

OCS Training Manual DCD Hearts



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DCD HEART RETRIEVAL

1. PREPARATION AND EQUIPMENT

Equipment Location and Daily Checks

The OCS machine and all equipment required for DCD heart retrieval are stored in the Retrieval Basement Room at Royal Papworth.

- A daily Basement Equipment Checklist must be completed by a member of the Retrieval Team.
- This ensures:
 - Equipment integrity
 - The OCS Run Bag is fully stocked
 - The bag is locked and ready for immediate use
- Before leaving Royal Papworth:

Check battery levels



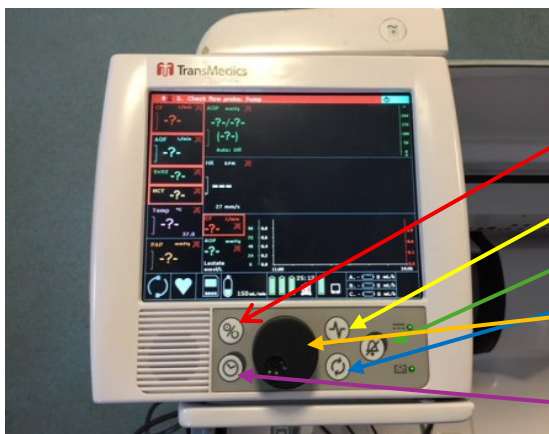
Batteries

Check gas cylinder (change if less than 12 hours remaining)



Gas cylinder- to open the gas left, to switch it off turn right (Remember “Righty tightly, lefty looseie “

Turn on the wireless monitor



On and off

Sync mode

Mute the alarms

Adjust the Flow

Control knob

Timmer -Press when heart mounted on the machine

Two team vehicles will travel for DCD heart retrieval to allow transport of all required equipment.

An OCS Run Equipment Checklist (Appendix 2), kept in the Basement Office, must be used to tick off items as they are packed.

Equipment Required for DCD Heart Retrieval



- OCS Rig
- Heart Perfusion Set (OCS Module)
- Run Bag
- Cell Saver
- OCS Zoll Defibrillator
- Mindray Defibrillator
- TP Black Box (see Perfusion Manual)
- Roadside Bag
- EPOC x2 plus cartridges
- OCS Drug Box x2
- Ringers Solution (500 ml x3)
- Cardioplegia
- Ice Boxes (1–2 depending on lung retrieval)
- Pneumoplegia if lungs accepted (see Lung Protocol)

Once equipment is checked, packed, and all staff are present, the team is ready to leave.

Confirm who is responsible for communicating with the SNOD regarding departure, delays, or issues.

2. ARRIVAL AT DONOR HOSPITAL

Transfer all equipment to theatre except the Roadside Bag, which remains in the vehicle.

3. THEATRE SET-UP

OCS Positioning



- Position OCS near a plug socket (must remain plugged in while in theatre)
- Apply brakes
- Remove lid
- Position OCS defibrillator next to machine
- Lubricate pump flow connector and AOF connector
- Turn gas on

Clear communication within the team, especially with the SNOD is essential. All drugs, equipment, and paperwork must be prepared before the donor arrives in the anaesthetic room.

Discuss delegation of roles at this stage.

Prepare:

- Blood samples
- NHSBT retrieval paperwork
- DCD Heart Passport

4. DRUG PREPARATION

The OCP is responsible for preparing all medications according to the DCD Heart Protocol (located in the TP Black Box).

Prepare:

- Vancomycin 1 g
- Meropenem 1 g
- Heparin 25,000 IU (for RA – give to scrub nurse)
- Heparin 25,000 IU (for PA – give to scrub nurse)

Cardioplegia (Donor Hospital TP will prepare the cardioplegia)

Add to 500 ml Ringers:

- 2,500 IU Epoetin Alfa
- 50 mg GTN
- 3 ml Sodium Bicarbonate 8.4%
- 10 ml cardioplegia concentrate

Store in ice box but keep accessible.

