HYPERACUTE STROKE – THROMBOLYSIS AND THROMBECTOMY PATHWAY

TARGET AUDIENCE	Stroke Nurses, ED Physicians/ANPs, Radiography/Radiology Clinicians and Stroke Physicians
PATIENT GROUP	Hyperacute Ischaemic Stroke

Contents:

Clinical Guidelines Summary:

- **In line with the rest of the UK and Scotland, NHS Lanarkshire is moving to using Tenecteplase instead of Alteplase for Hyperacute Stroke presenting within 4.5 hours of symptom onset.**

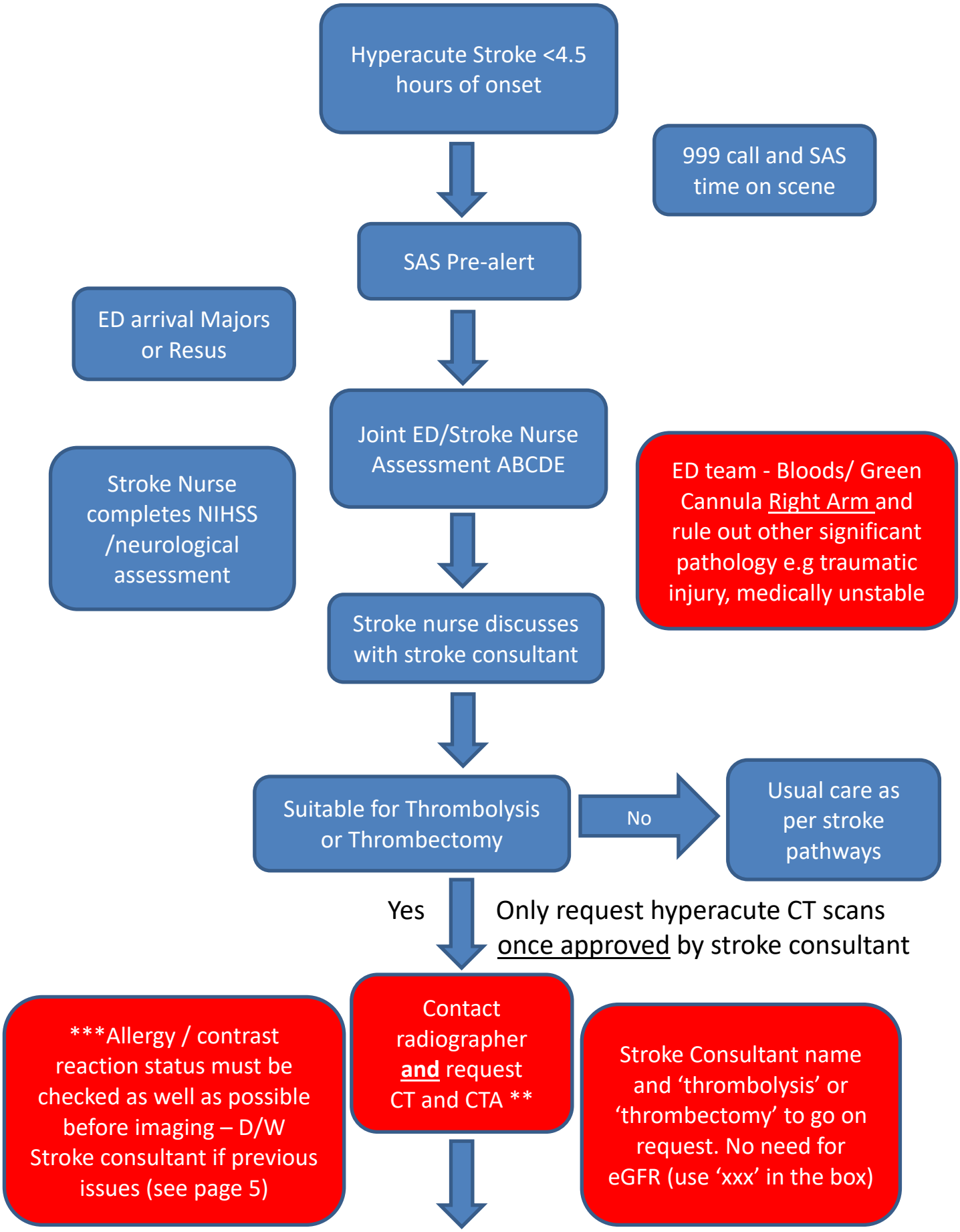
- **This document describes the current thrombolysis/thrombectomy pathway, imaging acquisition and thrombolysis.**

