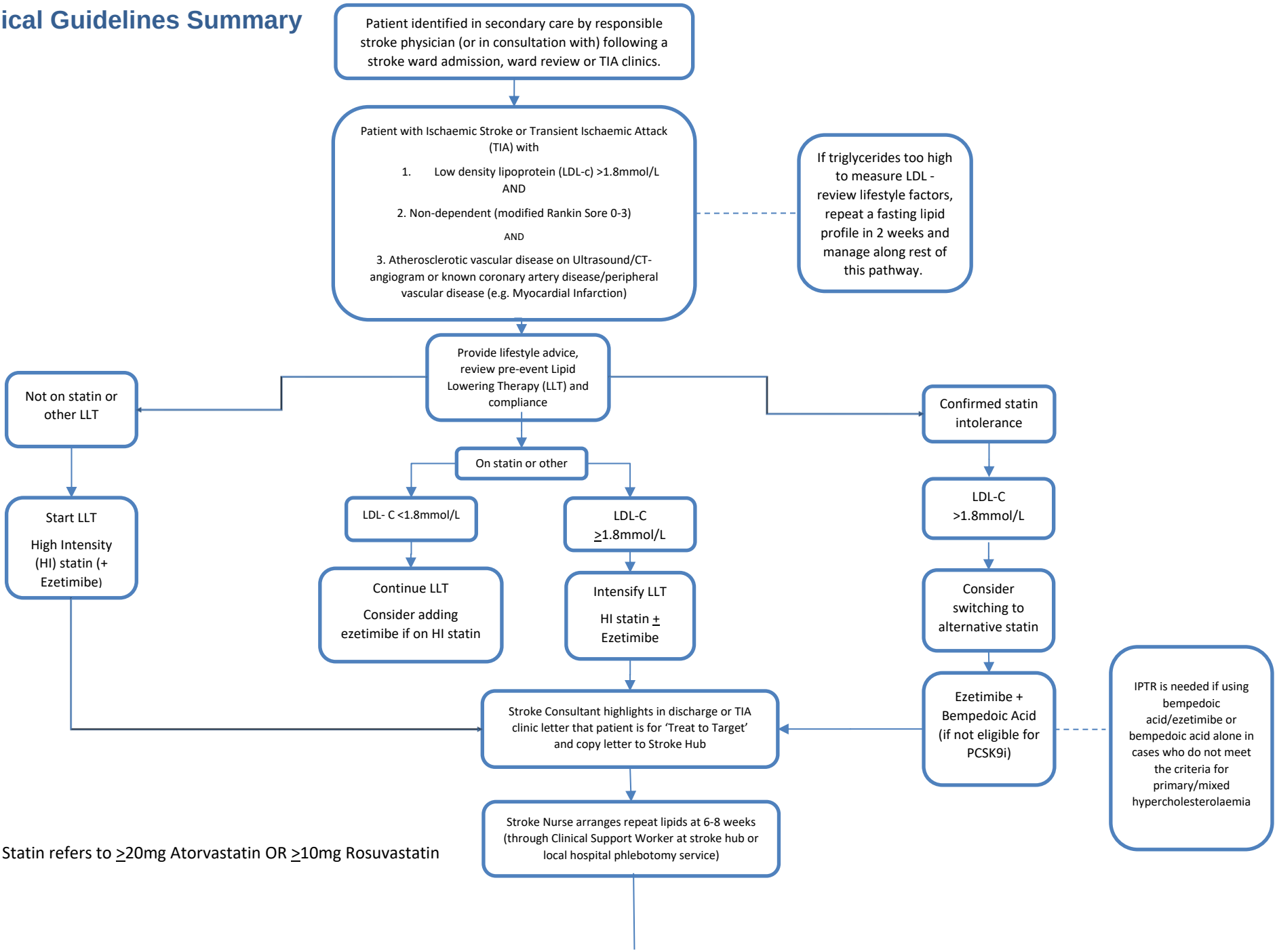
LOW DENSITY LIPOPROTEIN CHOLESTEROL MANAGEMENT IN HIGH-RISK ISCHAEMIC STROKE/TRANSIENT ISCHAEMIC ATTACK (TIA) PATIENTS