Cardioplegia (Recipient Centre)

Prepare two 500 ml Ringers bags (total 1 L), each containing:

- 2,500 IU Epoetin Alfa
- 50 mg GTN
- 3 ml Sodium Bicarbonate 8.4%
- 10 ml cardioplegia concentrate

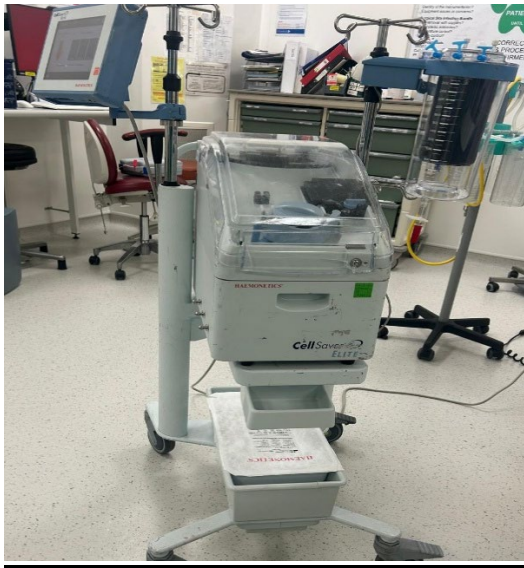
OCS Heart Solution Set Additives

Solutions for OCS (Heart Solution Set)	Additive
Transmedics Priming solution	20mls Sodium Bicarbonate 250mg Methylprednisolone
Transmedics Maintenance solution	50 Units Actrapid
Adrenaline infusion (5% Glucose 500ml)	0.25mg Adrenaline 30 Units Actrapid

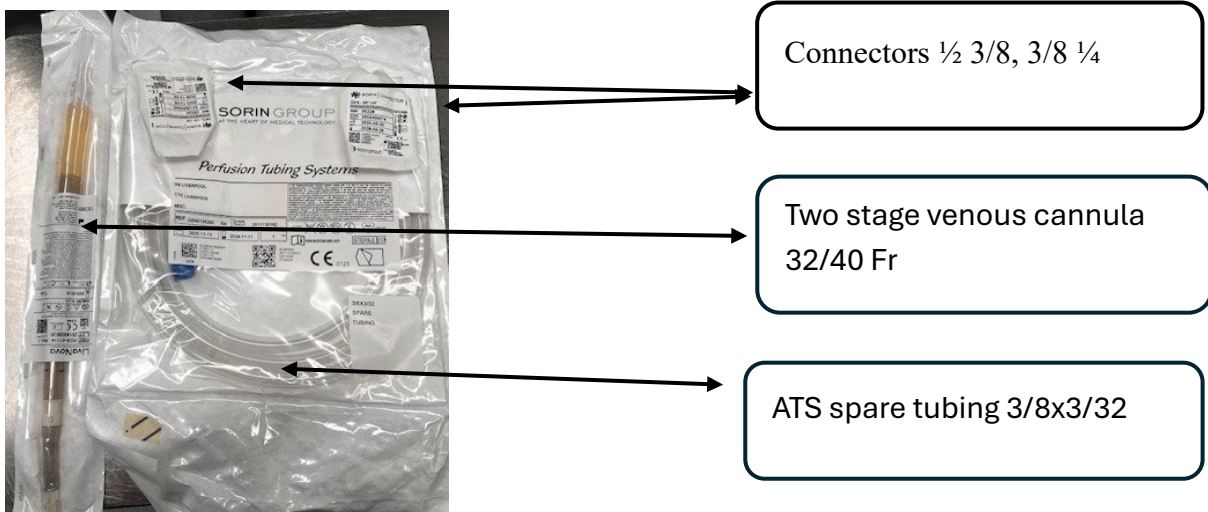
Ensure maintenance bag chambers are mixed by breaching peelable seal



5. SUCTION SET-UP



- Position reservoir at head end near functioning suction carousel (or cell saver if brought on retrieval)
- Prepare 500mL saline with 25,000 IU Heparin
- Attach (via gravity) giving set and run through suction pot
- Leave 100 ml in bottom and clamp
- Add another 20.00 IU Heparin directly into the reservoir
- Additional blood collection items for scrub nurse (can be given before withdrawal)
 - ATS spare tubing 3/8x3/32
 - Connectors ½ 3/8, 3/8-1/4
 - Two stage venous cannula 32/40 Fr



6. WITHDRAWAL OF TREATMENT

When all teams are ready, the SNOD will transfer donor to anaesthetic room.

If lungs are being retrieved:

- Follow DCD Lung Protocol
- Do NOT give scrub nurse Flolan
- Add 2x50 mg Flolan to 1 L Perfadex

7. BLOOD COLLECTION

- A Transplant Practitioner will assist with blood collection.
- The surgeon will hand over the standard suction tubing and the ATS spare tubing to be connected to the reservoir, which is already attached to suction/Cell Saver.
- Ensure the ATS spare tubing (the wider tubing) is clamped until you are ready to begin blood collection. Unclamp when ready to collect.
- Aim to collect **1.2–1.5 litres** of blood.
- Once the required volume has been collected, disconnect all attachments from the reservoir to prevent accidental suction of cardioplegia.
- After the OCS module has been installed, transfer the collected blood into the OCS heart chamber

The OCS module and instrumentation set must not be opened until the surgeon confirms the heart is suitable (after coronary assessment).