- **It includes a chart of Tenecteplase doses by weight and also instructions on how to administer the drug.**

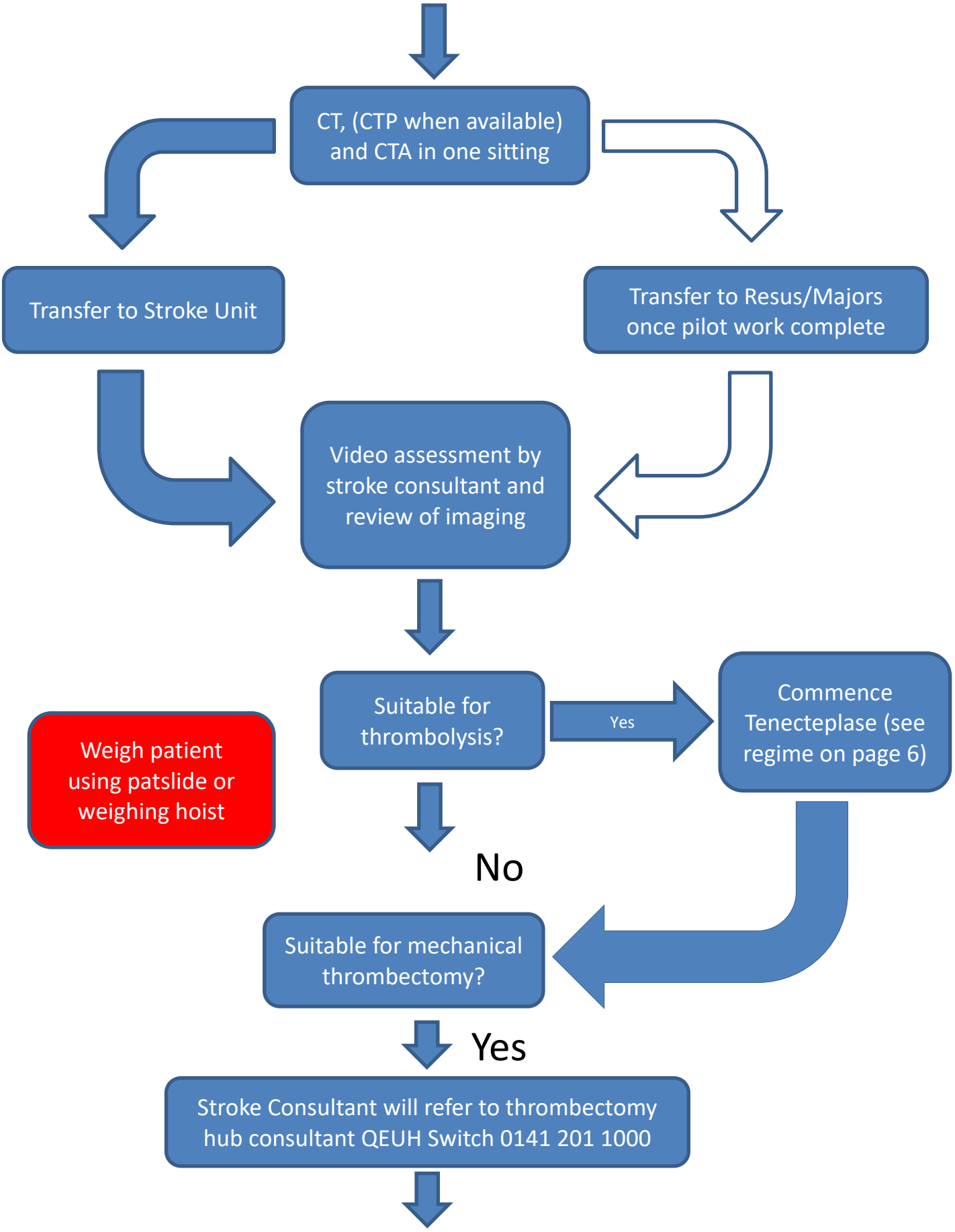
- **Patients with a CONFIRMED GENTAMICIN ALLERGY should not receive tenecteplase due to trace residue from the manufacturing process – cross contamination. ALTEPLASE should be used as an alternative – refer to Hyperacute stroke - alteplase guidance for patients requiring thrombolysis - alternative to tenecteplase**

