ◦ Motor response to central stimulation (e.g. sternal rub and clavicular pressure) excluding spinal reflexes

• Minimum body temperature must be greater than or equal to 36°C.
• Absence of a cough and a gag response.
• Absence of suck reflex.
• A lack of respiratory effort as determined by apnea testing.
• For this age group, there must be a minimum of 48 hours between birth and the first declaration of death by neurological criteria.

• For organ donation purposes only, a second determination of death by neurological criteria is required but cannot take place until an additional 24 hours after the first declaration of death has passed.

**Apnea Testing**

• All efforts to normalize the child’s baseline arterial blood gases must be performed; written documentation is required when unable to obtain a normalized baseline gas.

• A period of pre-oxygenation with FiO₂ of 1.0 is required for all apnea tests. The child will be provided with FiO₂ of 1.0 during the apnea test.

• Three criteria must be met during the apnea test to be acceptable for neurological death testing. The child’s PaCO₂ must rise above 60 mm Hg, there must be an increase of 20 mm Hg above the baseline PaCO₂, and the pH must be less than or equal to 7.28.

**Ancillary Testing**

• If a child is too unstable or becomes too unstable during the clinical exam (including apnea testing), or if any portion of the clinical exam for declaration of death by neurological criteria cannot be completed, ancillary testing will be required.

• Acceptable ancillary tests for declaration of death by neurological criteria are Computed Tomography Angiography (CTA), Radionucleotide Angiography, 4-vessel Cerebral Angiography, Magnetic Resonance Angiography (MRA), and Xenon CT.

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### Donation after death by circulatory determination (DCD)

**Who is eligible for DCD?**

In Ontario, organ and tissue DCD is now a possibility for children who do not meet the strict criteria for neurological or brain death. Children who meet the criteria for DCD are dependent on mechanical ventilation, and may include children at end-of-life with chronic ventilator-dependent conditions (e.g. Amyotrophic Lateral Sclerosis, Muscular Dystrophy, etc). DCD can only occur in situations where WLS can be planned and consultation with TGLN has occurred in advance.

**What if my hospital has no formal policy regarding DCD?**

If a family has raised the subject of donation, TGLN will provide assistance to hospitals to help carry out this request regardless of whether or not a policy is in place for DCD. It is important that both staff and hospital administrators have determined that they are able to proceed with DCD before the family is approached.
**What is the policy around WLS?**

Each hospital has policies related to end-of-life and WLS. The medical staff at the hospital and TGLN personnel will consult with the family regarding timing of withdrawal. Typically, WLS is carried out under the care of the physician and healthcare team caring for the child. Other physicians, depending on the specific hospital policy, may also be involved. TGLN personnel or any physician involved in the surgical recovery or care of the intended recipient will not be involved in WLS.

It is important to note that in all settings where life-sustaining therapy is withdrawn, the comfort of the child is of the utmost concern and should follow hospital or physician standard practice. The attending physician may administer analgesia or other medications for the comfort of the child based on clinical judgment and hospital protocol. Regardless of whether or not support is withdrawn in the ICU or in the operating room (OR), end-of-life care follows the same standard of care as with a child for whom organ donation is not possible.

**Where does WLS take place?**

WLS may occur in the ICU, the OR or another area close to the OR. Withdrawal in the OR setting is optimal to promote the best transplant outcomes. The decision will be discussed between the family, hospital and TGLN personnel.

**When is death pronounced in situations of DCD?**

Death is pronounced as per the hospital policy on WLS, or based on accepted medical practice. A second physician is required by the *Trillium Gift of Life Network Act* to confirm death for donation to occur. Neither physician can have a relationship with the intended transplant recipients. The legal time of death is the first pronouncement of death. A physician will confirm the absence of spontaneous respiration and the absence of a pulse pressure for a pre-determined period of time prior to the pronouncement of death.

**What if the child does not die within the timeframe needed for successful transplant?**

If the child does not die within an expected timeframe established with the transplant programs (organ dependant, usually 30–120 minutes), end-of-life care will continue and the child and family members present can be transferred to a previously agreed upon location.
Step 3
Coroner Considerations
Step 3:
Coroner Considerations

The Coroner’s permission to recover organ and tissues is required when the death is a Coroner’s case. TGLN works collaboratively with the Coroner’s Office to facilitate donation and the Coroner’s investigation, if needed. In Ontario and many other jurisdictions, Coroners are recognized as champions for organ and tissue donation and a number of Coroners have further supported donation through the provision of enucleation services.

Can donation occur when the death is a Coroner’s case?
Yes, Coroner involvement does not preclude the opportunity for organ or tissue donation even if the events of the child's death are suspicious or a homicide.

When is a donor a Coroner’s case?
As outlined in the Coroner’s Act, if there is reason to believe that the death was caused by violence, misadventure, negligence, misconduct or malpractice, the Coroner must be notified. In these circumstances, the Coroner must give permission to proceed with organ and/or tissue donation. Some hospitals have specific protocols indicating the local Coroner’s Office must always be notified about a death if the child is a potential donor. As this varies from facility to facility, verify hospital-specific directives.

How is the Coroner’s permission for donation obtained?
When a death appears to be a Coroner’s case, contact the local/regional Coroner’s Office. TGLN should be informed if the child's death (or imminent death) is considered a Coroner’s case under the Coroner’s Act. If possible, it is prudent to speak with the Coroner prior to a consent discussion with the family as the Coroner’s determination on exceptions to organ and tissue donation may impact the donation consent conversation.

When the child may have the opportunity to donate following WLS in DCD, and it is determined that they meet the criteria for Coroner involvement following death, the Coroner should be notified in advance of the donation discussion with the child's family.

If initial discussion with the attending Coroner indicates that permission for organ or tissue donation may be withheld, TGLN will contact the Office of the Chief Coroner of Ontario to discuss further.

Based on the information provided, the Office of the Chief Coroner will decide:

- whether donation may proceed;
- if there are any limitations to donation;
- if a physical exam or further examination of the child is needed by the Coroner prior to recovery; and
- if a Coroner’s representative is needed in the OR during recovery.
What documentation is needed from the Coroner to proceed with donation?

When a death is designated a Coroner’s case, the surgical recovery process (including transfer of body) may not start until the Coroner has granted permission. A Coroner/Forensic Pathologist Permission form (see below) will be provided by either the Coroner or TGLN when a Coroner’s case is deemed to be a potential donor. The form will be provided to the hospital as per hospital policy.

Does Coroner involvement impact funeral planning?

Coroner involvement in a donation case may directly impact the timing of the donation process and release of the body to the funeral home. In these circumstances, it is essential that information related to timing is shared with the family and discussed with the Coroner involved. TGLN coordinators ensure the family is aware of timing specifics.
Step 4

The Donation Discussion:
Communicating Registered Consent Decisions and Family Approach for Substitute Consent
Step 4:
The Donation Discussion:
Communicating Registered Consent Decisions and Family Approach for Substitute Consent

Diagram 2
COMPONENTS OF AN OPTIMAL DONATION DISCUSSION (NDD)

- Timely referral to TGLN as per clinical triggers/referral indicators and prior to discussions about withdrawal of life sustaining therapy (WLS)
- Pre-approach planning with the TGLN Coordinator
- Grave prognosis provided
- Consistent messages from team
- Family understanding of neurological death
- Time of death provided
- Separate conversation about death from donation discussion
- Introduction of TGLN Coordinator as healthcare team member
Most Ontarians support organ and tissue donation. It is important to never assume a family will not donate; in fact, refer to TGLN and plan the discussion as if the family were among the majority of Ontarians who would donate organs and tissues after death.

The goal of the donation discussion is to make sure that the child’s family is given the information, support and time needed to understand the opportunity to donate. This promotes an outcome that best reflects the child’s and/or the family’s choice about organ and tissue donation. Components of an optimal donation discussion that have been associated with positive consent outcomes are listed above and discussed in more detail below. Timing of referral, planning the donation discussion and involving a TGLN coordinator in the donation discussion all impact the family’s decision to donate.
Who has the legal authority to give consent?
Under Section 4(1) of the Trillium Gift of Life Network Act, any person who has attained the age of 16 years may consent to donation of their organs and/or tissues after death. If they have not reached 16 years of age, or not registered consent, Section 5(1) to (2) of the Trillium Gift of Life Network Act outlines the hierarchy, in descending order, of legal authority to give consent as the patient's substitute after the death of a person, as follows:

- The person’s spouse or same-sex partner.
- Any one of the person’s children.
- Either one of the person’s parents.
- Any one of the person’s brothers or sisters.
- Any other of the person’s next of kin.
- The person lawfully in possession of the body (e.g. executor of the will or administrator of the estate) with the exception of persons such as a funeral director or the administrative head of the hospital.

