Framework and Guidance for New Centres to ANRP

Background

The use of Abdominal Normothermic Regional Perfusion (ANRP) in the UK has developed steadily over the past decade. The technique was initially introduced in Cambridge and Edinburgh as research pilots, before progressing to an NHSBT sponsored service evaluation. This work demonstrated clear improvements in outcomes for livers and other abdominal organs recovered from DCD donors.

In response to these promising results, NHSBT—working alongside clinicians in Cambridge and Edinburgh and DH health economists—developed a national business case in 2018 to support full UK rollout. However, long-term funding was not secured at that time.

To provide oversight for the safe expansion of ANRP practice, the ANRP Steering Group was established by NHSBT in 2020, chaired by Chris Watson. The group developed a revised business case which was submitted to the four UK Health Departments in August 2021. This submission highlighted growing UK and international evidence of superior kidney and liver transplant outcomes when organs are recovered using ANRP. Despite the strength of this evidence, no formal response was initially received.

During this period, four additional NORS abdominal retrieval teams successfully began ANRP programmes under Steering Group oversight: the Royal Free Hospital (London), University Hospital of Wales (Cardiff), Queen Elizabeth Hospital (Birmingham), and the Freeman Hospital (Newcastle). This expanded the service beyond the original pioneering centres, increasing consistency of practice and contributing further to the evidence base.

A major milestone was achieved in 2025 with the successful approval of the ANRP business case by the UK Health Departments, securing substantive funding for a national rollout across all NORS abdominal retrieval teams. This decision enables the full implementation of ANRP across the UK and establishes long-term sustainability for the service.

Following this approval, implementation of ANRP has been successful in Kings College Hospital (London) and Oxford University Hospital (Oxford) with the remaining retrieval teams St James' Hospital (Leeds) and Manchester Royal Infirmary (Manchester) having completed preliminary training and are working towards confirmed start dates to achieve national delivery.

Funding

Following approval of the ANRP business case substantive funding was awarded to NHSBT by the UK Health Departments from April 2025, supporting a roll out of ANRP and it becoming part of the Commissioned NORS service from April 2027.

The additional funding represents a bolt on to the funded NORS service, supporting the additional NORS perfusion specialist role required for delivery of ANRP. Support for consumables will be reimbursed following teams confirming their monthly ANRP activity, as per the funding above. This has been agreed at a cost of

Non-Proceeding ANRP £1,800

To cover the following:

- Disposable perfusion circuit

Proceeding ANRP £2,560

To covers the following.

- Disposable perfusion circuit
  - Arterial and venous cannulas, with introducer kit
  - Aortic vent cannula
  - Piccolo biochemistry cartridges (5 per case)
  - Piccolo biochemistry calibration cartridges (2 per case)
  - iStat cartridges
  - iStat calibration cartridges

NHSBT will continue to fund one vehicle to transport a NORS team.

At the start of a new programme mentoring will be required from an experienced centre. NHSBT will fund the mentoring support as follows:

- Provision of transport for the mentor to and from the donor hospital
- Reimbursement of time spent mentoring at the rate of £89/hour.

Transport will be arranged by the Mentor.
Reimbursement for the mentor support is to be requested by the mentors Trust/Health Board to NHSBT as per the ANRP Clinical Mentorship-principles document.

Procedure for centres wishing to start or restart ANRP.

To ensure there is consistency of process and adequate governance regarding the use of ANRP across the UK the following framework should be followed.

Centres who are interested in developing ANRP within their Trust should consider the document in the following link. This provides a detailed overview of the responsibilities, knowledge base and competencies required by the individuals in an

ANRP team.

ANRP Structure training and competency

Following the funding announcement NHSBT (Service Development Team) have held regular meetings with Abdominal NORS teams to help support implementation planning for ANRP.

Preliminary Meeting

Centres wishing to start/restart the use of ANRP will have an initial telcon with members of the ANRP Implementation Group, a subset of the ANRP Steering Group, to discuss and agree the steps to be taken by the centre regarding:

- Equipment to be used.
- The training required for an ANRP team to start a programme.
- Provision of any proctoring support that may be required to support the training of surgeons.

