Clinical Standard Operating Procedure (SOP)

STROKE THROMBECTOMY

SETTING	Service-wide
FOR STAFF	All staff
PATIENTS	Patients requiring mechanical thrombectomy for ischaemic stroke

Introduction

Mechanical thrombectomy (MT) for ischaemic stroke is provided by North Bristol NHS Trust and University Hospitals Plymouth NHS Trust for patients within the South West within two Integrated Stroke Delivery Networks. The West of England ISDN and NBT MT network cover the Severn region of Retrieve and the SW Peninsula ISDN and UHP MT network cover the Peninsula region.

The aim of MT networks is to facilitate rapid patient transfer and safely minimise the time between onset of ischaemic stroke and reperfusion. Whilst much of this can be addressed by improving processes within acute stroke centres (referring hospitals), communication and within MT centres, there is perceived benefit in streamlining the time critical referral of these patients.

Retrieve have agreed to work with NHS England, the West of England and Peninsula ISDNs and the NBT and UHP MT networks to improve the coordination and delivery of these time critical transfers.

Transfer of patients requiring MT

Patients requiring transfer between hospitals to receive MT are time critical. The majority (around 90%) require a time critical 999 SWASFT ambulance with a paramedic. Most patients receive IV rtPA which takes approximately 1 hour to deliver via infusion and, if this is to continue and complete during the transfer, these patients require an appropriately trained nurse escort from the acute stroke centre.

Around 10% of MT patients require a critical care transfer. These include patients:

- Requiring blood pressure manipulation (up or down)
- Requiring, or likely to require, airway support owing to a low GCS
- Requiring ongoing seizure management
- With basilar infarcts who are significant risk of deterioration
- With vertebral artery dissection (who are at significant risk of deterioration).

Retrieve are uniquely placed to improve the triage and coordination of these transfers, ensuring the most appropriate resource is deployed (a SWASFT Category 2 time-critical ambulance or Retrieve team) as well as the most appropriate clinical escort is provided (paramedic, nurse from Acute Stroke Centre (ASC), critical care escort by referring hospital or Retrieve).

Note that basilar infarcts and vertebral artery dissection patients (who are at significant risk of deterioration) may not be widely recognised as requiring a critical care escort by referring hospital critical care and anaesthesia staff.

The process for coordination was initially piloted in the West of England ISDN from December 2021 to July 2022 before being rolled out to cover the South West Peninsula ISDN in August 2022. It will operate throughout the thrombectomy hours in both Derriford and Southmead.

Referral process

Patients referred to Retrieve for coordination of time critical transfer will **all have been accepted by the MT centre stroke physician and/or interventional neuroradiologist on-call (depending on Derriford and Southmead processes).** Following this decision, the stroke physician or interventional neuroradiologist will notify the referring hospital of this acceptance using the Referapatient system and request that they immediately contact Retrieve. This route has been implemented following feedback on the initial approach which used call conferencing. This new pathway is anticipated to reduce the complexity and improve the efficiency of the process.