When is the optimal time for the donation discussion with the family?
The timing of the donation discussion is important in both NDD and DCD. A decoupled approach is recommended and is defined as introducing the concept of donation only after the family has had time to absorb the reality and finality of the diagnosis or has made a mutual decision with the healthcare team for WLS.

Two practices address the question of when to discuss donation:

1. **Only after the family understands the child will not survive.**
   As NDD can only happen if the child meets all the criteria for neurological death, it is suggested that one declaration of neurological death be completed before donation is discussed. If family members raise the topic of donation, they clearly understand how ill the child is.

2. **Providing the time of death when confirming neurological death.**
   Providing a time of death to the family has proven to be beneficial in helping families understand the finality of the situation.

When is the opportunity for DCD introduced to families?
In some cases, a family may raise the topic of donation opportunities with the healthcare team when they understand a grim prognosis. The decision for WLS should be made independent of the decision to donate. Therefore, DCD should be offered by an experienced requester after the decision for WLS has been made and prior to the actual withdrawal of therapy or setting of a time for withdrawal.

What is pre-approach planning? Why is it important? What are the benefits?
Pre-approach planning involves creating a shared communication plan between the healthcare team caring for a child/family and the TGLN coordinator. Recent data has shown that creating and following a plan for the donation discussion increases positive consent outcomes significantly.
Pre-approach planning makes sure that known best practices about the donation discussion, as listed below, are considered **prior** to raising the topic of donation with families.

- Shared understanding of child’s status and plan of care.
- Shared understanding of family dynamics, hospital experience and available support.
- Shared understanding of the family’s perception of the child’s status and care received.
- Established plan related to timing of:
  - Neurological death testing (if applicable)
  - Introduction of the TGLN coordinator
  - The donation discussion, including who will lead the discussion.

**When should pre-approach planning happen?**

As discussed in *The Referral and Notification Process* (Step 1), when the TGLN coordinator arrives onsite, he/she will meet with the healthcare team to review the child’s status and eligibility for donation and develop a plan of support for hospital staff. This may also occur over the phone at time of referral if the situation is moving quickly. The earlier pre-approach planning occurs, the greater the opportunity to ensure optimal conditions for the donation discussion with the family.

Clinical milestones that indicate pre-approach planning might start include:

- suspected non-recoverable brain injury;
- child meets hospital criteria for TGLN referral;
- suspected neurological death;
- planning to introduce a WLS discussion.

**Optimal Donation Discussion**

**What factors influence the decision to donate?**

The following three factors influence the decision to donate:

- Timing of referral related to setting the time to WLS.
- Planning (and following plan) for the donation discussion (pre-approach planning).
- Specially trained team member (TGLN coordinator) present during the donation discussion.

**How does the experience, attitude and language of the requester influence the decision to donate?**

Research indicates that families are more likely to donate when the discussion is with a requester who has experience talking to families about donation. TGLN coordinators receive quarterly training on the donation discussion. For this reason, it is recommended that the TGLN coordinator lead the discussion about donation. If the family raises the topic of donation, it is always appropriate for the TGLN coordinator to provide information to the family regardless of the status of the child.
Where will the discussion take place?
A quiet, private location should be selected to enable staff to optimally support the family.

What are the anticipated support needs for donor families?
- Social workers may provide information around end-of-life financial concerns (e.g. funerals, etc).
- Spiritual care staff, or the family’s spiritual advisor, may provide religious counseling and spiritual support during the donation conversation.
- Bereavement specialists may be available in some institutions to provide expert care.

What are other considerations when providing the opportunity for paediatric donation?
There are special considerations when the patient is a child. Often, the option of organ or tissue donation is solely dependent on parental willingness. Because children do not typically have the opportunity to learn about or understand what organ and tissue donation means, families sometimes struggle with the fact that they are making this decision for their child.

Families often reflect on the memories of their child. These thoughts enable them to view donation as something their child would have wanted or that is in keeping with their child’s character (e.g. giving or sharing). Families report they chose to donate because of the opportunity to save another child and because of a wish to prevent another family from going through an end-of-life experience.

Empowering the family may lessen the myths and misconceptions associated with the recovery of organs and tissues; for example, asking a family if they would like to witness some of the clinical and supportive tests for neurological death may be helpful. A family may also benefit from viewing the results of the cerebral blood flow study.

Should religion and culture be considered when discussing donation?
The family’s religious and cultural beliefs may be helpful areas to explore to understand how to best offer the opportunity to donate organs and tissues in a manner that is consistent with the family’s beliefs. Table 1 provides an overview of cultural and religious considerations. It is important to note that every family should be offered the opportunity to donate regardless of identified religion or culture as donation holds different meaning for individual families.

What information is shared with families about donation?
People choose to donate because it honours their beloved child’s life, helps other families and provides some comfort in an otherwise senseless situation. For this reason, information about the benefits of donation and how it helps grieving families and the recipients is always provided to the family first. In addition, families are also told how few people can donate organs at death and how rare the opportunity is to help others through organ donation.
The following information is also shared with families:

- A medical-social history interview with parents/guardians is required and includes questions about history of sexual relationships and alcohol and drug use, similar to those required with blood donation. These questions are asked regardless of the age of the child.
- Access to medical records is required to collect and clarify information.
- Blood samples are drawn and sent for testing for infectious diseases including HIV, Hepatitis B and C, and other diseases.
- Organ/tissue recovery usually occurs within 24–36 hours.
- With NDD, the child is taken to the OR while on mechanical ventilation.
- Organ recovery is similar to any other surgery and the body is treated with respect.
- On occasion, a transfer of the child’s body may be required for special organ testing or for recovering organs and tissues.
- Donation may not result in transplantation.

Final eligibility to transplant the donated organs and/or tissue occurs only after the medical-social history has been taken, serology test results for infectious diseases and organ function test results have been shared with the transplant teams, and organ appearance has been assessed in the OR.

What other information is provided to families in DCD situations?

The coordinators will discuss the interventions that will occur prior to the child’s death for the purposes of donation. These interventions pose minimal risk to the child, and will not be used or continued if there is any indication that death will be hastened as a result.

The following are interventions that may be performed:

- A trial period off the ventilator which predicts the timing of deterioration of the child’s vital signs after WLS.
- Testing and/or procedures similar to those performed in the case of NDD (e.g. serology for infectious diseases; blood type; organ-specific testing and evaluation, such as CXR or bronchoscopy).
- Medical management to stabilize the donor.
- Anticoagulants administered prior to death while the heart continues to beat to avoid clotting and ensure circulation and perfusion to all organs.
- Some hospital policies may also include femoral cannulation in anticipation of upcoming recovery in the OR.

Families sign a specific consent form regarding these DCD-specific interventions.

The TGLN coordinator will also discuss with the family the possibility that their child may not die within the timeframe that permits organ donation to occur. If this happens, the child will be returned to an appropriate area of the hospital where comfort measures will be continued.
What is the impact of donation on funeral arrangements?

