**Summary of Key Learning Identified from NRP Debriefs**

With an increasing interest from abdominal NORS teams to start/restart NRP programmes it was proposed to hold a monthly meeting to debrief recent DCD cases when NRP was used, to provide an opportunity to share practice across the UK. The first NRP debrief was held on the 11th of January 2022, all abdominal NORS teams were invited.

Each month cases are selected based on the benefit of sharing learning with the wider community, some have been from experienced NRP centres, some from those starting up their programmes, depending on the lead surgeon's availability. All summary notes from the meetings to capture the interesting questions and discussion points have been shared with all abdominal NORS teams in addition to the key learning identified now being shared here.

Our thanks to those who have joined the meetings and taken the time to present cases.

**Planning, communication, and logistics**

- Important to be informed of potential for ANRP at the earliest opportunity. If the Hub are informed about the intention to use NRP, they will pass this on to other teams, SNOD etc. (Jan 22, Nov 22)
- If a blended team (NORS team plus supporting NRP surgeon/perfusion practitioner from a different team), important to ensure that all relevant NRP equipment is brought to donor hospital. (Jan 22)
- Always take a liver box when using NRP as it may be accepted later (Apr 22)
- Be aware of pts who normally take anti-coagulation and consider what impact there may be if reversal agent patients have been given. (May 22)
- Communication is key (Jul 22)
- Make sure you have all information pre surgery you can – look at scans for any vascular abnormalities (Jul 22)
- If a prior CT is available, it is important to identify calcified vessels ahead of time and plan where to access an artery to cannulate. Could consider going for femoral cannulation if the aorto iliac arteries were known to be blocked. Difficult to do this in retrospect unless the groins were prepared and draped, and appropriate cannula sizes were available. (Jul 22)
- Encourage discussing cases with NRP colleagues across centres for advice in complex cases. (Jul 22)
- Ability to consider older donors – this donor was 74yrs (Aug 22)
- Not to be frightened by previous thoracic surgery (Aug 22)
- Important for NRP team to have clear roles and responsibilities for inventory (Nov 22)
- Essential to have a clear plan between SNOD/NORS team if the family are present, to consider place of WLST and any bespoke family requests carefully to ensure whole team are comfortable (Dec 22)
- Essential to have clear planning, communication and role assigning when joining another team to provide NRP (Sept 23)
- Consider involving cardiothoracic colleagues to assist with retrograde cannulation through the right atrium (Dec 23)

**Onsite preparation and set-up**

- Liaise with local labs regarding blood storage – Cambridge reported using cold boxes to allow blood to be in theatre without risking wasting any blood. Explain to haematologist/labs. (Apr 22)
- WLST on PICU whilst not ideal if DCD heart in involved is a very reasonable compromise. (Jun 22)
- Priming the circuit – substitute blood for Hartmann's as per protocol. With patients who have a small circulating volume key to include blood in the prime to reduce the dilution. Do not replace whole prime with blood after it has been made up as it will remove all heparin. (Jun 22)
- Maastricht 4 controlled DCD Donors – differences to note
    - The donor can be heparinised before ventilation is discontinued
    - The National Organ Donation Committee have agreed that a no touch period of 5 minutes following circulatory arrest be respected before the donor is transferred to the operating room and surgery commenced.
    - An aortic vent should always be placed in a category 4 donor
    - Since the next of kin have concerns about the beating heart, the donor team should consider infusing UW solution (or cardioplegia) into the aortic root via the vent cannula, with a temporary clamp distal to this, if the heart restarts to cause a cardioplegic arrest and suppress fibrillation if this occurs.
- Important to set up the NRP machine in the same formation as the mentoring centre (Feb 23)
- If felt necessary to mark the femoral artery prior to WLST, liaise with the SNOD to arrange with the ICU team. Important to maintain distance between surgeons and donor prior to WLST in all cases (Feb 24)

**From withdrawal to stable NRP**

- There is time to sort problems when getting on the circuit. (Feb 22)
- Uncertainty in the first 10mins on NRP is concerning as a new team – the mentorship is so beneficial. (Mar 22)
- Aortic cannulation is preferable in paediatrics due to the smaller vessels. (Jun 22)
- Ability to cannulate in the abdomen to vent the thoracic aorta by putting DLP into the supra coeliac above the clamp (Aug 22)
- Take your time to insert the Seldinger when cannulating the vein (Oct 22)
- Important for newer centres to start cannulating in the abdomen, groin cannulation can be tricky (Oct 22)
- Reduce/stopping pump flow during bleeding (Feb 23, Jan 24)
- Consider longitudinal incision for larger donors, and if so, ensure the SNOD is aware of difference in placement of incision (Apr 23)

**Monitoring, bloods, and course corrections**

- Importance of all members of the team in recognising and managing unexpected complications, benefitting from regular simulations including practicing response to pitfalls such as air entrainment. (Feb 22)
- Using local hospital labs can be unreliable as time taken to release 'bad' results (Apr 22)
- If you are having to turn your gases up to get rid of CO2 and increase your pump speed to get normal blood flow, there is a high resistance circuit with impaired oxygenator function, suggesting oxygenator clotting. (May 22)

- Be wary of the difference between NRP and OrganOx – very different with regard to glucose handling and other indices. (May 22)
- Flow rate is empirical – titrate ideal flow by SV02. (Jun 22)
- Ensure all blood given is correctly prescribed/checked/signed for when given (Mar 23)

**Cold perfusion and organ retrieval**

- Potential to go on and do sequential OrganOx is something to bear in mind if a proportion of the parameters are ok but some go off. Individual team's expertise with NRP and OrganOx will dictate what should be done, bearing in mind that it is wise to be conservative early in the experience curve with new techniques. (Jan 22)
- If a liver is moving having been NRP'd important to prioritise handing liver over to transport (Mar 22)
- A liver biopsy can be performed for clinical quality and safety purposes (QC) in this situation, irrespective of QUOD etc. This could allow a more detailed understanding and perhaps avoid a repeat. If such livers go for research the researchers could be asked to 'open' the liver and assess clots etc. (May 22)
- Please ensure all boxes on the NRP Passport are completed. (May 22)
- Even if NRP cycle not completed please ensure the SNODs always take a copy of the NRP passport to email to the ODT Hub as per their SOP. (Jul 22)
- Only share pictures of organs if you have specific consent from the family for educational purposes (Mar 23)
- Be aware of possible complications of metformin associated lactic acidosis (MALA) for recipients on metformin (Jun 23)
- Consider icing the liver after 2 hours prior to going cold (Nov 23)

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