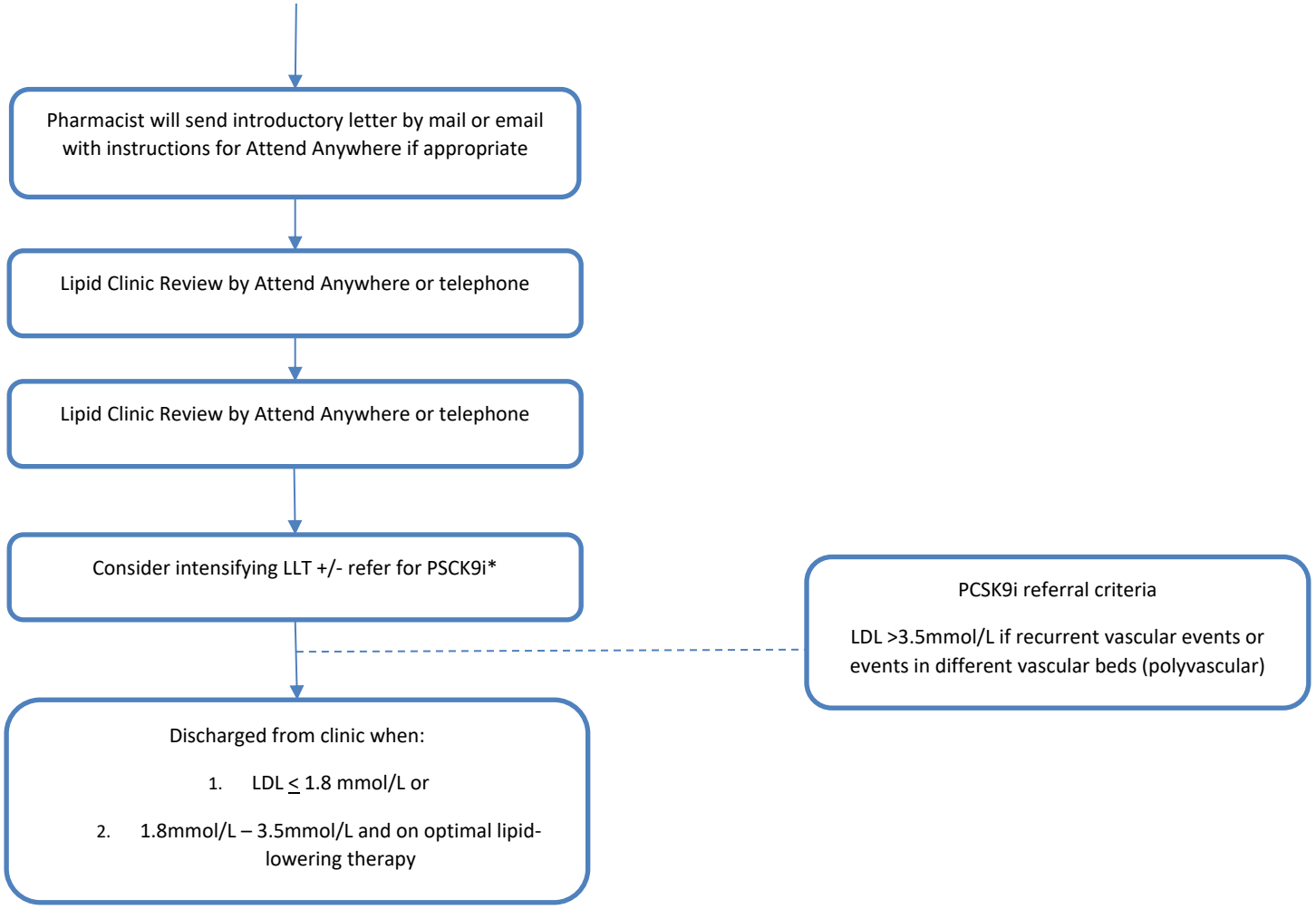
TARGET AUDIENCE	Stroke Medicine Physicians, Pharmacists working in Stroke Wards, Stroke Specialist Nurses
PATIENT GROUP	Non-dependent Ischaemic Stroke/TIA patients with a low-density lipoprotein cholesterol level of >1.8mmol/L who also have evidence of carotid plaque and/or established ischaemic heart disease and/or peripheral vascular disease (i.e high-risk ischaemic stroke patients)