- Rarely, recovery may delay the release of the child’s body to the funeral home and may influence timing of the funeral ceremony.
- Donation does not prevent cremation or open casket ceremony.
- Organ donation, heart-for-valve donation and musculoskeletal tissue donation may influence clothing for burial.
- Donation does not add any additional expense to the family’s estate and no profit is gained through the donation or transplantation.
<table>
<thead>
<tr>
<th>RELIGIOUS BELIEFS ABOUT DONATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hinduism</strong></td>
</tr>
<tr>
<td>• not prohibited from donating organs and tissues</td>
</tr>
<tr>
<td>• matter of individual choice</td>
</tr>
<tr>
<td><strong>Buddhism</strong></td>
</tr>
<tr>
<td>• no official position on organ donation</td>
</tr>
<tr>
<td>• matter of individual choice</td>
</tr>
<tr>
<td><strong>Sikhism</strong></td>
</tr>
<tr>
<td>• support a positive stance on organ and tissue donation</td>
</tr>
<tr>
<td><strong>Shinto</strong></td>
</tr>
<tr>
<td>• either clearly oppose/are extremely cautious regarding organ and tissue donation</td>
</tr>
<tr>
<td><strong>Confucianism</strong></td>
</tr>
<tr>
<td>• prohibited from damaging body as a whole</td>
</tr>
<tr>
<td><strong>Taoism</strong></td>
</tr>
<tr>
<td>• no objections to use of parts of body after death</td>
</tr>
<tr>
<td><strong>Judaism</strong></td>
</tr>
<tr>
<td>• all four branches of Judaism support and encourage organ and tissue donation</td>
</tr>
<tr>
<td>• general principle “saving of a human life takes precedence over all other laws”, including the delay in burial</td>
</tr>
<tr>
<td><strong>Islam</strong></td>
</tr>
<tr>
<td>• strongly believes in the principle of saving human life</td>
</tr>
<tr>
<td>• permit organ transplant as a priority in saving human lives</td>
</tr>
<tr>
<td><strong>Baptist</strong></td>
</tr>
<tr>
<td>• matter of individual choice</td>
</tr>
<tr>
<td><strong>Episcopal</strong></td>
</tr>
<tr>
<td>• encourage donation</td>
</tr>
<tr>
<td><strong>Greek Orthodox</strong></td>
</tr>
<tr>
<td>• support donation</td>
</tr>
<tr>
<td><strong>Lutheran</strong></td>
</tr>
<tr>
<td>• encourage donation</td>
</tr>
<tr>
<td><strong>Jehovah’s Witnesses</strong></td>
</tr>
<tr>
<td>• matter of individual choice</td>
</tr>
<tr>
<td>• all blood must be removed from organs prior to transplant</td>
</tr>
<tr>
<td><strong>Presbyterian</strong></td>
</tr>
<tr>
<td>• encourage and promote donation</td>
</tr>
<tr>
<td><strong>Catholicism</strong></td>
</tr>
<tr>
<td>• encourage donation as an act of charity</td>
</tr>
<tr>
<td><strong>Seventh Day Adventist</strong></td>
</tr>
<tr>
<td>• strongly encourage donation and transplantation</td>
</tr>
<tr>
<td><strong>United Church of Canada</strong></td>
</tr>
<tr>
<td>• support and encourage donation</td>
</tr>
<tr>
<td><strong>Protestantism</strong></td>
</tr>
<tr>
<td>• respect individual choice</td>
</tr>
</tbody>
</table>
Step 5

Screening and Testing
To promote successful transplantation and the health of each recipient, the risk of disease transmission through organ and/or tissue transplantation must be minimized and the potential donor’s medical and social history carefully assessed to determine medical suitability. Sources of data include the child’s hospital medical records, the professionals involved in his/her care at the hospital, and where necessary, past medical records. In accordance with Health Canada requirements, a **Donor Medical and Social History Questionnaire** is included in this assessment and data collection and involves an interview with the family or others who have a close relationship with the child who may be a potential donor. TGLN and the transplant teams rely on information provided by diagnostic tests and serology done on the child to make decisions about individual organ suitability for transplant.

**What are the essential elements of the combined organ/tissue donor assessment?**

The donor assessment includes but is not limited to the following:

- Complete head-to-toe physical examination for observation of tattoos, piercings, evidence of needle tracks, discoloration or sores on mucous membranes, swollen lymph nodes, masses and/or moles.
- Arterial blood pressure (ABP), central venous pressure (CVP), heart rate, temperature, urine output.
- Height, weight, chest circumference, abdominal girth.
- Ventilator settings.
- Documentation of sedation received.
- Blood pressure (BP) support (e.g. inotropes, vasopressors and antihypertensives).
- Intravenous (IV) fluids (type and rate).
- Other IV medications (type, dose and rate).

**What are the essential elements of tissue-exclusive donor assessment?**

The donor assessment includes but is not limited to the following:

- Complete head-to-toe physical examination for observation of tattoos, piercings, evidence of needle tracks, discoloration or sores on mucous membranes, and swollen lymph nodes, masses or moles.
- Height, weight.
- If intubated, length of time.
• Most recent white blood cell count (WBC), temperature, chest x-ray (CXR) and blood/urine/sputum culture results.
• Current medications (specifically antibiotics).
• Documentation of known sepsis.
• Assessment of any fluids received in the hour before death and any blood products or colloids within the last 48 hours prior to death.

What is the basic testing needed for organ donors**?

The donor assessment should include but is not limited to the following:

• ABO – Blood Group (Cross and Type)
• ABGs on ventilator setting of FiO₂ 1.0, PEEP 6–10 cmH₂O x 10 minutes post lung recruitment manoeuvres q2-4h
• CBC q4h
• Liver profile – Bilirubin (direct and indirect), AST, ALT, ALP, LDH, Total Protein, Albumin, Amylase, Lipase, GGT, PT/INR, PTT q4h
• Electrolytes, Creatinine, Urea, Glucose, Ca, PO₄, Mg, Lactate q4h
• CK, CK-MB q4-8h
• Troponin (I or T) q8h
• Urinalysis q24h
• Toxicology screen (blood or urine) unless overdose ruled out by MD
• C & S – sputum, urine and blood (include gram stain) q24h
• 12 lead EKG
• CXR q4h – with interpretation of both right and left sides.

** More frequent testing may be required based on individual cases.

What additional testing is needed for potential heart or lung donors?

• Bronchoscopy is considered for all potential lung donors. A second bronchoscopy will be performed in the OR if the lungs are accepted for recovery.
• 2D Echo – include assessment of left ventricular function/ejection fraction (EF), valve function, description of wall motion and function, evaluation of heart function.
• Coronary angiography may be requested by the transplant surgeon pending the 2D Echo results.

What tests are done to determine tissue matching between donors and recipients?

In addition to blood type considerations, histocompatibility, also referred to as HLA (Human Leukocyte Antigen) testing or tissue typing, is completed. This testing detects antigens (genetic markers) on white blood cells and is used to assess tissue compatibility between the donor and potential recipients. HLA is a critical factor in determining which patient is selected to receive a donated organ and reduce the potential for rejection after transplantation. The TGLN coordinator will advise what blood samples are needed.
What blood samples are needed for infectious disease testing?

To minimize the risk of disease transmission through organ or tissue transplantation, the donor’s blood is carefully screened for the presence of transmissible diseases. The information is used to help determine the medical suitability of organs and tissue. TGLN will advise what blood samples are needed and coordinate deliveries to appropriate labs.

According to the Health Canada Guidance Document, minimum serological testing for infectious diseases includes the following:

- HIV-1, HIV-2 (human immunodeficiency virus antibody);
- HBsAg (hepatitis B surface antigen);
- Total anti-HBc (hepatitis B core antibody);
- HCV (hepatitis C virus antibody);
- HTLV-1, HTLV-2 (Human T-cell lymphotropic virus);
- Syphilis (RPR);
- Antibody to cytomegalovirus – IgG (CMV);
- West Nile Virus.

The results of these tests are received by TGLN prior to transplantation of the organ and usually required prior to the donor recovery surgery.

In addition to the tests specified above, donors are tested for:

- Toxoplasmosis for heart donors
- Epstein-Barr virus (EBV).

To address the possible vertical transmission (mother to child) of infectious agents in donors under 18 months of age, or who have been breast fed within the past 12 months, the serology of the birth mother is also tested.

What is involved in the hemodilution screening process?

Prior to drawing blood specimens for infectious disease testing, the hemodilution status of the donor must be established. This “Hemodilution Screen” calculates the amount of intravenous fluids the child has received in the past 48 hours. This is done to ensure accuracy of testing for the infectious disease markers.

Prior to the time serology samples are drawn, the following information will be needed:

- Red cell product volume within 48 hours prior to the draw.
- Colloids (e.g. plasma, albumin, dextran, pentaspan, voluven, platelets, cryoprecipitate or TPN) in the 48 hours prior to serology draw.
- Crystalloid volume given in the one hour prior to serology draw.

The TGLN coordinator will help complete the calculation for the hemodilution screen.

If a sample is determined to be hemodiluted and there was a sample drawn prior to the child receiving multiple infusions, there may be a need to obtain this sample (pending permission of the Coroner if considered a Coroner's case).
What other steps are involved in screening for medical suitability and infectious diseases?

The child’s medical-social history is critical in identifying the risk versus benefit for a potential transplant recipient. TGLN staff will complete a medical-social questionnaire interview with the appropriate individuals.