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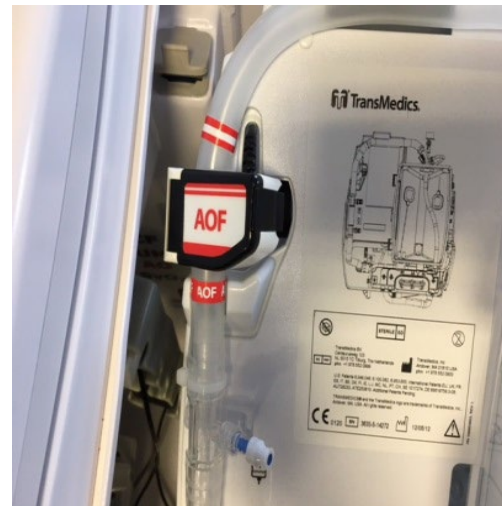
Only once suitability is confirmed should the OCS operator open and set up the module

8. INSTALLATION OF OCS MODULE

- Open packaging along perforation
- Remove pink foam from base
- Insert module at 30° angle until it clicks
- Connect AOF probe, pump probe, gas (85% O₂, 1% CO₂)



Single used module
installed on the OCS



Aortic flow probe



Pump probe



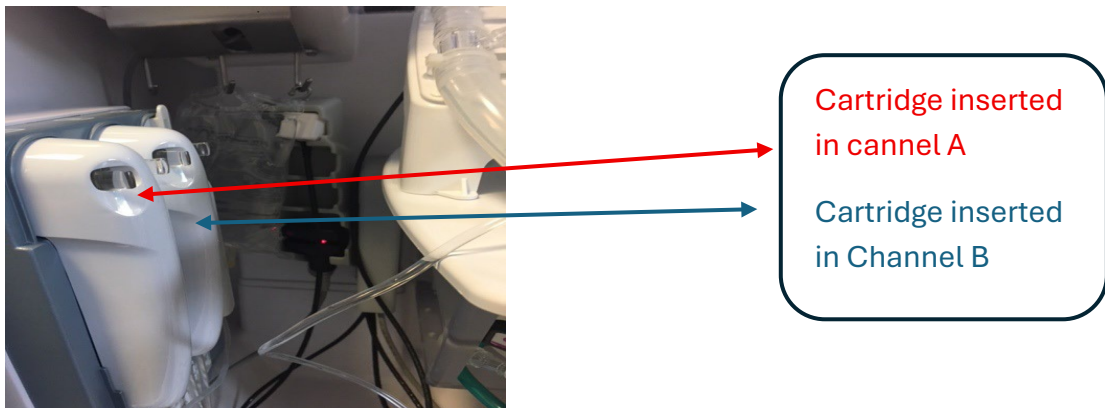
Gas connected to the OCS

Turn the monitor on and silence alarms. Alarms silenced by pressing and holding the alarm button until it beeps

- Start pump at 0.8- 1 L
- Hang maintenance and adrenaline bags
- Prime circuit using priming solution
- Connect yellow-to-yellow prime line and run through priming solution

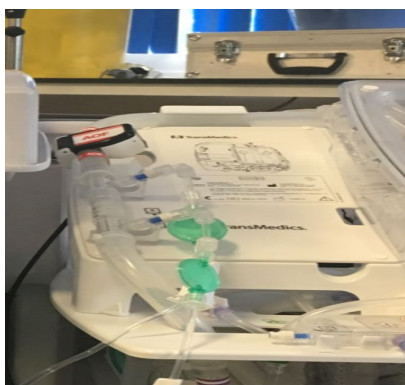
9. SDS CARTRIDGES

1. Remove guards, caps, and body clip (retain white channel covers)
2. Insert SDS cartridge (foot first, then clip into brass head)



3. Spike bag (line clamped)
4. Prime the infusion lines fully before connecting them to the OCS module.

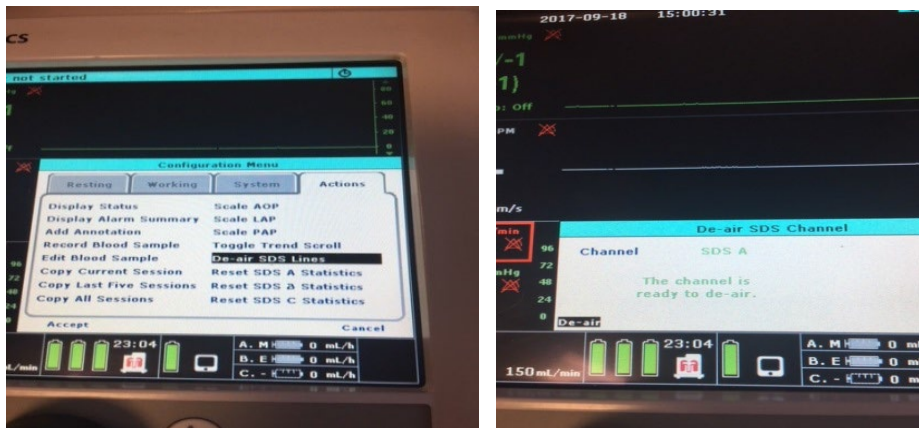
Once priming is complete and all air has been removed, connect:



- Channel A → Maintenance → Port 1
- Channel B → Adrenaline → Port 4

Do not connect the lines to Ports 1 and 4 before priming, as this may cause backflow

5. De-air both channels using wireless monitor



10 SET UP THE MONITOR :

- Maintenance: 30 ml/hr
- Adrenaline: 10 ml/hr
- Temperature: 34°C



Press accepts twice to start pump

11. DRAPE WORK AREA

- Remove wireless monitor
- Open drapes (tabs 1–4)



- Establish sterile field
- Wear sterile gloves to open heart chamber
- Remove Y connector



Y connector

Injecting port
used to
administer
medication

ABG sampling
port

12. ASSISTING SCRUB NURSE

Establish prior withdrawal with a member from local team to open the sterile items from the single use OCS module (only when confirmed retrieval is going ahead)

- Left heart vent catheter
- Aortic connectors x4 (from the OCS kit)
- Y connector ($\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$) if lungs retrieved
- Foley catheter x2 (if lungs)
- Cable ties and tool (from the OCS kit)
- PA cannula (from the OCS kit)



Maintain sterility at all times.

13. INSTRUMENTATION ONTO OCS

Surgeons instrument the heart onto OCS.

- Reduce pump flow during instrumentation
- Start clock once heart is on OCS
- Maintain:
 - AOP 60–70 mmHg
 - Pump flow 1 L (titrate to AOP and communicate with the retrieval surgeon)

14. PACING (If Required)

- Set pacing box to 80 bpm
- Connect pacing leads and pins (Red OCS Bag)
- Attach to HPM defib connection

15. DEFIBRILLATION (If Required)

- Attach defib to HPM connector
- Set to Defib mode
- Start at 10 J
- Charge
- Confirm all clear
- Deliver shock
- Increase if required (max 50 J)

16. BLOOD GAS MONITORING



- Arterial and venous gases required (please ensure you use one gas machine for both gases)
- Document in DCD Heart Passport
- Every 15 minutes for first 90 minutes
- Every 30 minutes thereafter
- OCP to interpret and act after discussing with the lead surgeon
- Document all medications administered

17. PREPARING TO LEAVE DONOR HOSPITAL

- OCS must not be left unattended
- Monitor pressures continuously
- Pack all equipment

The following must travel with the heart:

- Ice box with the 2 bags of cardioplegia
- 2 giving sets
- 1 three way tap
- 2 pressure bags 1l
- Roadside bag
- OCS Run Bag
- 1 Drug Box
- 2 x EPOC machines and cartridges

Blood gases continue during transport.

Ensure ongoing communication with the recipient centre

18. ARRIVAL AT IMPLANTING CENTRE

- Transfer OCS and equipment to theatre
- OCP and surgeon remain with OCS until implantation
- Continue blood gas monitoring (EPOC or bench analyser)

When ready for explant:

1. Attach 3-way tap to de-air port
2. De-air plegia port using 10 ml syringe
3. Trickle cardioplegia to prime
4. Attach giving set (clamped)
5. On surgeon instruction, run cardioplegia
6. Turn down pump flow
7. Document timings

Once heart removed:

- Dismantle contaminated module
- Clean OCS with Actichlor
- Prepare to leave theatre
- Restock all equipment at Royal Papworth before going home
- Ensure OCP have a copy of the DCD Passport
- Ensure DCD Passport is emailed to DCP/TP email
- Ensure OCS Module Used Spreadsheet is completed

OCS RUN EQUIPMENT CHECK LIST

OCS Console	
OCS Module	
OCS Run Bag	
Cell Saver (if plane involved no need to take the Cell Saver	
Zoll Defibrillator	
EPOC Machine x 2	
EPOC Cartidges (Check expiry dates)	
Heart Perfusion Fluid	
Cable Tie Tool, Small Diameter	
TP Black Box	
Drug Boxes	
Emergency Roadside Bag	
Ringers and Cardioplegia (1L bag and 500ml bag)	
Perfadex (If lungs accepted)	
Ice Boxes	