The governance around safe use of ANRP, including surgeon and perfusion practitioner competence sign off and any initial restrictions for teams (e.g., kidney only donors)

The familiarisation and use of agreed national protocols for ANRP procedures, including the ongoing evaluation of the liver during ANRP UK Protocol for Normothermic Regional Perfusion (NRP) in controlled Donation after Circulatory Determination of Death.

- The familiarisation and use of the agreed national passport to capture relevant and necessary data to accompany the organs that have been perfused during the ANRP procedure. NRP Passport

- Consent guidelines for recipients where organs have been perfused using ANRP.
- NHSBT operational support regarding HUB/SNOD region training and transport.
- The expectation to debrief with the ANRP implementation group after each of the early cases and a willingness to engage with the monthly national ANRP debriefs.

Following the meeting, once all criteria have been addressed, the team should contact a member of the ANRP Implementation Group to arrange a date for the ANRP assessment.

Outline of the ANRP assessment

The assessment will be a 3 hr Microsoft Teams meeting with the expectation that the complete ANRP team attends (lead surgeon, assistant surgeon, perfusion practitioner, perioperative practitioner, cold perfusionist).

The assessment will be led by Ian Currie/Andrew Butler/Fiona Hunt and

attended by the other members of the ANRP Implementation Group - Debbie

Macklam/ Ben Cole/Sarah Beale

Guidelines for the assessment:

- The assessment will be a series of simulated ANRP retrievals, with each team member being required to contribute. All members of the ANRP retrieval team should to be in the same room together with all the paperwork that would be taken on retrieval, including blank paperwork which you will complete as you go along. It is advisable to have several sets of the passport available to record data as the assessment progresses.

- There will not be a direct test of machine setting up and therefore no requirement for the machine to be present. Centres are expected to have rehearsed this several times already and be fully proficient.

- It is advisable to have only the core ANRP team present at the assessment to avoid any distractions.

The roles should be allocated to the attendees – lead surgeon, assistant surgeon, perioperative practitioner, cold perfusion, ANRP practitioner. These individuals will be the focus of the assessment. The lead surgeon will retain overall responsibility for quality assurance of the team and all the paperwork and protocols and will be responsible for managing the donor on the pump in terms of interventions and interpretation.

The assessment will cover the full end to end ANRP pathway:

- Donor selection and considerations
- Mustering the team/SNOD info/Hub
- Equipment checks and loading
- Transport arrangements
- Set-up and checklists
- Bloods and blood tests
- Blood requirements
- Key points in the brief
- Prime and sash
- Cannulation
- Managing the donor on pump
- Going cold
- Going home

The assessment will also require the team to be prepared to discuss.

- Training records (of all team members)
- Competency documents (of all team members)
- Experience so far in training
- Quality considerations with blood monitoring kit
- Attendance at ANRP masterclass

- Role play scenarios of ANRP to assess knowledge base and decision making of all members of the ANRP team.

Following the assessment, the team will receive feedback from the ANRP implementation group within 2 weeks. This will address any concerns and confirm an agreed start date for the new ANRP programme with the appropriate mentoring that is deemed to be required.

For example: Agreed start date of X, initially to attend kidney only donors within local area of Y, to have mentors attending in person to support.

Mentoring

Any team looking to start a new ANRP programme will have the support of an approved ANRP mentor.

An approved mentor will be identified from an established centre. Such centres have a higher level of ANRP activity, have a proven record of ANRP sustainability and are less likely to be affected by the demands of mentorship.

Expectations of a mentor are found in the ANRP Clinical Mentorship-principles document The approved mentor list will be maintained by NHSBT.

When a mentor attends to provide support to an ANRP Team the governance for the retrieval remains with the retrieving NORS team. Feedback from the mentor will be collected by NHSBT using the ANRP Feedback template.