Information gathered through the questionnaire:

- Assists in screening for the transmission of bacterial, viral and prion-associated diseases (e.g. Creutzfeldt-Jakob disease or CJD) that may be transmitted through transplantation.
- Identifies evidence of conditions or diseases that may make donation unsuitable.
- Identifies donors with activities that are considered high-risk for infectious disease transmission.
- Identifies those who may be genetically predisposed to certain diseases that may preclude donation.
- Identifies if maternal serology may be necessary for a paediatric donor by asking if the child has been breastfed in the past 12 months.

Final acceptance of organs and tissues for transplantation rests with the receiving transplant surgeons or tissue banks.
Step 6
Donor Management
**Step 6: Donor Management**

Preserving the opportunity to donate is an important part of end-of-life care and involves a collaborative effort between healthcare providers and TGLN. Many hospitals have developed standing orders or pre-printed order sets that are initiated when the child meets hospital-specific clinical triggers/referral indicators to TGLN. Optimal donor management ensures the child’s family is offered the opportunity to donate when substitute consent is required, and facilitates donor stability in order to act on a registered donation consent decision if the child is over 16 years of age and registered. Finally, comprehensive donor management promotes the best outcome for the potential recipients.

Optimal management can improve organ function. Myocardial/cardiovascular dysfunction, oxygenation impairment related to reversible lung injury, invasive bacterial infections, hypernatremia and any other imbalances can be treated with active donor management. It is important to take the time needed in an ED or ICU to optimize multi-organ function for the purposes of improving transplant outcomes and helping as many recipients as possible. TGLN follows the recommendations for donor management set out by the CCDT, and best medical practices for critically ill children.

- The management period may range from 12–36 hours.
- The CCDT states there are no predefined demographic factors or organ dysfunction thresholds that preclude the consent for donation and offering of organs for transplantation.
- Technology has advanced. It is now possible to maintain or improve organ function after recovery and prior to transplant with organs like kidneys and lungs thus expanding the number of organs that can be transplanted from one donor.
- The assessment for donation opportunity via a referral to TGLN should always precede actual intervention for WLS if the child is mechanically ventilated.

A one page *Quick Reference Chart* is located at the end of this section.

**What are the goals of donor management?**

To ensure the family has the opportunity to consider donation and to help the most number of recipients possible, the goals of donor management are to ensure physiological homeostasis in order to maintain optimal organ function at the time of surgical recovery. This includes hemodynamic, ventilatory, fluid, electrolyte, and endocrine management to maintain:

- Euvolemia (normovolemia)
- Hemodynamic stability
- Normothermia
Prior to and following consent when DCD is planned for organ donation, optimum management (employing the same goals as above) continues until the time of WLS treatment.

The TGLN Donation Support Physicians (DSPs) are available 24/7 for consultation regarding donor management issues that are unresponsive to the interventions identified in this section.

What are the monitoring guidelines for donor management?

- Vital signs q1h
- Temperature q4h (warming/cooling blanket to maintain temperature at 36–37 °C)
- Continuous pulse oximetry and cardiac monitoring
- Arterial line pressure q1h
- Central venous pressure (CVP) monitoring q1h
- Urine catheter to straight drainage, hourly intake and output
- Nasogastric tube to straight drainage
- Initiate or continue enteral feedings, when appropriate and possible
- Infectious disease assessment (via q24h blood, urine, and sputum cultures)

Hemodynamic Monitoring and Therapy

Hypovolemia is the most common cause of hypotension and will result in inadequate tissue perfusion/ischemic damage to the organs. The goal is to return arterial blood pressure to general target ranges to provide adequate organ perfusion (age-related norms provided below).

Maintaining hemodynamic status within the following target ranges is suggested:

- Age-related norms for pulse and blood pressure
- Normovolemia, CVP 6–10 mmHg

<table>
<thead>
<tr>
<th>Age</th>
<th>Heart Rate beats/min</th>
<th>Systolic BP mmHg</th>
<th>Diastolic BP mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>120–160</td>
<td>50–70</td>
<td>25–45</td>
</tr>
<tr>
<td>0–3 mos</td>
<td>100–150</td>
<td>65–85</td>
<td>45–55</td>
</tr>
<tr>
<td>3–6 mos</td>
<td>90–120</td>
<td>70–90</td>
<td>50–65</td>
</tr>
<tr>
<td>6–12 mos</td>
<td>80–120</td>
<td>80–110</td>
<td>55–65</td>
</tr>
<tr>
<td>1–3 yrs</td>
<td>70–110</td>
<td>90–105</td>
<td>55–70</td>
</tr>
<tr>
<td>3–6 yrs</td>
<td>65–110</td>
<td>95–110</td>
<td>60–75</td>
</tr>
<tr>
<td>6–12 yrs</td>
<td>60–95</td>
<td>100–120</td>
<td>60–75</td>
</tr>
<tr>
<td>&gt;12 yrs</td>
<td>55–85</td>
<td>110–135</td>
<td>65–85</td>
</tr>
</tbody>
</table>
Unless otherwise indicated, doses follow CCDT guidelines which advise dosing recommendations apply to children ≤60 kg, beyond which adult dosing should apply.

### Suggested Donor Management Guidelines

<table>
<thead>
<tr>
<th>Condition</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>↓ SBP (below target range) and CVP &lt; 6 mmHg</strong></td>
<td>- IV Bolus Normal Saline 10–20 cc/kg over 15 minutes &lt;br&gt;- MD to reassess</td>
</tr>
<tr>
<td><strong>↓ SBP (below target range) and CVP ≥ 6 mmHg (or fluid bolus ineffective)</strong></td>
<td><strong>Support agents (listed in order of recommended initiation)</strong>&lt;br&gt;<strong>1st line support agents:</strong>&lt;br&gt;- Dopamine infusion&lt;br&gt;  • IV infusion for standard cardiovascular support to a max. of 10 mcg/kg/min &lt;br&gt;  • If HR &gt; target value consider alternate therapy&lt;br&gt;- Vasopressin infusion&lt;br&gt;  • IV 0.0003–0.0007 U/kg/min to a max. of 0.002 U/kg/min&lt;br&gt;<strong>2nd line support agents</strong>&lt;br&gt;- IV infusion when unresponsive to above interventions&lt;br&gt;- Norepinephrine infusion 0.01–0.5 mcg/kg/min&lt;br&gt;- Epinephrine infusion 0.01–1 mcg/kg/min&lt;br&gt;- Phenylephrine infusion 0.01–0.5 mcg/kg/min</td>
</tr>
<tr>
<td><strong>↑ SBP</strong></td>
<td><strong>Age related treatment thresholds for arterial hypertension:</strong>&lt;br&gt;  - Newborn–3 mos &gt;90/60 &lt;br&gt;  - &gt;3 mos–1 yr &gt;110/70 &lt;br&gt;  - &gt;1 yr–12 yrs &gt;130/80 &lt;br&gt;  - &gt;12 yrs &gt;140/90</td>
</tr>
</tbody>
</table>

### Other cardiovascular considerations
- 12 lead EKG daily
- Continuous monitoring (as stated above)
- Transthoracic echocardiogram (2D Echo) unless cardiac donation ruled out by TGLN
**Fluid, electrolyte and endocrine considerations**

As electrolyte levels impact the ability to declare death by neurological criteria, strict attention should be paid to management. Potentially confounding factors that might prevent the observation of neurologic responses and/or mimic death might include hypophosphatemia (<0.4 mmol/L) and hypernatremia (>160 mmol/L).