- **Tenecteplase use in patients with Myasthenia Gravis should be used with caution – risk vs. benefit. This is due to the gentamicin content within tenecteplase which raises concerns with causing clinically significant muscle weakness, resulting in respiratory depression. ALTEPLASE should be used as an alternative – refer to – Hyperacute stroke - alteplase guidance for patients requiring thrombolysis - alternative to tenecteplase**

Hyperacute Stroke – Thrombolysis and Thrombectomy Pathway

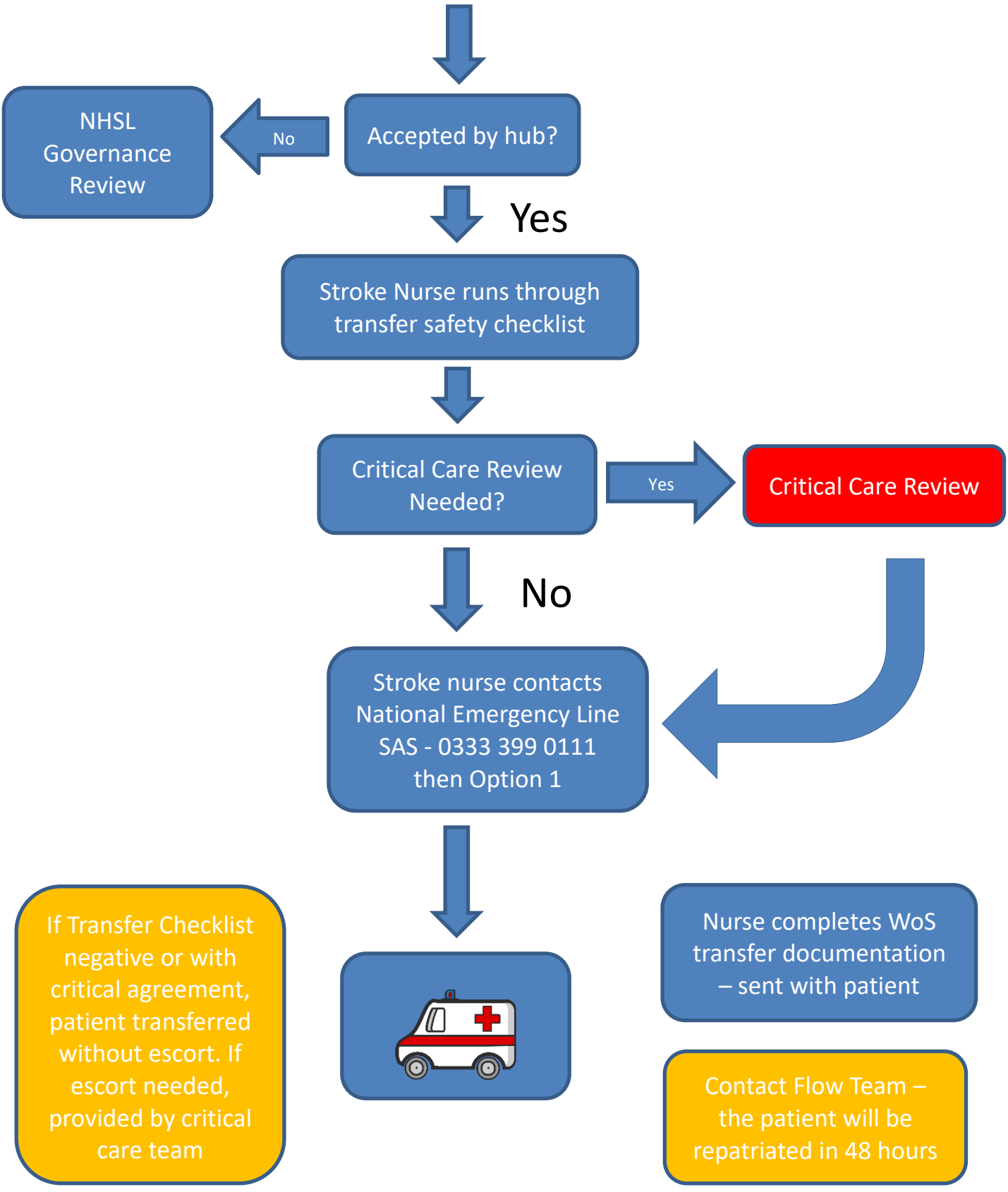


Hyperacute Stroke – Thrombolysis and Thrombectomy Pathway



Lead Author	**Prof Mark Barber**	**Date approved**	**22nd January 2025**
Version	**1.7**	**Review Date**	**31st August 2026**

