

TA-NRP

Update

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- **Question:** Does TA-NRP restore cerebral perfusion after diagnosing death using circulatory criteria in DCD?
- **Hypothesis:** If atmospheric or negative pressure is achieved in ligated end of innominate, left carotid and left subclavian, any retrograde spinal artery flow from NRP circuit will not reach sufficient pressure to perfuse the brain.
- If cerebral blood flow absent, there can be no cerebral perfusion and without perfusion there could be no cerebral function.
- Lack of measurable function does not necessarily exclude perfusion or flow particularly in low flow / ischaemia states, but an absence of flow excludes function.
- It is possible to monitor all these things but it's obviously more challenging during an organ retrieval.
- What about A-NRP? Less of a problem as the high anastomotic network in the spinal cord would suggest that by the time the medulla is reached by the spinal arteries there has been equalisation of the pressure to close to zero.

TA-NRP

Working group

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1. Brain blood flow study for current TA-NRP
2. Cardiac-abdominal NRP prototype

TA-NRP

Proposal

- CT-angio to confirm the absence of intracranial blood flow (posterior circulation).
- Additional modalities: Transcranial doppler (TCD) & Cerebral Oximetry (O3)
 - Is TCD reliable / accurate in non-pulsatile flow e.g. during cardiopulmonary bypass ?
 - TCD - we should have the same operator - loss of detectable pulsatile flow is a reliable indicator of absence of CBF, within the limitations of the modality.
- Lack of baseline: perform study blood flow in A-NRP.

Brain Blood flow study in A-NRP

Timings in DCD

- One centre only: Addenbrookes Hospitals, Cambridge.
- SNOD and study coordinator.
- Family consent.

T0: pre-WLST

T1: warm ischaemic time

T2: declaration of death

T3: After NRP established



Cerebral oximetry (O3)

TCD

TCD

CT-A

Brain Blood flow study

Challenges

- SNOD training.
- Extra personnel (study coordinator, radiographer, radiologist, TCD technician).
- Timing for CT-A (contrast and potential damage to kidneys).
- Total number of cases.
- Definition of no flow vs. Minimal flow.
- Family consent.

CT-angio

Initial protocol

- CTA Protocol
 - 50 mL IV contrast injected at 4 mL/sec
 - Scan at 60 seconds.
- Assessment- Frampas score
 - A 4 point score is assigned, 1 point for lack of contrast opacification in each of the following vessels:
 - Left internal cerebral vein
 - Right internal cerebral vein
 - Left cortical MCA branches
 - Right cortical MCA branches
- A score of 4 achieves a sensitivity of 87.5%-95.9% for brain death. This score is less reliable in patients with craniectomy.

Brain Blood flow study

Future steps

- Finalised brain blood flow study protocol
- Logistics in one trust
- RINTAG
- When to move to TA-NRP