IV fluids to maintain normovolemia with:

- Serum sodium (Na) 130–150 mmol/L
- Blood glucose 6–10 mmol/L
- Normal ranges for potassium, calcium, magnesium, and phosphate
- Urine output 0.5–3 mL/kg/hr
- If urine output <0.5 mL/kg/hr x 2 hrs, consider fluid bolus

<table>
<thead>
<tr>
<th>Suggested Donor Management Guidelines</th>
</tr>
</thead>
</table>
| **If urine output > 4 mL/kg/hr with serum Na ≥ 145 mmol/L and/or serum osmolarity ≥ 300 mOsm and/or urine osmolarity ≤ 200 mOsm** | Treat as Diabetes Insipidus  
- Titrate therapy to urine output ≤3 mL/kg/hr  
- IV maintenance bolus to maintain CVP of 6–10 mmHg  
Suggest:  
If SBP within target range  
- DDAVP 0.25–1 mcg IV (max. 4 mcg) q6h prn  
If SBP < target range or on vasopressors;  
- Vasopressin infusion IV 0.0005–0.010 U/kg/hr, (max. 0.002 U/kg/min). (note dose different from hypotension therapy – U/kg/hr versus U/kg/min) |
| **Blood Glucose > 10 mmol/L** | Initiate standard sliding scale for glucose control |
| **Blood Glucose < 6 mmol/L** | Consider IV dextrose infusion |
| **Hypernatremia Na ≥ 145mmol/L** | Consider changing maintenance IV to 0.45 % saline (or D5 0.45% saline) |
| **Hyponatremia Na ≤ 135mmol/L** | Consider changing maintenance IV to 0.9% saline |
| **Electrolyte Deficiency e.g. Ca, Mg, K, PO₄** | Consider electrolyte replacement or implement electrolyte replacement order set  
Suggest q4h monitoring  
Observe for upward/downward trends |
| **Ca (ionized) < 1.1 mmol/L** | Calcium gluconate IV 50mg/kg (max 3g) |
| **Mg < 0.80 mmol/L** | Magnesium sulphate IV 50 mg/kg (max 2.5g/dose) |
| **K < 3.7 mmol/L** | Potassium chloride IV 0.5 mmol/kg (max 60 mmol) over 2 hours  
*Via central venous line only – according to hospital policy |
| **PO₄ < 0.80 mmol/L** | Phosphate replacement equalling 0.332 mmol phosphate/kg over 4h |
Respiratory considerations

In addition to the following management guidelines, a request will typically be made for a documented bronchoscopy with sputum sample collected for culture and sensitivity.

<table>
<thead>
<tr>
<th>Suggested Donor Management Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ventilation settings to maintain arterial blood gases as follows:</strong></td>
</tr>
<tr>
<td>SaO2 ≥ 95%</td>
</tr>
<tr>
<td>pH 7.35–7.45 mmHg</td>
</tr>
<tr>
<td>PaO2 ≥ 80 mmHg</td>
</tr>
<tr>
<td>PaCO2 35–45 mmHg</td>
</tr>
<tr>
<td><strong>Mechanical Ventilation Targets</strong></td>
</tr>
<tr>
<td>• Vt 6–8 mL/kg</td>
</tr>
<tr>
<td>• PEEP 6–10 cmH2O</td>
</tr>
<tr>
<td>• PIP ≤ 30 cmH2O</td>
</tr>
<tr>
<td><strong>Maintenance Considerations</strong></td>
</tr>
<tr>
<td>• Suction &amp; routine physiotherapy q2h &amp; prn</td>
</tr>
<tr>
<td>• Frequent repositioning q2h &amp; prn</td>
</tr>
<tr>
<td>• Head of bed to be elevated 30–45o</td>
</tr>
<tr>
<td>• CXR q4h and prn</td>
</tr>
<tr>
<td>• Salbutamol &amp; Ipratropium 1–2 puffs each q4h + q2h prn for wheezing</td>
</tr>
<tr>
<td>• Methylprednisolone 15 mg/kg IV (max. 1g) q24h for all potential lung donors</td>
</tr>
<tr>
<td><strong>Alveolar Recruitment Manoeuvres</strong></td>
</tr>
<tr>
<td>For all potential lung donors:</td>
</tr>
<tr>
<td>• Change ventilation settings 10 minutes prior to drawing ABG’s</td>
</tr>
<tr>
<td>• With assistance from the respiratory therapist initiate sustained inflation PEEP of 30 cm H2O for 30 seconds with FiO2 at 100%</td>
</tr>
<tr>
<td>• Maintain FiO2 100% - wait 10 minutes and draw ABG</td>
</tr>
<tr>
<td>• Obtain CXR after each recruitment</td>
</tr>
<tr>
<td>• Repeat q2-4h and prn as requested by transplant team (as tolerated)</td>
</tr>
<tr>
<td>• Return to regular FiO2 and ventilator parameters</td>
</tr>
<tr>
<td><strong>Arterial Blood Gases</strong></td>
</tr>
<tr>
<td>Increase FiO2 to 100% with minimum PEEP of 6–10 cmH2O for 10 minutes prior to drawing all blood gases</td>
</tr>
<tr>
<td>• maintain rate</td>
</tr>
<tr>
<td>• return FiO2 to previous settings once completed</td>
</tr>
<tr>
<td>• Repeat q2-4h and as requested by transplant team for all lung donors</td>
</tr>
</tbody>
</table>

Thermoregulation considerations

Hypothermia can result in myocardial depression, hypoxemia and acidosis. Cooler body temperature may impact clinical testing for neurological death, and can prolong the time required for apnea tests due to the decreased amount of CO2 produced by the body.
**Transfusion Considerations**

**Blood Products**

- **Packed Red Blood Cells**
  - Use restricted to restoration of blood loss situations
  - Used to replenish low hematocrit which may lead to decreased O₂ availability to vital organs

<table>
<thead>
<tr>
<th>Suggested Donor Management Guidelines</th>
</tr>
</thead>
</table>
| **Hypothermia:** (temperature < 36°C) | • Warming Blanket
| **Note:** temperature considerations apply for valid clinical examination of NDD* | May also require:
| | - Warming inspiratory gases
| | - Warming IV fluids

*S minimum temperature must be ≥36°C for newborns (>36 weeks gestation and <30 days corrected gestational age) and ≥34°C for all other children

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The TGLN DSPs are available 24/7 for consultation regarding donor management issues that are unresponsive to any of the above interventions.

**How is donor management different for DCD donors?**

The goals of donor management remain the same in DCD: the preservation of euvoemia, hemodynamic stability and normothermia.

The main differences with DCD cases include the following:

1. Donor support continues until WLS (this continues to recovery in NDD).
2. L-thyroxine is not necessary (currently, recovery of the heart for solid organ transplant does not occur with DCD donors).
3. At the time of WLS, anticoagulation therapy may be administered to the donor at the request of the transplant team.
**QUICK REFERENCE CHART: DONOR MANAGEMENT TARGETS AND INTERVENTIONS**

### Respiratory
- SaO₂ > 95%
- PaO₂ > 80 mmHg
- PaCO₂ 35-45 mmHg
- pH 7.35-7.45 mmHg

### Cardiovascular
- HR age-related targets
- CVP 6-10 mmHg
- BP age-related systolic and pulse BP targets

- If no results and SBP continues ↓ and CVP ≥ 6 mmHg:
  - **Primary Pressors**:
    - Dopamine ≤ 10 mcg/kg/min
    - Vasopressin infusion IV 0.0003-0.0007 U/kg/min (max 0.002 U/kg/min)

- **Secondary Pressors**
  - Norepinephrine 0.01-0.5 mcg/kg/min
  - Epinephrine 0.01-1 mcg/kg/min
  - Phenylephrine 0.01-0.5 mcg/kg/min

### Endocrine
- Blood Sugar (BS) target: 6-10 mmol/L

### Renal
- Urine Output (u/o) target: 0.5-3 ml/kg/hr

### Maintenance of electrolytes within normal ranges

- If SBP < age-related target and CVP < 6 mmHg
  - Consider fluid bolus
  - Fluid choice based on serum Na

- If SBP > age-related target
  - Wean pressors
  - Consider Nitroprusside or short-acting beta blockers e.g. Esmolol

- If BS > 10 mmol/L
  - Consider Insulin according to hospital protocol

- If BS < 6 mmol/L
  - Consider dextrose solutions or tailoring IV fluids to ↑

- If u/o < 0.05 ml/kg/hr x 2h
  - Consider fluid bolus

- If u/o > 4 ml/kg/hr & serum Na > 145 mmol/L &/or ↓ urine osmole treat for Diabetes Insipidus (D.I.)

- If u/o > 4 ml/kg/hr & serum Na > 145 mmol/L consider 0.9% NS or D5 0.45% NS

### Thyroid Hormone
- NDD donors only
- Solumedrol: all donors
- **Note**: Vasopressin dose different for BP support vs D.I. treatment

- If SBP < age-related target or on vasopressors:
  - Consider Vasopressin infusion IV 0.0005-0.010 U/kg/hr

- If SBP within age-related target:
  - Consider DDAVP 0.25-1 mcg (max 4 mcg) q6h prn

- If SBP < age-related target or on vasopressors:
  - Consider Vasopressin infusion IV 0.0005-0.010 U/kg/hr

- If Na < 135 mmol/L consider 0.9% NS or D5 0.45% NS

- If Na > 145 mmol/L consider 0.45% NS or D5 0.45% NS

- **Note**: Vasopressin dose different for BP support vs D.I. treatment
Step 7
Organ and Tissue Recovery Planning
Recovery of organs and tissues almost always occurs in the hospital in which the donor is located as transfer increases the time required to complete the donation process. For families, this additional time, and the thought of sending their child’s body to an unfamiliar hospital, may be difficult.