Clinical Guidelines Summary



High Intensity Statin refers to ≥20mg Atorvastatin OR ≥10mg Rosuvastatin

LDL-Cholesterol Management in High-Risk Ischaemic Stroke/TIA



Contents

1. Who is this guideline intended for?

This guideline is intended for use by NHS Lanarkshire Stroke Physicians, Pharmacists working within Stroke wards and NHS Lanarkshire Specialist Stroke Nurses.

This guideline is to be used specifically and only in patients with a stroke or a TIA who meet the criteria detailed below and who have been referred by the responsible stroke clinician. It is separate from the NHS Lanarkshire Lipid Management Clinic.

2. Glossary of abbreviations

ACVD	Atherosclerotic Cardiovascular Disease
CT-angiogram	Compute Tomography Angiogram
HI	High Intensity
IPTR	Individual Patient Treatment Request
LDL-C	Low Density Lipoprotein Cholesterol
LLT	Lipid Lower Therapy
NICE	National Institute for Health and Care Excellence
PCSK9i	Proprotein Convertase Subtilisin/Kexin Type 9 inhibitor
SMC	Scottish Medicine Consortium
SPARCL Trial	Stroke Prevention by Aggressive Reduction in Cholesterol Levels Trial
TIA	Transient Ischaemic Attack
TST Trial	Treat Stroke to Target Trial

3. Background

1. Low-Density Lipoprotein Cholesterol (LDL-C) increases the risk of cardiovascular disease. In population studies it has been shown to contribute to up to 1 in 3 ischaemic strokes. As a population attributable risk factor it ranks secondary to hypertension in the top ten modifiable risk factors for stroke (Interstroke Study)[1].

2. The Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) trial has shown that lowering LDL-C in ischaemic stroke patients by using high intensity statins significantly lowers the risk of future cardiovascular events including stroke, myocardial infarction and peripheral vascular disease with an absolute risk reduction of 20.4% (i.e. a number needed to treat of 5)[2].

3. The "Treat Stroke to Target" (TST) trial has shown that major adverse cardiovascular events are significantly lowered when high risk ischaemic stroke or TIA patients have their LDL-C lowered to 1.8mmol/L[3].

4. High-risk Ischaemic Stroke/TIA patient are those who have established atherosclerotic cardiovascular disease (ACVD). This includes those with carotid artery stenosis, established atherosclerotic coronary artery disease such as a previous myocardial infarction, peripheral vascular disease or multiple atherosclerotic cardiovascular events.

5. An LDL-C target of 1.8mmol/L is recommended in international and national guidelines including the National Clinical Guidelines for Stroke in the UK and Norther Ireland[4].

6. In addition, NICE guideline 238 "Cardiovascular disease: risk assessment and reduction, including lipid modification" also recommend considering ezetimibe in addition to highest tolerated statin dose to further reduce the risk of vascular events even if the lipid target for secondary prevention is met. This has been found to be cost-effective[5].

4. Current situation and reason for guideline

1. Following the publication of the TST trial a pharmacist-led lipid clinic was set up for high risk ischaemic stroke/TIA patients with the aim of optimising lipid treatment to reach a target LDL-C of 1.8mmol/L or less. This lipid clinic is fully functioning and has a dedicated pharmacist assigned to it. It is also currently accepting referrals.

