Information for Clinicians

Assessment and Management of Lipids

Lipid requests

In most people Cholesterol, HDL and Non-HDL measurement is used for screening and monitoring. Non-HDL cholesterol is used as an estimation of the total number of atherogenic lipoprotein particles; it is used to risk stratify patients and as a treatment target.

- Primary prevention target aims for a 40% reduction in Non-HDL.
- Secondary prevention targets aim for Non-HDL less than 2.5mmol/L

When are full lipid profiles required?

NICE CG181 states that a full lipid profile should be requested at least once before starting therapy. This should include Cholesterol, HDL, Non-HDL, LDL-c and Triglycerides. It does not need to be fasted.

Ensure a full lipid profile is requested:

- At least once before starting treatment
- In known hypertriglyceridaemia
- With mixed hyperlipidaemia of genetic aetiology
- When low HDL noted
- With risk factors for high triglycerides such as poorly controlled diabetes, alcohol excess or medications
- Monitoring cardiovascular disease

Lipid Management

All clinicians for primary and secondary prevention should now be using the NHSE National Lipid Pathway to guide treatment. This can be found at: NHS Accelerated Access Collaborative » Summary of national guidance for lipid management
A screenshot of the main guidance is attached below

Summary of lipid management for Primary and Secondary Prevention

- All patients with raised cholesterol should be encouraged to eat a diet high in fruit, vegetables & wholegrains and low in saturated fat however it is the overall calorie intake which can lead to excess weight that is most important
- A Mediterranean diet is the most healthy option
- Those with diabetes should optimise their control and overall calorie consumption.

- Encourage physical activity: 150 mins moderate aerobic activity a week.
- See https://www.nhs.uk/live-well/

In primary prevention:

- Lifestyle optimisation should be supported for 3-6 months with further evaluation at this point.
- QRISK can be used to help decide if treatment is required (when >10% risk) however it would not be appropriate for non-HDL to be untreated long term if greater than 5.0mmol/L
- After deciding to start treatment, only high intensity statins should be used (Rosuvastatin/Atorvastatin)
- The statin dose should be optimised with lipid checks every 3 months until at target, then monitor yearly
- The target should be a non-HDL reduction of 40%
- Second line treatment is Ezetimibe and it should be noted that adding to statin therapy reduces LDL more than doubling the dose of statin

In secondary prevention:

- Prescribe Atorvastatin 80mg or Rosuvastatin 40mg
- Target non-HDL is <2.5mmol/L (or less than 1.8mmol/L) unless multiple risk factors or progressive disease where LDL less than 1.4mmol/L is more suitable
- Review every 3 months until target achieved then monitor yearly
- Second line agents are Inclisiran (if LDL >2.6mmol/L) or Ezetimibe (if LDL 1.8-2.6mmol/L)

Statin Intolerance

- Most patients tolerate these newer statins (90%)
- However if the above medications cannot be used Bempedoic acid, with or without Ezetimibe, is available for use in both primary and secondary prevention.
- The NHSE statin intolerant pathway is below:

https://www.england.nhs.uk/aac/wp-content/uploads/sites/50/2020/04/statin-intolerance-pathway-v2.pdf

Further helpful charts can be found via these links:
https://thehealthinnovationnetwork.co.uk/wp-content/uploads/2024/06/Pathway-for-secondary-care-following-an-Acute-Cardiovascular-event.pdf

https://thehealthinnovationnetwork.co.uk/wp-content/uploads/2024/06/Lipid-optimisation-pathway-for-secondary-prevention-in-primary-care-and-the-community.pdf

Liver Function

- Do not exclude statin treatment for people whose baseline ALT or AST levels are raised but are <3 x the upper limit of normal (ULN)
- Monitor liver function at 3 and 12 months after starting statin only
- Stop statin if ALT >3 x ULN