North Devon District Hospital

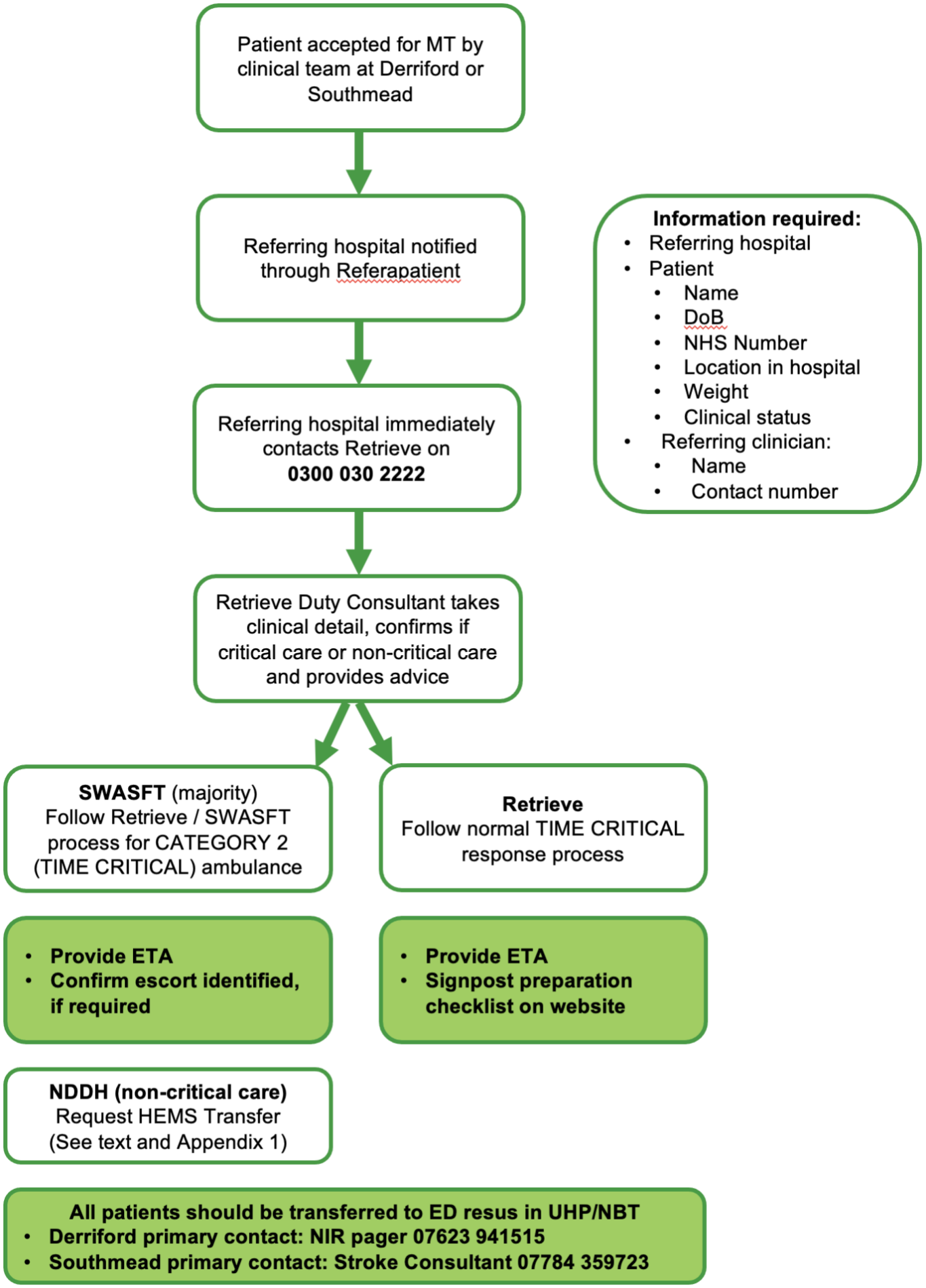
NDDH has an agreement with Devon Air Ambulance (DAAT) that, if certain criteria are met, air transfer of patients accepted for MT will be considered.

When receiving a referral from NDDH, if the patient does not require critical care escort and meets the following criteria, the Retrieve Duty Consultant will request a HEMS transfer and then confirm with the referring clinician whether air or land transfer has been arranged.

- Patient weight <120kg
- No airway compromise or at imminent risk of compromise
- Patient not agitated, combative, confused, and able to lie still and remain compliant during air transfer.

Patients with posterior circulation strokes are not included in this agreement given their higher risk of deterioration.

Referring clinicians from NDDH are asked to highlight this agreement when contacting Retrieve. The flowchart from the DAAT / NDDH SOP is found in Appendix 1 and includes instructions for how to activate DAAT.


Patient accepted for MT by clinical team at Derriford or Southmead
Referring hospital notified through Referapatient
Referring hospital immediately contacts Retrieve on 0300 030 2222
Retrieve Duty Consultant takes clinical detail, confirms if critical care or non-critical care and provides advice
Information required:
Referring hospital
Patient
Name
DoB
NHS Number
Location in hospital
Weight
Clinical status
Referring clinician:
Name
Contact number
SWASFT (majority)
Follow Retrieve / SWASFT process for CATEGORY 2 (TIME CRITICAL) ambulance
Retrieve
Follow normal TIME CRITICAL response process
Provide ETA
Confirm escort identified, if required
Provide ETA
Signpost preparation checklist on website
NDDH (non-critical care)
Request HEMS Transfer
(See text and Appendix 1)
All patients should be transferred to ED resus in UHP/NBT
Derriford primary contact: NIR pager 07623 941515
Southmead primary contact: Stroke Consultant 07784 359723

Clinical advice

Whilst the transfer of patients for MT is not new, the use of Retrieve to coordinate these transfers is. It is important that this process is used to not only improve the rapidity of transport allocation but also the clinical care delivered to patients ahead of transfer and en-route. It is anticipated that the majority of referring clinicians will be unfamiliar with Retrieve or critical care transfer.