2. The setting up of this clinic has been discussed with all the stroke consultants, stroke nurses and stroke pharmacists since it's initiation through our monthly stroke education and business meeting. All stroke consultants are currently aware of the pathway and are also currently referring patients into the clinic. This includes all stroke consultants within NHS Lanarkshire - University Hospital Monklands, University Hospital Wishaw and University Hospital Hairmyres.

3. Consultant from all the three sites are currently copying in the stroke nurses and the stroke lipid clinic pharmacist into their final discharge letter to refer patients into this clinic. This ensure consistency across the three sites.

4. Two rounds of data collection have shown that a substantial portion of high risk ischaemic stroke/TIA patients are not being referred to the clinic by the responsible clinician.

5. This pathway has been developed to formalise the referral process with the aim of increasing the referral of patients who stand to benefit from lipid intensification treatment.

5. Target population and avoiding over-treatment

1. The SPARCL trial, mentioned above, excluded patients with atrial fibrillation where the aetiology of the stroke is cardio-embolic. Similarly, in the TST trial, cerebral infarction/TIA secondary to dissection or a cardiac source of embolism were key exclusion criteria. In this trial, people who had co-existing atrial fibrillation were only included if they met the inclusion criteria evidencing atherosclerosis.

2. A meta-analysis of randomised control trials showed that more intensive LDL-C lowering using statins was beneficial in trials where all patients had evidence of atherosclerosis as opposed to those trials were most patients did not have evidence of this[6].

3. In a recent systematic analysis around 3 in every 10 patients with acute ischaemic stroke and TIA did not have an indication for statin therapy. Although statins are considered to have a favourable safety profile they have been associated with an increased incidence of diabetes, renal and liver injury, cataracts and muscle-related toxicity[7].

4. While there is a net benefit from statin treatment, results from 8 trials that compared more intensive versus less intensive LDL-C lowering treatment regimens using statin therapy showed that there was an increased risk of haemorrhagic stroke in the more intensive group with a number needed to harm of 242[8].

5. The strict referral criteria (see pathway section page 6) for this clinic help target a specific group of ischaemic stroke or TIA patients where the aetiology is atherosclerotic in nature while also limiting over prescription of lipid lowering therapy in other subgroups of patients with ischaemic stroke.

6. Lipid Clinic Pathway

1. The pathway for referring into this clinic is as depicted in the flowchart on page 1 of this document.

2. Referrals into the clinic can only be through the stroke physician responsible for the overall care of the patient. Community stroke nurses and stroke ward pharmacists can help identify high-risk patients in accordance with the criteria detailed below and refer into the clinic following discussion and through the responsible stroke physician.

3. Referrals into this clinic are for patients who have come into contact with the stroke services either by being admitted to a stroke ward or having been reviewed by a stroke physician if on another medical ward or have been reviewed in a TIA clinic.

4. The criteria for referring into this clinic are

    a. Ischaemic stroke or TIA patient who are non-frail and non-dependent with and LDL-C of >1.8mmol/L any of the following:
        i. Stenotic plaque on carotid Doppler ultrasound
        ii. Previous history of myocardial infarction
        iii. Previous history of peripheral arterial atherosclerotic disease
        iv. Recurrent ischaemic events felt to be secondary to atherosclerotic vascular disease

5. Lipid treatment optimisation using high intensity statins (and/or ezetimibe) happens at first encounter. Ezetimibe with Bempedoic acid will be used within the Scottish Medicine Consortium Restrictions in patients who are statin intolerant or for whom statin is contra-indicated, where ezetimibe alone does not appropriately control LDL-C and/or where proprotein convertase subtilisin/kexin type 9 inhibitors (PCSK9i) are not appropriate.

