Donation after Neurological Death – NDD
General Information

Prior to recovering organs, BC Transplant will have confirmed the following:

- suitability of the potential organ donor
- consent for donation
- two Brain Death Declarations signed by two different board certified physicians

Multi-organ recovery surgery will take approximately 2-4 hours to complete, depending on which, and how many organs are being recovered.

Operating Room Checklist - NDD

The Operating Room staff will be informed of the organs intended to be recovered. Please add the following additional items to your basic laparotomy set-up.

A. *Back tables* (total of 2-3)	1 for your hospital scrub nurse 1 for the BCT instruments and perfusion lines 1 on standby in case lungs are recovered
B. *Single Basins* (total of 5)	2 in ring stands *(one for slush, one for sternal saw)* 2 on the BCT back table *(one for slush, one for liver)* 1 extra basin if lungs are recovered (on the lung back table)
C. *Mayo Stands*	1 for your hospital scrub nurse 1 for Cardiothoracic Surgeons (if lungs are recovered) *Undraped mayo stand goes over donor's head prior to draping. Drapes go over top of mayo stand.*
D. Cautery Machines	2 Cautery Machines set at coag: 100, cut: 0
E. Suctions	3 suction units
F. IV Poles (total of 1-3)	1 for Below diaphragm *(liver, kidneys, pancreas)* 2 for Above diaphragm *(1 for lungs,1 for heart)*
G. Extras	Medium Clip Appliers and Bars Lap Sponges Large Orthopedic Mallet Sterile Gowns for up to 6 personnel Bone Wax Silk Ties: number 2 or 4, and 2-0, 3-0, and 4-0 Umbilical ties 3 x 1000cc bags of NS
H. Defibrillator	Available in or near retrieval OR (internal & external paddles)

I. ***Bronchoscope*** <u>If lungs are being recovered:</u> Flexible Bronchoscope with sputum trap & suction needs to be available at start of case

J. Buckets of Ice Non-sterile ice for the end of the case (2-3 buckets)

K. Metal Bucket For the bleed-out line

L. Slush Machine <u>If a slush machine is available,</u> please make 4-6L of sterile slush

<u>Note:</u> Donor will be transferred from ICU bed to OR table. Please have a bed warmer or a lower body Bair Hugger ready to place on the donor to keep him/her warm.

Equipment Supplied by BCT

- Preservation solutions and perfusion equipment
- Vascular and cardiothoracic instruments
- Stryker sternal saw & blade (may use hospital's if available)
- Chest and abdominal retractors
- Sutures
- Sterile slush for intra-abdominal cooling
- Storage containers and packing for recovered organs

Donor Hospital Personnel Required

- Scrub nurse
- Circulating nurse
- Anesthesiologist

Personnel Supplied by BCT

Below Diaphragm Recovery

- Two renal/hepatic surgeons
- One Surgical Recovery Specialist (SRS)
- One Organ Recovery Assistant (ORA)

Multi-Organ Recovery

- Same as above, plus an additional two cardiothoracic surgeons

The names of all visiting personnel will be given to the operating room. Occasionally, an out-of-province recovery team will accompany the BCT organ recovery team.

Liver/Kidney Biopsy

On occasion, when the liver or kidneys are being retrieved for transplant, a biopsy of one or both of these organs will be obtained by the recovery surgeon at the beginning of the organ recovery procedure. The Organ Recovery Team (BCT) may request that a local pathologist examine the frozen section biopsy for histological interpretation.

Please provide copies of any biopsy reports (frozen and permanent sections) to the recovery team, so that findings can be correlated with the recipient's immediate post-transplant clinical treatment.

Operative Report

A BCT *Record of Organ Procurement* form will be filled out by the BCT Surgeon in Charge at the time of the recovery. This form lists the personnel in attendance, the organs recovered and any noted abnormalities. The original of this BCT form will be left on the patient's hospital chart and copies will be retained by the recovery team.

Coroner's Cases

Two declarations of death have been completed prior to the patient's surgery; therefore an **organ recovery does not constitute an operating room death and does not automatically become a Coroner's case**. BCT does not require a BC Vital Statistics Certificate of Death. In Coroner's cases, permission from the coroner is obtained prior to the organ recovery surgery. Occasionally, the coroner will request, and subsequently make arrangements for a pathologist to witness the surgery.

Care of Body Following Surgery

The BCT recovery surgeons will restore the external appearance of the body at the end of the procedure. Care of the body following the recovery surgery is according to your hospital's policy and procedure.

Sequence of Events

It is not BC Transplant's intent to disrupt your operating room schedule. BCT's Coordinators want to work with you and your OR's schedule to try to find the time that will work best. However, please know that we are also trying to balance the OR's schedule with the stability of the donor, the timing for the recipient's surgeries, consideration for the donor's family's needs, and the logistics of travel for our surgical team, as well as any other out of province surgical teams that may be coming.

For a donor who is hemodynamically unstable, or in multi-organ failure, the timing of the surgery is very important. Once an organ donor is confirmed, recipients awaiting a life-saving transplant are admitted to hospital for their transplant. In addition, once removed from the donor, a heart and lungs can only be stored on ice for 4-6 hours. This limited

viability time means donor surgery must be done while the potential recipients are being prepared in the operating room at the transplant hospital.

Pre-operative Phase

Once the OR time is set, the BCT Coordinator will contact the OR to discuss the arrival time of him/herself and the ORA, usually about forty-five minutes to one hour prior to the surgery.

Upon arrival in the OR, the BCT Coordinator will introduce our team. The BCT Coordinator and ORA are there to help answer questions, assist with final room set-up, and provide all the specialized organ recovery equipment that BCT brings.