TGLN coordinates the exact timing of organ and tissue recovery with the healthcare team, including the OR, as well as the transplant teams and tissue banks.

**What planning is needed for onsite recovery?**

The recovery personnel may vary depending on the specific organs or tissues that are being recovered. Typically, a recovery may start 12–36 hours after consent has been obtained; however, this can vary significantly depending on donor stability, geographic region and the number of organs to be recovered. TGLN is committed to helping the greatest number of people possible. There are a significant number of considerations for planning the recovery including the following:

- OR time is scheduled in partnership with the hospital’s OR staff, TGLN’s Provincial Resource Centre and the transplant program’s recovery surgeons.
- Complexity of the allocation of individual organs and tissues because of blood type or other matching factors may require additional time prior to OR.
- Other organ recovery surgeries may be in process and the transplant teams or TGLN surgical recovery staff may be involved.
- Timing of the results of infectious disease tests (typically required prior to starting OR recovery).
- Organization of temporary surgical privileges as per individual hospital policy.

The names and credentials for recovery staff may be accessed via TGLN’s Provincial Resource Centre.

Normally, the facility and staff resources in the OR are booked using the same process as that for other urgent surgeries. TGLN recommends that the hospital classify recovery surgeries as high priority. The hospital may need additional steps or approvals to address circumstances in which a requested booking for an organ recovery surgery conflicts with another planned surgery.

In situations where the recovery involves non-perfused tissue exclusively, the child’s body should be transported to the morgue until tissue recovery teams have arrived. This helps to preserve tissue integrity. The Provincial Resource Centre may fax a *TGLN Hold the Body form* to the relevant personnel (e.g. specific unit, Admitting Department, Medical Records, Morgue, etc.) to ensure that the body is not transferred out of the hospital until the family’s request for tissue recovery has been facilitated.
What documentation is needed for onsite recovery?

- The child’s identification band.
- Hospital card (medical record number).
- TGLN or hospital-specific Consent for Organ and/or Tissue Donation and, in addition for DCD recoveries, Consent for Pre-mortem Intervention.
- Medical Certificate of Death
- Coroner’s Permission form (if applicable)
- If patient was pronounced by NDD, documentation of NDD exams (ensure two (2) physician signatures are clearly identified).
- Results of ancillary testing (if required to pronounce NDD).
- Any additional documentation specific to the OR at recovery hospital.
- Completed hospital pre-op checklist (most items will not be applicable when the child has been declared by neurological criteria).
- The Declaration of Death: Organ Donation after Cardio-Circulatory Death form (for DCD cases).

How are special requests from the family or Coroner noted?

Verbal communication of any special requests should be communicated to the TGLN coordinator and the TGLN Provincial Resource Centre. In addition, special requests are noted in two places:

1. TGLN consent form

   The organ and tissue donation coordinator (OTDC), or person obtaining consent, will document any special request by family regarding care of the body during or following the recovery surgery (e.g. an item such as a blanket or favourite stuffed toy to accompany the child to the OR). These types of requests should be noted on the appropriate section of the consent form.

   Coroner directions can also be documented on the consent form.

2. TGLN medical-social questionnaire

   Any special family requests should also be recorded on this document and communicated as above.

What surgical resources are needed for organ or tissue recovery?

<table>
<thead>
<tr>
<th>Organ or Combined Organ and Tissue</th>
<th>Tissue Exclusively</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Large operating room</td>
<td>• Operating room</td>
</tr>
<tr>
<td>• Surgical instruments and supplies (see recovery checklist)</td>
<td>• Surgical supplies (see recovery checklist)</td>
</tr>
<tr>
<td></td>
<td>• Enucleator protocols are site specific</td>
</tr>
</tbody>
</table>

See also Tables 4 and 5 – Surgical Recovery Checklist for Equipment and Supplies
What hospital staff resources are needed for organ or tissue recovery?

<table>
<thead>
<tr>
<th>Organ or Combined Organ and Tissue</th>
<th>Tissue Exclusively</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Anesthetist*: initial 2–4 hours</td>
<td>• Circulating nurse: available upon request from tissue recovery personnel (not required if only ocular tissue is to be recovered)</td>
</tr>
<tr>
<td>• Scrub nurse: duration of organ recovery</td>
<td></td>
</tr>
<tr>
<td>• Circulating nurse: for duration of organ and tissue recovery</td>
<td></td>
</tr>
</tbody>
</table>

* For DCD cases, an anesthetist or an RT may be required if lungs are being recovered

How long does surgical recovery of organs and tissues take?

<table>
<thead>
<tr>
<th>Organ or Combined Organ and Tissue</th>
<th>Tissue Exclusively</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Organ recovery: 3–7 hours</td>
<td>• Tissue recovery: 3–7 hours</td>
</tr>
<tr>
<td>• Approximate depending on which organs/tissues are being recovered</td>
<td>• Approximate depending on which tissues are being recovered</td>
</tr>
<tr>
<td>• Tissue recovery (excluding ocular tissue): additional 3–7 hours</td>
<td>• Corneas/eyes will be recovered within 12 hours after death if suitable for transplant. This is dependant on availability of the enucleator</td>
</tr>
</tbody>
</table>

What happens if onsite recovery is not possible?

In the rare event that onsite recovery is not feasible, a TGLN coordinator will assist in organizing the transfer to a facility that can provide the required recovery services. The following documentation should be sent with the donor:

- **Coroner/Forensic Pathologist Permission form** (if applicable)
- TGLN or hospital-specific **Consent for Organ and/or Tissue Donation** (including consent to transfer for recovery and, in addition for DCD recoveries: **Consent for Pre-mortem Intervention**).
- If the child was pronounced by NDD, documentation of NDD exams (ensure two (2) physician signatures are clearly identified) and ancillary test results if required to complete the declaration.
- Copy of the child’s hospital medical record; specifically:
  - Medication records
  - NDD form or notes
  - Copy of CT scan/cerebral perfusion scan/angiography images
  - ABO documentation
  - Nursing records
  - Additional organ-specific testing results.
How does the organ recovery process proceed in NDD and DCD?
See Table 2 and 3 – Surgical Recovery Procedure.

What after-recovery care is needed for the child’s body?
Care of the child’s body after completion of the recovery surgery is generally the same as for routine care after death (e.g. ensure body is clean and dry, close eyes, etc.). There may, however, be specific instructions from the Coroner regarding preparation of the child’s body for release that require consideration. A TGLN staff will ensure the OR staff is informed of any special considerations in advance of the surgery.

What is the best way to support the family during the recovery surgery?
Some families choose to leave the hospital prior to recovery; others may elect to stay. Hospital staff may offer the family the opportunity to view or possibly hold their child’s body following recovery. They may also wish to participate in the after care of their child’s body such as bathing and dressing. If the family has identified a funeral home, a TGLN representative can liaise with this facility regarding timing for release of the body.

Table 2

NDD SURGICAL RECOVERY PROCEDURE

A multi-organ recovery is a sterile surgical procedure. Recovery teams can spend more than six hours carefully removing organs. There may be as many as four surgical teams, with each team recovering a different organ. All members of the team are responsible for ensuring the body is treated with respect at all times during the procedure.

The anesthetist is responsible for intraoperative donor maintenance as well as the administration of neuromuscular blocking agents which should be used to facilitate surgical exposure and to avoid neuromuscular (spinal) reflexes during the procedure.

The donor should be placed in a supine position on the surgical table with both arms abducted. Surgical preparation and draping will include the abdomen and thoracic regions. Generally the liver recovery team is responsible for this initial preparation (with the assistance of the OR nursing team). An extensive midline incision is made from the suprasternal notch to the symphysis pubis. The sternum is split, even if the heart and lungs are not to be recovered. This is to aid in visualization and facilitates easier access to the abdominal organs. Liver dissection usually takes from two to three hours, during which time it is not uncommon to have hemodynamic fluctuations due to compression of the inferior vena cava (IVC) and manipulation of the adrenal glands. The timing of the dissection varies depending on the experience of the surgeon.