6. High intensity statin refers to statins at doses that are anticipated to lower the LDL-C by more than 40%. This would be Atorvastatin at a dose of 20mg or higher or Rosuvastatin at a dose of 10mg or higher

7. In patients with “triglycerides too high” to measure LDL-C on a baseline lipid profile test, lifestyle advice is offered with a plan to check a fasting lipid profile after 2 weeks. The rest of the pathway should be followed.

8. The responsible clinician highlights these patients through a clinic or final discharge letter to the stroke nurses at the stroke hub.

9. Stroke nurses at the hub will follow up a lipid profile in 6-8 weeks’ after discharge.

10. If at that point the LDL-C is >1.8mmol/l, the patient will be highlighted to the pharmacist responsible for the clinic to arrange an appointment.

11. Lifestyle, compliance and any medication issues will be explored at that point with the aim to intensify treatment if possible.

12. Patients whose LDL-C remains above 3.5mmol/L will be highlighted to the responsible clinician by the lipid clinic pharmacist for consideration of PCSK9i through the NHS Lanarkshire Lipid Clinic.

13. Patient will continue to be followed up until

    a. their LDL-C is <1.8mmol/L,
    b. their LDL-C is 1.8mmol/L – 3.5mmol/L and on optimised lifestyle advice and lipid lowering therapy or
    c. LDL remains persistently >3.5mmol/L and they have been referred onward for PCSK9i.

References

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Appendices

1. **Governance information for Guidance document**

Lead Author(s):	Clayton Micallef
Endorsing Body:	ADTC
Version Number:	3
Approval date	November 2025
Review Date:	November 2028
Responsible Person (if different from lead author)	

CONSULTATION AND DISTRIBUTION RECORD	
Contributing Author / Authors	Mark Barber, Michael Hillhouse
Consultation Process / Stakeholders:	This document has been sent for comments and input to stroke physicians across NHS Lanarkshire (Dr Caroline McInnes, Dr Fiona Brodie, Dr Luke Yates, Dr Phil Birschel, Dr Peter Higgins, Dr Mohannad Ibraheem) as well as Stroke MCN team (Ms Katrina Brennan and Mr Mary Brannigan). It has also been sent via email to members who run the NHS Lipid Clinic – Dr David MacDougall (consultant cardiologist), Ms Laura McCafferty (lipid clinic pharmacist in University Hospital Hairmyres) via email on 10/6/2025. Mr Gary Lynas (Stroke Pharmacist) in University Hospital Wishaw was also included in email correspondence. Advice was also sought from the SMC through Ms Rachael Kelly
Distribution	In addition to above – the pathway has also been sent via email to Dr Lewis Vickers (consultant cardiologist) on 18th November 2025 as well as Dr Maheshi Gunasekara (consultant cardiologist) email on 19th November 2025.

CHANGE RECORD			
Date	**Lead Author**	**Change**	**Version No.**
16/09/2025	Clayton Micallef	1. *Clarified referral entry point in "Who is the guideline intended for section" and Pathway* 2. *Flow chart – increased font and change in background color to make it* easier to read 3. *Clarification that lipid clinic is currently running and accepting referrals in "current situation and reason for guidelines"* 4. *Clarified use of IPTR and SMC restriction for Ezetimibe/Bempedoic Acid by addition a separate section for this.* 5. *Clarified what happens when LDL >1.8 but <.5 and not multiple events or polyvascular in pathway.* 6. *Corrected grammatical error on page 6 point 3*	1
29/10/2025	Clayton Micallef	1. *Section 7 potentially sensitive SMC information as deemed by the ADTC has been removed* 2. *Clarification regarding consultantion process has been added. See points 2 and 3 of Section 4. Please also see already included in previous versions consultation process/stakeholders section on page 10.* 3. *Objection regarding GPs for repeat bloods – this has been removed from pathway and will continue to be done as currently is through the clinical support work at the stroke MCN hub.*	
20/11/2025	Clayton Micallef	1. *A request for clarity regarding pharmacist input from sites other than UHM previously emailed to be added to document. – This has been added to the Stakeholder process on page 9.*	
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