The BCT Coordinator will review with the OR staff the following:

- Donor Consent
- Brain Death Declaration x 2
- Planned organs to be recovered

The BCT Coordinator will have to go to the ICU to check on the family, verify the ID of the donor, collect last minute labs and donor information, check with the ICU and family that they are ready to transfer to the OR. During this time, the ORA will remain in the OR to assist the staff with the final OR set-up.

When the Family, OR, and ICU are all ready, the donor will be transferred to the OR according to your hospital's transfer policy.

Instrument Set-up

- **Green** handled instruments are for below diaphragm and **Blue** handle instruments are for above diaphragm

The scrub nurse will work mostly with the below diaphragm surgeons, using the **green** instruments.

Blue instruments will be placed on a mayo tray. A mayo stand will be placed over the donor's face, prior to draping. Once the drapes have gone on over the mayo stand, the tray with the **Blue** instruments will be placed on the stand for the cardiothoracic surgeons to work from.

There is often not enough room at the head of the sterile field for a scrub nurse to directly assist the cardiothoracic surgeons. For this reason the surgeons help themselves from the mayo tray. However, if additional instruments are required, the scrub nurse will need to pass them up from his/her back table.

- BCT instrument pans are counted separately from hospital instruments.. They are counted by the instrument prior to the recovery and then as a total set after (a total

number of instruments for the **green** pan, and a total number of instruments for the **blue** pan) to ensure that we have all of our instruments

Bronchoscopy

- If the lungs are being recovered, a bronchoscopy will be done in the OR prior to incision, usually by the cardiothoracic surgeon. Sputum trap and suction will also be required to collect sputum samples. These samples will be sent to your hospital's lab for C&S. Please have the necessary supplies in the OR.

Positioning & Draping

- Arms must be securely tucked at the donor's sides
- Lower body Bair Hugger covers legs, or a bed warmer under donor
- Skin is prepped from chin to mid thigh, bed line to bed line
- Two cautery pads are placed on the donor
- Once the cardiothoracic surgeon has completed the bronchoscopy (if recovering lungs), the mayo stand is placed over the donors face, under the drapes

Draping needs to expose the donor's entire chest and abdomen. It will consist of:

- 6-8 square drapes

AND

- 1 large abdominal drape with an extra full sheet and drape tape for the head of the bed, over the mayo tray

OR

- 4 free drapes

OR

- 2 Large split drapes

Intra-operative:

- Prior to skin incision, a timeout will be completed, and a "moment of silence" will be observed in the OR
- Skin incision is made using a cautery from sternal notch to pubic symphysis
- Balfour retractor is used for abdominal retraction
- Chest is opened using the Stryker saw with blade facing up
- A Cooley or O'Connor retractor will be used for thoracic retraction (based on surgeon preference)
- Tissues around the organs are then dissected using metz, debakeys, and westphals; for NDD, this dissection is done while the organs are still being perfused by the donors blood flow.
- Once the organs are freed up as much as possible, a perfusion cannula is secured into the aorta using #4 Silk ties (60" cut in half). Have some loaded on westphals, and some free
- A bleed-out cannula may be placed, depending on surgeon preference, in the Vena Cava and also secured using #4 Silk ties

- If retrieving lungs, an aortic root cannula will be placed in the pulmonary artery and secured with 4-0 Prolene suture, for perfusion of the lungs
- If retrieving the heart, an aortic root cannula will be placed in the aortic root and secured with 4-0 Prolene suture, for perfusion of the heart
- Once the cannula(s) have been secured, and everyone is ready, the aorta will be x-clamped and perfusion will be started using cold solutions supplied and monitored by the BCT coordinator. **At the same time, the Bare Hugger needs to be turned off,** and the abdominal and thoracic cavities will be quickly packed with sterile slush.
- When all the organs have been flushed with preservation solution, and are fully cooled, the organ dissection will be completed, and the organs will be recovered.

***Important note if retrieving lungs:** Anesthesia will be asked to inflate the lungs just prior to trachea being stapled. Once the inflated lungs are removed from the chest by the cardiothoracic surgeon, they, and all the instruments up on the top mayo stand, are to be considered contaminated because they have come in contact with the trachea which was open to the oral cavity.
For this reason, the surgeon, who is now also considered contaminated, will take the lungs to the separate lung back table. He may do a retrograde flush of the lungs, and then he will package them and pass them off to the BCT Coordinator.

- Once the packaged lungs have been passed off, and the cardiothoracic surgeon has unscrubbed, the circulating nurse may disassemble the contaminated lung back table

The organs are usually recovered in the following order:

- Heart *(If recovering lungs, but not heart, the heart will need to be removed to gain access to the lungs. The heart then needs to be replaced in the chest cavity, prior to closure)*
- Lungs
- Pancreas (whole or Islets)
- Liver
- Kidneys
- Adjunct Vessels
- Portion(s) of the spleen will be taken for tissue typing

The organs, with the exception of the lungs, will be packaged by the ORA and then passed off to the BCT coordinator

Postoperative

- At Lower Mainland hospitals, heart and Lungs will be sent by ambulance to the transplant hospital as soon as they have been recovered
- If organs must be sent to other programs (i.e. outside of BC), they may be sent ahead of the team via ambulance to an awaiting jet at the airport

- The BCT Coordinator will take all other organs at the end of the case and deliver them to their respective transplant hospitals. It is for this reason that the BCT team will depart very quickly following the end of the surgery.
- The recovery Surgeon in Charge will sign the Record of Organ Procurement and a copy will be left on the donor's hospital chart
- Postoperative care of the donor should be done according to your hospital policy
- BC Transplant is available for post-op debriefing, in-services and ongoing educational needs. Please contact us anytime at 604-877-2240.