It may be appropriate to offer some, or all, of the following advice:

- For all patients:
  - Emphasise the time criticality of the preparation and transfer
  - Encourage pre-transfer preparation, in line with the 'Referring to Retrieve' SOP
  - Ask for patient to be made 'nil by mouth'
  - Encourage discussion about rtPA infusions – these cannot be continued with a paramedic only escort (they are not authorised to use or trained on infusion pumps), so the infusion either needs to be completed or stopped unless a nurse escort is provided. This may require a pragmatic decision by the responsible clinician about the risks and benefits of any delay compared with the risks and benefits of expedited transfer by stopping the infusion early.
- For those identified as requiring critical care transfer (see above on Page 1):
  - Encourage (and support, as required) early and proactive conversation with local critical care unit / anaesthesia team when Retrieve are unavailable or offline overnight
  - Provide sufficient information to ensure critical care is commenced as soon as possible – including airway management, seizure management and blood pressure control (see below).

MT centre contacts

Peninsula

- Duty interventional neuroradiologist pager at Derriford on 07623 941515 (leave message asking to call back immediately).
- If this person is not contactable please the Stroke Nurse on 07584531660 (or pager 1909 via UHP switchboard) or Stroke Registrar (pager 1908) via UHP switchboard 01752 202 082

Severn

- Stroke Thrombectomy phone at NBT 07784 359723 (or 'Thrombectomy Consultant on-call' via NBT switchboard 0117 9505050).
- If this person is not contactable, use Stroke Consultant bleep 1290 or Stroke Registrar bleep 1490 or Neurology Registrar bleep 1636 via NBT switchboard 0117 9505050.

Transfer care

Usual critical care transfer principles apply to the treatment and transfer of these patients. The Association of Anaesthetists 'Safe transfer of the brain injured patient' guidelines from 2019 provide useful physiological parameters to aim for in acute ischaemic stroke:

- Systolic blood pressure:
  - If received rtPA: >140, <185mmHg
  - If not received rtPA: >140, <220mmHg
  - For hypotension: fluids and vasoconstrictors
  - For hypertension: labetalol infusion
- Ventilatory parameters:
  - SpO2 ≥95% (add O2 only if <95%)
  - $PaCO_2$ (if ventilated) 4.5-5.0kPa

Handover

The exact destination of patients being transferred for MT will be stated in the Referapatient reply to the referring hospital when the patient is formally accepted. Usually, it will be the Emergency Department so that time-critical imaging and rapid assessment can be carried out.

- Peninsula: all patients to UHP should be transferred to the Emergency Department where they will be met by the Stroke Team and Neuroradiologist. A member of the UHP Stroke or Neuroradiology team will guide the escorting team from ED to the neurointerventional suite.
  - ED resus is first on the left after entering through the ambulance entrance.
  - The neurointerventional suites (IR rooms 4 and 6) are on level 6, X-Ray East.
- Severn: all patients to NBT should be transferred to the ED where they will be met by the Stroke Team.
  - ED resus is first on the left after entering through the ambulance entrance.
  - The neurointerventional radiology suite (IR Room 4) is located on Level 2 adjacent to Main Theatres.

A focussed handover must be given to the team present (radiology, stroke, anaesthesia) in line with the 'Handover' SOP. Pertinent details that should be included are:

- Time of onset of symptoms (or wake time)
- Treatments prior to Retrieve arrival (including thrombolysis)
- Treatments en-route
- Current GCS and any other relevant physiology