An established ANRP centre is one which has been granted established centre status by the ANRP Implementation Group. At this time (Jan 2026), Cambridge, Edinburgh, and Cardiff are considered the only established ANRP centres in the UK by the ANRP Implementation Group.

It is acknowledged that a lack of mentor availability may impact on the number of opportunities a centre has to use ANRP. Nevertheless, it is crucial to ensure mentor support is available before proceeding to use ANRP to avoid loss of donors or organs.

Once a NORS team has a start date for ANRP, they will begin with direct mentoring and work their way through the steps of mentorship until they reach independent ANRP practice.

Step 1 – Direct Mentoring

The team being directly mentored.

- Should create a WhatsApp group with approved mentors from Edinburgh, Cambridge or Cardiff, Ian Currie, and all members of their team.
- Should acknowledge that rota commitments in the approved mentoring centre (Edinburgh, Cambridge, and Cardiff) may restrict the number of opportunities for direct mentorship to undertake an ANRP.
- Should inform the relevant mentor(s) of any potential ANRP case as early as possible to allow identification of the appropriate mentor and time to travel.

- Must inform the ANRP WhatsApp group if the patient has had previous abdominal or cardiothoracic surgery or any anatomical variant, as this may affect operative strategy and cannulation.
- In a non-liver transplanting centre ANRP must be undertaken on a kidney only donor on at least the first occasion
- ANRP may be performed in a liver donor as a mentored case only when the liver has been accepted by the ANRP/liver transplant centre.
- Should not consider any cases with cardiothoracic involvement at this time unless it is possible to have an experienced mentoring surgeon and perfusion practitioner to support on site in theatre. These are not ideal cases to learn on.
- May join the mentoring centre's NORS team to perform ANRP. However, joining any other NORS teams for this purpose is not supported.
- Have an obligation to debrief within their own local team and also with the ANRP implementation group at the earliest opportunity.

The mentors

- An approved mentor will be identified from an established centre. Such centres have a higher level of ANRP activity, have a proven record of ANRP sustainability and are less likely to be affected by the demands of mentorship.
- Should feedback to ANRP Implementation Group representatives on progress completing the email request following each retrieval from the ANRP Implementation Group using the ANRP Feedback template.
- Make a recommendation to ANRP Implementation Group representatives when the team can move to indirect mentoring, which will be only after they are satisfied with the centre's ANRP team's abilities.
- Refer to ANRP Clinical Mentorship-principles document for details.

Step 2 – Indirect Mentoring

Indirect mentoring is the virtual presence of an experienced ANRP surgeon +/- perfusionist to support the retrieving team.

Indirect mentoring can only start once the ANRP Implementation group representatives have approved this in writing.

The indirectly mentored team

- Should inform WhatsApp group of the potential ANRP case as soon as possible and identify who is available to mentor remotely. ANRP should not proceed without an identified mentor agreeing to be available for supporting

the whole procedure.

- Must inform the ANRP WhatsApp group if the patient has had previous abdominal or cardiothoracic surgery or any anatomical variant, as this may affect operative strategy and cannulation.
- Should not consider any cases with cardiothoracic involvement at this time unless it is possible to have an experienced ANRP surgeon and perfusion practitioner on site to support in theatre.
- Should debrief with ANRP Implementation Group representatives or on the National ANRP debriefs.
- Can request to retrieve using ANRP outside of their normal retrieval areas if they are to be in receipt of one of the organs.
- May join the mentoring centre's NORS team to perform NRP. However, joining other NORS teams for this purpose is not supported.

The mentors

- An approved mentor will be identified from an established centre. Such centres have a higher level of ANRP activity, have a proven record of ANRP sustainability and are less likely to be affected by the demands of mentorship.
- Should feedback to ANRP Implementation Group representatives on progress using the ANRP Feedback template.
- Make a recommendation to ANRP Implementation Group representatives when, in their judgement, the team no longer needs direct or indirect mentoring.
- Refer to ANRP Clinical Mentorship-principles document for details.

