

# RETRIEVAL OF HEARTS FOR RESEARCH FROM DBD DONORS BY ABDOMINAL NORS TEAM

## Objective

This SOP is to support abdominal NORS teams to retrieve Hearts for research in DBDs donors when a heart has been accepted for research, following families consent to INOAR. The SOP outlines the process that looks to reduce CIT and increase the number of hearts accepted for research.

## Changes in this version New

### Roles

- Abdominal NORS team: Performs DBD organ retrieval.
- Limited to Cambridge and Edinburgh NORS teams presently.

### Restrictions

- This protocol is only to be trained to competent NORS abdominal surgeons who are also competent in use of the DLP cannula (i.e. NRP competent)
- DBD only

### Items Required

- DLP cannula.
- 1 -2 litre of HTK perfusion fluid
- Abdo retrieval pack
- Perfusion giving set
- 1 litre Frozen Normal Saline
- 2 litres of ice cold Normal Saline for iv use (for bagging organ)
- Small organ transport box ('kidney box')
- Non sterile melting ICE for packing
- **FRM 6297** – Cardiothoracic Human Tissue Authority Research A Form.
- Organ transport bags x 3

## Instructions

### 1. Background

Supporting transplant research and innovation is a cornerstone of the 10 year vision for organ donation and transplantation (<https://nhsbt.dbe.blob.core.windows.net/umbraco-assets-corp/23463/meeting-the-need-2030.pdf>), with one of the key goals to increase number of organs available for research through INOAR (Increasing the Number of Organs Available for Research). Although the introduction of INOAR has led to increases in the number of lungs and diabetic pancreas removed for research purposes, there has not been the anticipated

increase in the numbers of hearts for research, (data from Jan 2021- Aug 2022: 219 Hearts offered for research, 41 accepted, 19% acceptance rate).

Discussion with the UK cardiac research groups suggests that one of the main barriers to accepting hearts for research is the requirement for the heart to be retrieved using the same protocols as if it were going to be used for transplantation. At the moment, this generally limits acceptance of hearts for research to those occasions when a cardiothoracic NORS team will be in attendance, and this occurs relatively infrequently (in <10% of occasions when the lungs are still being retrieved?).

One possible solution is that hearts for research from DBD donors that are being attended by either the Cambridge or Edinburgh NORS teams would be retrieved by that team using the protocol below. This mirrors the approach adopted by cardiothoracic NORS teams when retrieving the heart for implantation purposes, and critically, retrograde perfusion with **Histidine Trypophan Ketogultarate (HTK)** will act as a cardioplegic agent and ensure rapid cardiac stasis.

Discussions with cardiac researchers with active RINTAG projects have confirmed that this would allow them to accept these hearts for research. We propose that at offering of the heart for research, the researchers are notified that the hearts will be retrieved using **HTK** solution as for implantation purposes:

## **2. Process**

Organs will be offered as per SOP4442 there will be no changes to how INOAR hearts are offered for research if a family has given consent/authorisation to INOAR.

If the heart is accepted for researchers Hub op will notify the NORS team when mobilising as per SOP4442 so they know to bring the correct equipment.

Researchers, if interested in the heart for research offer, will have to call hub ops to identify which abdo team is attending.

The abdominal team will then follow the process below.

### **Surgical Procedure**

Once abdominal dissection is complete, and just prior to commencing abdominal perfusion:

- Heparinise the donor in the conventional fashion
- Cannulate the abdominal aorta and secure as usual
- Apply cross clamp to aorta as for standard abdominal retrieval.

For heart retrieval (for research), it is required to vent IVC in pericardium to empty the heart.

- Cut inferior vena cava in pericardium as soon as possible after the aortic cross clamp

- Start abdominal cold perfusion as usual (Assistant to pour ice slush in abdomen as usual)
- Place the DLP cannula in the aortic arch attached to a 1-2 litre of HTK
- **Occlude Aortic arch distal to DLP cannula with clamp.**
- Commence aortic DLP perfusion with HTK
- Cut open left atrial appendage or pulmonary vein.
- Pour ice slush around heart in the pericardial sac
- Retrieve abdominal organs. (At an opportune time, the heart can be removed to the back table)
- Remove heart to bag of ice cold saline on back table.
- Heart should be prepared for cold static storage;
  - ensure heart is submerged in ice cold saline (approx. 2 litres) in the first bag, de-air and tie as usual.
  - place in a second bag with a small amount of ice cold saline, then de-air and tie as usual.
  - place in 3<sup>rd</sup> bag, de-airing and tying as usual.

The bagged heart should then be placed in the transport box and covered with non-sterile melting ice.

- Complete Cardiothoracic Human Tissue Authority Research A Form (**FRM 6297**)

Author: Mr Ian Currie  
Associate Medical Director Organ Retrieval.

## **End of Procedure**

### **Definitions**

- **DLP Cannula** - retrograde cannula used to flush perfusion fluid into the coronary artery .

### **Related Documents / References**

- **FRM 6297** – Cardiothoracic Human Tissue Authority Research A Form.
- **SOP4442** – Allocation of Organs and Tissues for Research and Novel Technologies – Hub operations.
- **MPD 1043** – National Standards for Organ Retrieval Deceased Organ Donor
- **SOP 5499**- Theatre Manual for Deceased Organ Donors
- **INF 1512** – Instructions for use Organ Boxes