Once dissection is complete, Heparin 300 units/kg must be administered. Ensure any necessary blood sampling has been obtained at this point. Heart dissection begins as the cardiac surgeon dissects around the superior vena cava (SVC) and IVC; minimal dissection is also completed around the distal ascending aorta to facilitate cross-clamping. At this time, cooperation and coordination is required by all teams to ensure perfusion solutions are ready to infuse and sterile slush is ready to initiate cold ischemia. Cannulation of the ascending aorta to prepare for perfusion of cardioplegia or celsor solution is completed at this time.

Continued...
Cannulation of the pulmonary artery and preparation of Perfadex lung perfusion solution is the next step in the recovery process. The liver team then cannulates the portal vein and abdominal aorta. The teams negotiate cross-clamp timing when all cannulas are in place. Lungs are inflated at this point to avoid atelectasis (if lungs are being recovered). Cross clamp aorta (continue ventilation if lungs are donated). At this time the aorta is cross-clamped and perfusion commences using organ-specific solution (usually about two to three hours into the procedure). Prepared ice-cold solutions, which are used to flush the organs, serve two purposes: the organ is flushed free of any blood and the organ temperature is lowered which helps to preserve the organ. Cooling acts as a metabolic brake, reducing the oxygen requirements of the organ to near zero while it is transported to the recipient’s hospital. This represents the start of the cold ischemic period. Once organ perfusion is completed, the organs are removed in order starting with the heart, lungs which are dissected free and the trachea clamped with the lungs in the inflated state. Ventilation is discontinued only after the trachea has been clamped. The liver, pancreas and/or bowel with kidneys are the last organs recovered. The organs are then packed in more cold solution and placed in a cooler full of ice to be delivered to the recipient transplant OR. In addition to the above, specimen management is also crucial to successful transplantation outcomes. The recovery of spleen, blood for archiving and occasionally biopsies, are also part of the process.

Special considerations are required for the recovery of donated tissues. Region-specific bone banks are responsible for musculoskeletal tissue recovery. The clinical service coordinator in the Provincial Resource Centre is responsible for facilitating the recovery process of donated tissue with the tissue banks (see tissue donation process). If bones are being recovered, an additional three hours is required; skin recovery adds an additional three hours for a total recovery period of 10 to 12 hours for a multi-organ/tissue recovery process. The organ recovery team may recover heart valves.

### Table 3

<table>
<thead>
<tr>
<th>DCD SURGICAL RECOVERY PROCEDURE</th>
</tr>
</thead>
</table>

DCD recovery cases happen at a much faster pace to minimize the effect of decreased perfusion to organs during the process of dying. Operating room nurses have compared the DCD recovery pace to that of a ruptured ascending aortic aneurysm (AAA) repair surgery.

The donor should be placed in a supine position on the surgical table with both arms abducted or tucked depending on surgical preference. Surgical preparation and draping occurs in a rapid sequence and will include the abdomen and thoracic regions.

A midline incision is made to expose the intra-abdominal and intrathoracic organs. The aorta is clamped, perfusion begins and crushed ice is placed on the liver and kidneys. If lungs are being recovered, reintubation and bronchoscopy typically occurs around the same time as the prep. Once bronchoscopy has determined no signs of aspiration are present, ventilation is started. Hypothermia of the lung bloc is established. The heart is elevated out of the pericardial sac and the lung bloc is removed, and placed in cold Perfadex solution within sterile containers for transport.

Further irrigation and dissection takes place. The liver is the first abdominal organ to be recovered followed by the pancreas. Kidneys are dissected along with the renal vessels and placed on a sterile back table for further examination to exclude abnormal pathology.

Considerations for tissue are consistent with tissue recovery post NDD as explained in Table 2.

Source: TGLN Online Resource Centre – DCD Operative notes.
### Table 4

**ORGAN RECOVERY EQUIPMENT CHECKLIST**

<table>
<thead>
<tr>
<th><strong>Equipment for Room Set-up</strong></th>
<th><strong>Drugs</strong></th>
<th><strong>Sutures</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Large volume suction apparatus (~16 litres)</td>
<td>✓ Heparin 1:1000</td>
<td>✓ Bone Wax (x2)</td>
</tr>
<tr>
<td>✓ Small tables (x2)</td>
<td>✓ Lasix</td>
<td>✓ Ligaclip large (x1)</td>
</tr>
<tr>
<td>✓ High stands</td>
<td>✓ Neuromuscular blocking agents</td>
<td>✓ Ligaclip medium (x1)</td>
</tr>
<tr>
<td>✓ IV poles (x2)</td>
<td>✓ Mannitol (20% – 100 cc)</td>
<td>✓ Umbilical tape (x2)</td>
</tr>
<tr>
<td>✓ Blood warmer</td>
<td>✓ 1-4 units packed red blood cells (check with TGLN coordinator)</td>
<td>✓ Silk 3-0 (x2)</td>
</tr>
<tr>
<td>✓ Bovie (x2)</td>
<td>✓ Bone Wax (x2)</td>
<td>✓ Silk 0 (x2)</td>
</tr>
<tr>
<td>✓ Nitrogen tank</td>
<td>✓ Ligaclip medium (x1)</td>
<td>✓ Silk ties 0 (x2)</td>
</tr>
<tr>
<td>✓ Gerhardt table</td>
<td>✓ Umbilical tape (x2)</td>
<td>✓ Silk ties 2 (x1)</td>
</tr>
<tr>
<td>✓ Ring stands</td>
<td>✓ Silk 3-0 (x2)</td>
<td>✓ Silk ties 3-0 (x2)</td>
</tr>
<tr>
<td>✓ Slush machine (if available)</td>
<td>✓ Bone Wax (x2)</td>
<td>✓ Silk ties 2-0 (x2)</td>
</tr>
<tr>
<td>✓ Flexible bronchoscope (if recovering lungs)</td>
<td>✓ Bone Wax (x2)</td>
<td>✓ Vicryl 2-0 Reel (x1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>✓ <strong>Equipment</strong></th>
<th>✓ <strong>Equipment</strong></th>
<th>✓ <strong>Equipment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong># Qty</strong></td>
<td><strong># Qty</strong></td>
<td><strong># Qty</strong></td>
</tr>
<tr>
<td>Major abdominal tray</td>
<td>Tubing smoke evacuator w/ adaptor (standard)</td>
<td>1</td>
</tr>
<tr>
<td>Sternal or oscillating saw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Prep tray</td>
<td>Tubing – IV administration</td>
<td>2</td>
</tr>
<tr>
<td>Basic basin set</td>
<td>Sponge – tonsil single strung (Raytec pushers)</td>
<td>1</td>
</tr>
<tr>
<td>ENT basins</td>
<td>Sponge – cylindrical dbi.strung</td>
<td>1</td>
</tr>
<tr>
<td>Deep sharp Balfour retractor and blade</td>
<td>Opsite (45 cm x 55 cm)</td>
<td>4</td>
</tr>
<tr>
<td>Gibson retractor</td>
<td>Sponge – laparotomy (12x12)</td>
<td>20</td>
</tr>
<tr>
<td>Draping – CV pack</td>
<td>Cautery tip – blade 1</td>
<td>2</td>
</tr>
<tr>
<td>Gown single – gortex</td>
<td>Cautery tip – blade 6</td>
<td>1</td>
</tr>
<tr>
<td>Gown bundle (3/pk) – gortex</td>
<td>Cautery pencil electroswitch</td>
<td>2</td>
</tr>
<tr>
<td>Drape – overhead table cover</td>
<td>Cautery holder</td>
<td>1</td>
</tr>
<tr>
<td>Cover – table (50x90)</td>
<td>Fogarty clamp inserts</td>
<td>1</td>
</tr>
<tr>
<td>Towel – green (6/pk)</td>
<td>Needle counter</td>
<td>2</td>
</tr>
<tr>
<td>Pack – universal</td>
<td>Suction tip – hi-capacity</td>
<td>2</td>
</tr>
<tr>
<td>Towel – adhesive</td>
<td>Suction tip – low capacity</td>
<td>1</td>
</tr>
<tr>
<td>#20 blade</td>
<td>Suture boots mini cartridge (3 pr)</td>
<td>1</td>
</tr>
<tr>
<td>#15 blade</td>
<td>Syringe – 60 ml irrigation bulb</td>
<td>1</td>
</tr>
<tr>
<td>Yankauer suction</td>
<td>Suction tip – Poole</td>
<td>1</td>
</tr>
</tbody>
</table>