Step 3a – Independent ANRP practice

Attendance at abdominal only donors

- Are encouraged to utilise experience of the WhatsApp group to discuss any complex cases which arise, such as those with previous abdominal or cardiothoracic surgery or any anatomical variant, as this may affect operative strategy and cannulation.

- May join any established team (currently Cambridge, Edinburgh, and Cardiff, i.e., not just the original mentoring team) to perform ANRP when the liver has been accepted by either the newly independent team or the experienced ARNP NORS team. The extent of the involvement of the visiting ANRP NORS team will be agreed between the experienced ANRP NORS surgeon (who has overall responsibility for the retrieval) and the visiting ANRP NORS surgeon, in advance of the retrieval.

Must debrief with ANRP Implementation Group representatives or on the National ANRP debriefs when asked.

Step 3b – Independent ANRP practice

Attendance at multi organ donors with Cardiothoracic teams

Attendance at abdominal only donors with another NORS abdominal team

- Can consider attending DCD donors with cardiothoracic involvement to use ANRP, but only when there are two experienced ANRP surgeons able to attend. Must debrief with ANRP Implementation Group representatives or on the National ANRP debriefs when asked.
- Teams can consider sending an ANRP surgeon and advanced perfusion practitioner to an abdominal only retrieval being facilitated by another NORS abdominal team on the following proviso:
    - The centre providing ANRP has accepted the liver themselves.
    - The ANRP centre should initially perform this with one particular NORS team in order to establish their competence with combined team retrievals.
    - A conversation must be held between ANRP surgeon and allocated abdominal NORS team prior to departure from base to ensure they support this prior to each retrieval.

Refer to the “Principles for ANRP retrieval” document for further considerations, e.g., it must not be detrimental to the commissioned service and travel cost implications should be borne by the NRP centre.

- Until a centre has established status their team would not be supported to mentor new centres starting their own ANRP programmes, run ANRP courses or undertake TANRP.
    - If a centre wishes to provide NRP courses suitable for practice in the UK, they will need to fulfil the national learning objectives and syllabus (in preparation). A centre can provide such NRP courses prior to fulfilment of these requirements if they do so in collaboration with an established centre.
- Currently TANRP is restricted to Papworth and Addenbrookes NORS teams under governance of a research study.

Step 4 – Recognised as an established ANRP centre

An established ANRP centre is one which has been granted established centre status by the ANRP Implementation Group

The ANRP Implementation Group will consider the following in order to grant established ANRP centre status.

- ANRP attendances of greater than 50% on a consistent basis
- commitment to safety
- governance and damage free retrievals
- good practice and the positive reputation of ANRP

- mentoring feedback
- participation in feedback meetings
- Participation in national training programmes (i.e., Masterclass/cadaveric)

Current centres recognised as an established ANRP Centres (as of January 2026) are Edinburgh, Cambridge, and Cardiff.

Once a centre becomes recognised as an established ANRP centre the surgeons will be expected to join a rota to chair the monthly national debriefs to ensure ongoing learning opportunities are maximised.

Debriefs

As mentioned above, it is expected that each new centre using ANRP will make themselves available for a debrief with the ANRP implementation group as the earliest opportunity post retrieval.

A national ANRP debrief will be held monthly, with all abdominal NORS teams invited, as an opportunity to share practice.

Due to the complexities of CT and abdominal retrievals using ANRP, debriefs are also held for any cases involving both DCD heart or lung and ANRP.

Following each debrief notes will be shared with the group, the level of mentoring will be reviewed, and any changes will be communicated.

Updates

Update 26/01/2026

- Updated sections – background, funding, implementation group member
- Clarification on stage 4 – Established centres and mentoring documents.

Abbreviations

ANRP: Abdominal *in situ* normothermic regional perfusion

CT: Cardiothoracic

DCD: donation after circulatory death

NORS: National Organ Retrieval Service

NRP: in situ normothermic regional perfusion

TA-NRP: thoraco-abdominal NRP

Updates

Update 26/01/2026 v15

- Updated sections – background, funding, implementation group member
- Clarification on stage 4 – Established centres and mentoring documents.