Hyperacute Stroke – Thrombolysis and Thrombectomy Pathway



** Imaging Requesting:

- **Request CT Brain AND**
- **Request CT Angio Aortic Arch and Carotid both**

The request must include the on call stroke consultant's name and that the patient is for potential thrombolysis or thrombectomy

- **Check allergy status as thoroughly as possible with ECS and patient/family if possible. D/W stroke consultant before performing imaging if previous issues.**

eGFR is not required for thrombolysis/thrombectomy imaging. Enter 'XXX' in the box. If known renal issues D/W stroke consultant before requesting

*** Previous Allergy Contrast Reactions:

- **Previous contrast reactions may be identified by the patient, listed as an allergy in ECS or recorded on the NHSL radiology system**
- **If there is a history of previous contrast reaction, do not request or perform CTP or CTA until discussed with Stroke Consultant**
- **In some circumstances, Non-contrast CT may be enough (e.g. if patient not suitable for thrombectomy)**
- **In patients with a previous mild contrast reaction, the risks of further reaction may be outweighed by the potential benefits of thrombectomy. This would only go ahead though after a discussion with the patient and/or NOK about the pros and cons.**
- **In a patient with a confirmed history of contrast allergy, the CTA/CTP would only then be requested by the stroke consultant remotely on TRAKCARE.**
- **Thrombectomy itself requires large volumes of contrast, so it unlikely that a patient who has had a previous severe contrast reaction would be suitable for thrombectomy**

Tenecteplase Contraindications [2]:

ABSOLUTE CONTRA-INDICATIONS

- Symptoms beginning more than 4 ½ hours prior to infusion start or when time of symptom onset is unknown (unless advanced CT perfusion imaging suggests salvageable penumbra)
- Symptoms suggestive of subarachnoid haemorrhage, even if CT scan is normal
- Evidence of intracranial haemorrhage (ICH) on the CT scan
- Manifest or recent severe or dangerous bleeding
- Known clotting disorder
- Patients receiving new oral anticoagulants, e.g., Apixaban, Dabigatran and Rivaroxaban and who are compliant with prescription.
- Patients receiving Warfarin unless INR ≤ 1.7
- Patients with confirmed or high clinical suspicion of bacterial endocarditis
- Suspicion of acute aortic dissection, until dissection excluded
- Patients with a known/confirmed allergy to gentamicin

RELATIVE CONTRA-INDICATIONS – these are only relative contraindications. If benefits still appear to outweigh risks, treatment can still go ahead provided that the patient or carer accepts the increased bleeding risk.

- Systolic blood pressure > 185 or diastolic BP > 110 mm Hg, or aggressive management (IV medication) necessary to reduce BP to these limits. Using IV medication to reduce BP to these targets is out with the product licence.
- Patients receiving new oral anticoagulants, e.g., Apixaban, Dabigatran and Rivaroxaban and the patient is known to be non-compliant.
- Known history of, or suspected, intracranial haemorrhage
- Administration of IV heparin within the previous 48 hours AND an APTT exceeding the upper limit of normal.
- Treatment dose LMWH
- Any history of central nervous system damage (i.e. neoplasm, intracranial or spinal surgery)
- Recent (less than 10 days) traumatic external heart massage, obstetric delivery or puncture of a non-compressible vessel.
- Pericarditis
- Acute pancreatitis
- Documented ulcerative gastrointestinal disease during the last 3 months
- Neoplasm with increased bleeding risk
- Severe liver disease, including hepatic failure, cirrhosis, portal hypertension (oesophageal varices) and active hepatitis
- Major surgery or significant trauma in past 1 month
- Minor neurological deficit (NIHSS ≤ 4) or symptoms rapidly improving before start of infusion
- Pre-presentation Rankin Score ≥ 4 indicating significant disability, especially if due to previous stroke.
- Seizure at onset of stroke
- Platelet count of below 100 x 10^9/L
- Uncorrected blood glucose < 2.8mmol/L
- Patients diagnosed with myasthenia gravis. Gentamicin residue in the manufacturing process may impair neuromuscular transmission in this cohort.