*Continued...*
<table>
<thead>
<tr>
<th>✓ Equipment</th>
<th># Qty</th>
<th>✓ Equipment</th>
<th># Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubing – suction</td>
<td>2</td>
<td>Clip Appliers – medium 10.5”</td>
<td>2</td>
</tr>
<tr>
<td>Electro tip cleaner</td>
<td>1</td>
<td>Clip Appliers – large 10.5”</td>
<td>2</td>
</tr>
<tr>
<td>Vessel loops – blue mini</td>
<td>1</td>
<td>Retractor – chest medium (square hole)</td>
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<td>Vessel loops – yellow maxi</td>
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<td>Forceps – Swedish Debakey 11”</td>
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<td>Bottle suction liner with cap 3000cc</td>
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<td>Forceps – Allis 9”</td>
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<td>Staple – skin TW-35</td>
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<td>Forceps – Fraser straight 7.25”</td>
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<td>Asepto syringe</td>
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<td>Forceps – Fraser curved 7.25”</td>
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<td>Pickups – Debakey medium 12”</td>
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<td>Forceps – Fogarty Hydragrip curved 8.75”</td>
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<td>Pickups – Debakey insulated medium 8”</td>
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<td>Forceps – Lee bronchus 9.25”</td>
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<td>Pickup – Pott Smith</td>
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<td>Forceps – Semb dissector 9.25”</td>
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<td>Bulldogs – Cross Action 1.25”</td>
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<td>Forceps – Satinsky medium 10”</td>
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<td>Rummel rods 12” (1 large, 1 small)</td>
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<td>Forceps – Debakey regular 7”</td>
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<td>Retractor Alar 6”</td>
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<td>Scissor – Mayo straight 6.75”</td>
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<tr>
<td>Retractor Alar 10”</td>
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<td>Scissor – Metzenbaum 9”</td>
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<td>Tourniquets (4 large, 2 small)</td>
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<td>Needle holder – arterial 7”</td>
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<tr>
<td>Scalpel handle #4</td>
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<td>Needle holder – Mayo Hegar 7”</td>
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<th>✓ Equipment</th>
<th># Qty</th>
<th>✓ Equipment</th>
<th># Qty</th>
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<td>✓ Nitrogen tank</td>
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<td>✓ Tevdek #5 (8)</td>
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<td>✓ Betadine-bottles (x2)</td>
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<th>✓ Equipment</th>
<th># Qty</th>
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<th># Qty</th>
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<tr>
<td>Major orthopedic tray</td>
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<td>Sponge – 4x4, box</td>
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<td>Reciprocating saw (bone saw)</td>
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<td>Syringe – 30cc, box</td>
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<tr>
<td>Basins – large</td>
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<td>Staple – skin</td>
<td>10</td>
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<tr>
<td>Basins – small</td>
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<td>Stockinette – intermediate</td>
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<td>Sheet – thoracic</td>
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<td>Gown bundle (3/pk)</td>
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<tr>
<td>Sheet – utility</td>
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<td>Tubing – smoke evacuator with adaptor (standard)</td>
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<tr>
<td>Drape – overhead table cover</td>
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<td>IV tubing – sterile</td>
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<tr>
<td>Drape – ¾ sheet</td>
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<td>Flannel bandage – 4</td>
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<tr>
<td>Split sheet – large</td>
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<td>Gigli saw blade 20</td>
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<tr>
<td>Cover – table</td>
<td>4</td>
<td>Gigli saw handle</td>
<td>1</td>
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<tr>
<td>Towel – green (6/pk)</td>
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<td>Osteotomes – donor</td>
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<td>#22 blades</td>
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<td>Light handles</td>
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<tr>
<td>Opsite – 45cm x 55cm</td>
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<td></td>
</tr>
<tr>
<td>Sponge – 12 ply, 4x8</td>
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</table>
Step 8

Case Closure and Follow-up
The recovery process marks the closure of the main clinical aspect of a donation case. However, support for donor families continues and is carried out by both TGLN personnel and the hospital team. In addition, outstanding results of tests or observations during the recovery surgery must be communicated to the transplant teams to ensure the health of the recipient and to meet Health Canada Standards.

**What information does TGLN provide to families following donation?**

A sympathy card is sent to the family within 48 hours of their child’s death on behalf of TGLN. TGLN coordinators also send donor families a letter within one to two weeks indicating the outcome and offering a brief description of who was helped through the gift of donation.

After the initial correspondence, the TGLN donor family aftercare program (a 12-month program) provides support and resources to donor families. The program also provides the opportunity for donor families to participate in TGLN initiatives that honour organ and tissue donors. The information is tailored for each family and may include:

- Grief library resources (pamphlet and website link).
- *Writing to Transplant Recipients* information pamphlet.
- One-year anniversary card to commemorate the death of their child.
- Donor family survey (to help improve the donation process and support received).
- Information on the ‘Celebration of Life’ event – a memorial tribute and medal presentation honouring donors and their families.

The hospital may also provide support pamphlets for family members and siblings (available for a variety of age groups). Some hospitals may also offer commemorative ceremonies for children who have died within their facility. Preliminary literature suggests that family members appreciate both the service as well as re-connecting with hospital staff at this time. Families are also grateful for any cards received from staff who cared for their child. Other site-specific bereavement services may include:

- Taking photos of their child. The family may wish to have photos of their child being held.
- Clipping a lock of hair for a family keepsake.
- A blanket and/or gown (children and infants).
- Foot and hand moulding (children and parents of young children).

Receiving such mementos may be of help in the family’s grieving process.
Will donor family and recipient contact be possible?

- All donor and recipient information is confidential as per the *Trillium Gift of Life Network Act*.
- An anonymous exchange of letters between recipients and donor families may be facilitated through TGLN donor family services in conjunction with the transplant programs. Donor families may also request an update on recipient status by making a wellbeing request to TGLN in the future.

What follow-up of test results is needed after donation?

TGLN coordinators will call the ICU or hospital lab to follow up on preliminary and final urine, sputum, and blood culture results. Any positive serology reports of reportable diseases are communicated to the department of Public Health who in turn contacts the family physician with the results. In addition, the transplant teams are advised of any test results that may directly impact recipients so that steps can be taken towards any necessary treatment (e.g. use of antibiotics if donor cultures are positive).
Appendix
Appendix 1:
Registering Consent to Become an Organ and Tissue Donor in Ontario

How is consent to become an organ and tissue donor registered in Ontario?
Anyone 16 years or older, with a photo ID health card or red and white health card, can register consent online at beadonor.ca, or by visiting a ServiceOntario centre. If you have previously registered a decision of “Yes” to donate organs and tissue with Ontario Health Insurance Plan (OHIP), you do not need to re-register.

At or near death, how is the registered consent decision communicated to the healthcare team members?
If this information is readily available during your conversation with the TGLN coordinator, you will be made aware of a registered consent decision.

What if a person wants to be a donor but has not yet registered consent with the ServiceOntario office or has not yet made a decision?
The choice to donate can also be communicated by healthcare directives or by family members. When a person’s donation decision is not known, specially trained TGLN coordinators work with families and the healthcare team to learn what the person would have wanted if they were able to make the decision.

Why is registering consent through beadonor.ca or a ServiceOntario office the best way to communicate the choice to donate?
Access to registered donation consent decisions in the OHIP health card database is available at any time, day or night. In this way, a person’s consent to donate can be determined whenever it is needed.
Appendix 2: Organs and Tissues that may be Donated for Transplantation

Diagram 5

ORGAN AND TISSUE DONATION GUIDE

<table>
<thead>
<tr>
<th>Organs</th>
<th>Tissues</th>
</tr>
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<tbody>
<tr>
<td>Lungs</td>
<td>Eye Tissue</td>
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<tr>
<td>Heart</td>
<td>Skin</td>
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<tr>
<td>Liver</td>
<td>Heart Valves</td>
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<tr>
<td>Pancreas</td>
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</tr>
<tr>
<td>Kidneys</td>
<td>Bone</td>
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<tr>
<td>Small bowel</td>
<td>Tendons</td>
</tr>
<tr>
<td>Bone</td>
<td>Ligaments</td>
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<tr>
<td>Ligaments</td>
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</table>

Organ Donation

Neurologically Determined Death (NDD)
- Heart
- Lungs
- Liver
- Pancreas/Islets
- Kidneys
- Small bowel

Organ Donation

Death by Circulatory Determination (DCD)
- Kidneys
- Lungs
- Liver
- Pancreas

Tissue Donation

In situations of organ donation with NDD, DCD, as well as most deaths
- Bone and tendons
- Eyes and Corneas
- Heart for valve recovery
- Skin