Review of process and cases

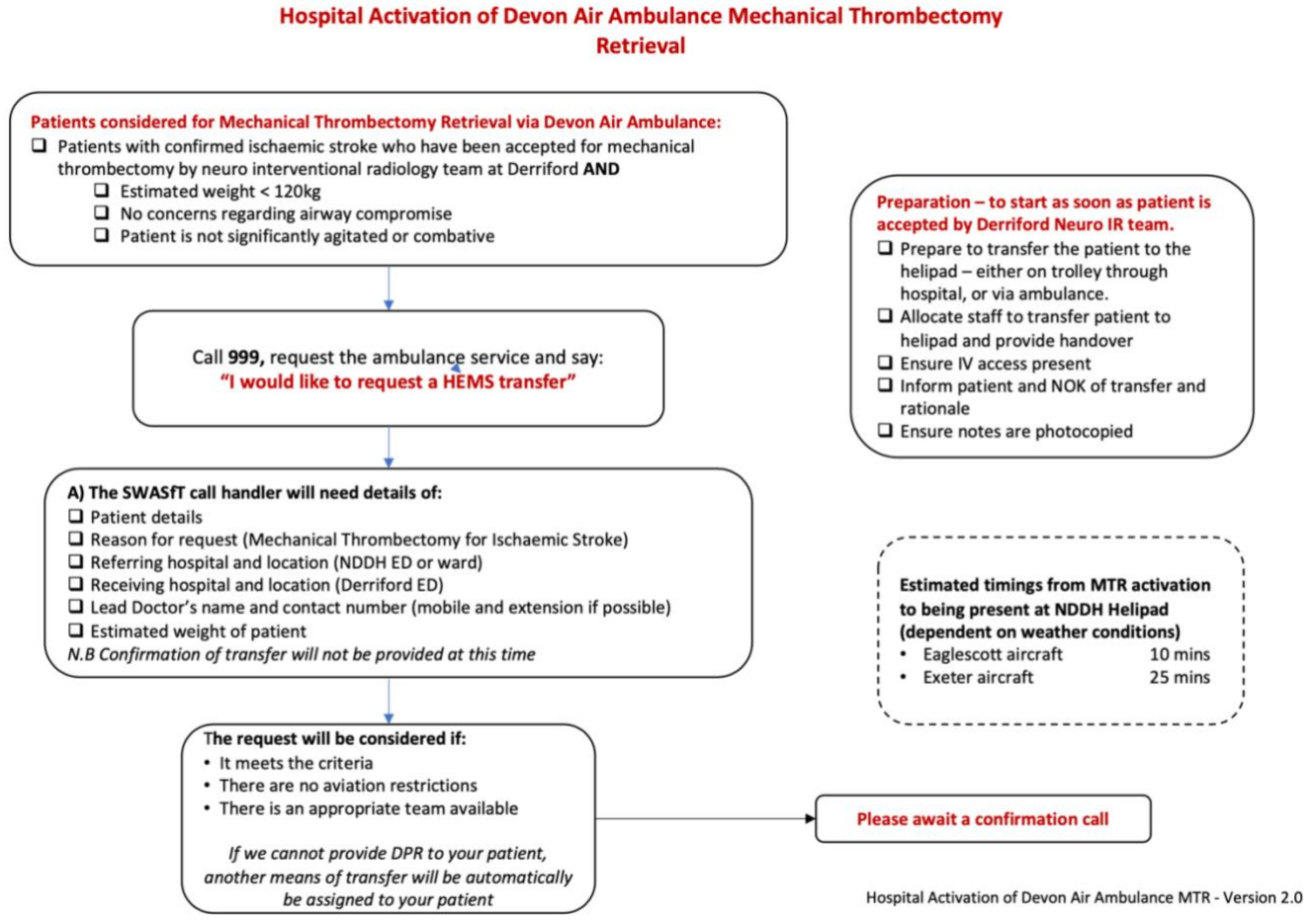
This process has been refined since the initial pilot launched in December 2021. Working with the West of England and South West Peninsula ISDNs and NHS England, activity will continue to be reviewed with a quarterly activity report generated and circulated.

In line with existing Retrieve processes, individual feedback will be sought for each case, learning points disseminated to the Retrieve team and other hospitals (as necessary), and refinements considered.

Document Governance

REFERENCES	1. Association of Anaesthetists and Neuro and Anaesthesia Critical Care Society, 2019. Safe transfer of the brain injured patient: trauma and stroke, 2019. https://associationofanaesthetists-publications.onlinelibrary.wiley.com/doi/epdf/10.1111/anae.14866 (accessed 26/11/21)
RELATED DOCUMENTS AND PAGES	
AUTHORISING BODY	Division of Surgery, University Hospitals Bristol & Weston NHS Foundation Trust
SAFETY	
QUERIES AND CONTACT	Retrieve Leadership Team

Appendix 1 – DAAT & NDDH MT air transfer flow chart



DAAT Mechanical Thrombectomy Retrieval (MTR) SOP, version 1.1