Tenecteplase [3][4] Administration:

Tenecteplase for treating ischaemic stroke is available as a 5000unit (25mg) vial. Administer as a single IV bolus over 5 to 10 seconds. The dose is weight dependent and the maximum dose is 25mg.

Calculate the dose based on the patient's actual body weight.

Benefit-risk of Tenecteplase treatment should be carefully evaluated in patients weighing 50kg or less due to limited evidence. The weight-band table is derived from the AcT trial [3] and there was no evidence of any safety issues identified when following that dosing schedule. For myocardial infarction the lowest weight band is also <60kg and there have been no safety issues identified for using this lowest dose for all patients, no matter how far less than 60kg. If there is an individual safety concern in a patient <60kg, then a calculation could be made on the 0.25mg/kg basis, but this introduces risk around both the calculation and the accuracy of syringe measurement at such low volumes.

Patients' body weight category (kg)	Tenecteplase (mg))	Corresponding volume of reconstituted solution (ml)
< 60	**15.0**	**3.0**
≥ 60 to < 70	**17.5**	**3.5**
≥ 70 to < 80	**20.0**	**4.0**
≥ 80 to < 90	**22.5**	**4.5**
≥ 90	**25.0**	**5.0**

Details on how to prepare the drug can be found at https://go.boehringer.com/RTz and a training video is available at - https://go.boehringer.com/R95yZ .

If not opening directly on a NHSL device, then copy and paste into Chrome browser. This guideline will be formally reviewed at a minimum annually to ensure links are still functioning correctly.

References/Evidence:

1. **National Clinical Guideline for Stroke for the UK and Ireland - Acute care - National Clinical Guideline for Stroke**
2. **Tenecteplase SPC: https://www.medicines.org.uk/emc/product/15859/smpc#gref (Accessed 03/04/2025)**
3. **NICE - Tenecteplase for treating acute ischaemic stroke Technology appraisal guidance Reference number TA990 Published: 24 July 2024**
4. **Menon K et al. Intravenous tenecteplase compared with alteplase for acute ischaemic stroke in Canada (AcT): a pragmatic, multicentre, open-label, registry-linked, randomised, controlled, non-inferiority trial. Lancet 2022 Jul 16;400(10347):161-169**

Appendices:

1. **Governance information for Guidance document**

Lead Author(s):	Mark Barber
Endorsing Body:	Stroke MCN
Version Number:	1.7
Approval date	January 2025
Review Date:	August 2026
Responsible Person (if different from lead author)	

CONSULTATION AND DISTRIBUTION RECORD	
Contributing Author/Authors	
Consultation Process/Stakeholders:	All stroke physicians. ED Stroke Leads. All stroke Senior Charge Nurses. Critical care – governance group. Regarding the radiology aspects of the pathway, these have been agreed in the Thrombectomy SLWG chaired by Claire Robertson and including a number of radiologists and radiographers from all three NHSL acute sites

CHANGE RECORD			
Date	**Lead Author**	**Change**	**Version**
01.11.24	Barber	Initial submission 1.11.24	1
27.11.24	Barber	1. ADTC requests - shrink pathway to one page, fix one spelling error, replace brand names, clarify strength of tenecteplase and add to text above table, rephrase 'if critical care happy' 2. Added advice from local (and world) expert on treating those less than 50kg	2
31.12.23	Barber	1. Reversal of initial ADTC request to shrink flowchart to one page (became too small) 2. Reference personal communication from Prof Muir on treating patients less than 50kg 3. Shortened review date to maximum 12 months so links to training pages are kept up to date.	3
22.01.25	Barber	1. Spelling correction in flowchart 2. Add appendix with correspondence from Prof Keith Muir.	4
15.02.25	Barber	Improvements to the advice on low weight patients	5
20.02.25	Barber	Formatted References	6
03.04.25		Table of contents added, safety concerns for tenecteplase added, alteplase guidance linked, formatting changes, addition of tenecteplase contraindications, references updated.	7

2.You can include additional appendices with complimentary information that doesn't fit into the main text of your guideline, but is crucial and supports its understanding.