Creatine Kinase

- Only measure a baseline CK if the patient has myalgia. If CK levels are more than 5 x upper limit of normal do not start statin treatment, investigate and refer as necessary
- Do not routinely measure CK in treated asymptomatic patients. If it is necessary to measure CK and levels are raised but <5 x the upper limit of normal, either stop or reduce to a lower dose of statin once symptoms have resolved
- If CK levels are >5 x upper limit of normal, then stop statin immediately and refer to BNF

Familial Hypercholesterolaemia

- Familial Hypercholesterolaemia (FH) is common, with an estimated prevalence of 1 in 250

- This condition should be considered and patients referred if they have:
  - Total cholesterol (TC) >7.5mmol/L or LDL-cholesterol >4.9mmol/L **AND**
  - A family history of premature coronary heart disease in a 1st degree relative (defined as <60 years old) or a 2nd degree relative (defined as <50 years old)

- We would also recommend referral in patients with a TC >9.0mmol/L or a non-HDL cholesterol >7.5mmol/L even in the absence of a family history of premature coronary heart disease.

- The lipid clinic will decide on the likelihood of FH and if suspected arrange appropriate genetic testing to confirm/exclude this diagnosis. If confirmed appropriate family cascade testing can be initiated by the clinic.

- In patients in whom Familial Hypercholesterolaemia (FH) is suspected do **NOT** use QRISK to decide on treatment, this will underestimate the true level of risk. It is in most instances reasonable to wait for patient to be seen in clinic before starting treatment.

- If a patient is started on treatment prior to being seen in clinic, please ensure that at least one full lipid profile has been requested beforehand.

- In general, the target for treatment is to lower the LDL by at least 50%

Mixed dyslipidaemias (raised cholesterol and raised triglycerides)

- Mixed dyslipidaemias are common. These patients have a total cholesterol >5.0mmol/L and raised triglycerides. This type of dyslipidaemia, is often observed in patients who are obese/overweight, are insulin resistant/have glucose intolerance or who consume alcohol in excess. In many instances this type of dyslipidaemia is very amenable to lifestyle intervention.

- However, advice should be sought if a patient with a mixed dyslipidaemia has a personal or family history of premature cardiovascular disease. These patients may have Familial Combined Hyperlipidaemia (FCH), which is an autosomal dominant inherited condition associated with an increased risk of cardiovascular disease.

- QRISK should also **NOT** be used to assess CV risk in a patient with suspected FCH

Hypertriglyceridaemia

- If triglycerides are >20 mmol/L consider urgent discussion with a lipid consultant. These patients may require immediate initiation of a Fibrate and urgent referral to secondary care. There is a significant risk of pancreatitis.

- If the triglyceride concentration is between 10-20mmol/L treat the cause and repeat a full lipid profile (after an interval of 5 days but within 2 weeks). Please refer to the lipid clinic if triglycerides are >10 mmol/L on more than one occasion.
- In all cases of hypertriglyceridaemia consider alcohol, obesity, diabetes, diet and medication as common possible causes.

Referral to Lipid Clinic

- Common secondary causes of dyslipidaemia should be excluded before referral. They include:
    - Raised BMI
    - Impaired glucose tolerance or diabetes
    - Excess alcohol
    - Hypothyroidism
    - Liver disease
    - Nephrotic syndrome
    - Medications

- In general, the lipid clinic manages genetic causes of lipid abnormalities and primary or secondary prevention is managed in the community. A referral should only be made if considering a genetic condition or there is a specific issue that requires specialist input (see below). A referral is only indicated if a patient's dyslipidaemia persists after treatment of secondary causes and 3 months targeted management of adverse lifestyle/metabolic features.
- On the referral we would ask that the following tests have been ordered: HbA1c, TFT, U&E, LFT, and urine albumin creatinine ratio.
- The referral should include recent lipid profile, a full list of current medications, BMI, cardiovascular risk factors and family history.
- Any letter for advice or referral should be sent through the choose and book service eRS system

Please refer the following groups of patients:

- Suspected Familial Hypercholesterolemia (FH)
- Severe hypertriglyceridemia (1x triglycerides >20 mmol/L, 2x >10 mmol/L if no other cause evident)
- Some groups of patients with lower levels triglycerides than above benefit from being seen if they require behaviour modification.
- Intolerance to medications; please see statin intolerant pathway below
- Severe hypercholesterolemia (TC >9 or non-HDL-C >7.5 mmol/L)
- Patients who may be suitable for injectable Alirocumab or Evolocumab therapies in accordance with NICE Guidance (TAs 393 and 394)
    - FH without CVD but LDL-C persistently above 5 mmol/L
    - FH with CVD and LDL-C persistently above 3.5 mmol/L
    - Non-FH but *high or **very high risk of CVD with LDL-C persistently above 4 or 3.5 mmol/L respectively
      (*High risk of CVD = disease in one vascular territory)
      (**Very high risk of CVD = disease in two vascular territories or progressive disease despite lipid lowering treatment)

The lipid clinic does not administer Inclisiran as this is positioned in primary care in the National lipid pathway.

Pregnancy

Lipid-lowering medication is not recommended for 3 months prior to conception, during pregnancy, nor during breastfeeding.

Summary of National Guidance for Lipid Management for Primary and Secondary Prevention of CVD

ACCELERATED ACCESS COLLABORATIVE

INITIAL CONSIDERATIONS:
• Measure non-fasting ***full lipid profile*** (total cholesterol, HDL-C, non-HDL-C, triglycerides) and HbA1c as part of an initial baseline assessment. • Consider secondary causes of hyperlipidaemia and manage as needed.
• Ensure appropriate baseline and follow up tests as detailed on page 2. Measure BMI. • Identify and exclude people with contraindications/drug interactions • If non-fasting triglyceride above 4.5mmol/L see page 2.

PRIMARY PREVENTION

Offer lifestyle changes and consider statin therapy for adults who do not have established CVD but fall into the categories below. Use QRISK risk assessment tool where appropriate (see page 2, *'Primary Prevention Risk Assessment'*)

- Age ≤84 & QRISK ≥10% over next 10 years
- Type 2 diabetes & QRISK ≥10% over next 10 years
- Type 1 diabetes, if they have one or more of the following:
  - Over 40 years
  - Had diabetes for >10 years
  - Have established nephropathy
  - Have other CVD risk factors
- CKD eGFR < 60 mL/ min/1.73m² and/or albuminuria
- Age ≥85 years if appropriate consider co-morbidities, frailty & life expectancy

Discuss the benefits of lifestyle changes and identify and address all modifiable risk factors - smoking, diet, obesity, alcohol intake, physical activity, blood pressure and HbA1c.
Offer people the opportunity to have their risk of CVD assessed again after they have tried to change their lifestyle (where applicable)

Consider additional risk factors, if present, together with QRISK score (treated for HIV, severe mental illness, taking medicines that cause dyslipidaemia, systemic inflammatory disorder (e.g. SLE), impaired fasting glycaemia, recent change in risk factors)

PRIMARY PREVENTION

If lifestyle modification is ineffective or inappropriate, discuss the risks and benefits of statins, and offer treatment based on an informed shared-decision.
Atorvastatin 20mg daily

- Measure full lipid profile again after 2-3 months (non-fasting).
- High intensity statin treatment should achieve reduction of non-HDL-C > 40% from baseline. If not achieved after 2-3 months;
  - Discuss treatment adherence, timing of dose, diet and lifestyle
  - If at higher risk (based on comorbidities, risk score or clinical judgement – see page 2 *'Additional Risk Factors'*) consider increasing the dose every 2-3 months up to a maximum dose of atorvastatin 80mg daily.
  - For how to increase in people with CKD see *'Special Patient Populations'* (page 2).
- If patients on a high-intensity statin have side effects, offer a lower dose or an alternative statin (see page 2 *'Extent of lipid lowering with available therapies'*)
- If maximum tolerated dose of statin does not achieve non-HDL-C reduction > 40% of baseline value after 2-3 months consider adding Ezetimibe 10mg daily (NICE TA385)
- If statin treatment is contraindicated or not tolerated;
  - See AAC Statin Intolerance Algorithm for advice regarding adverse effects (click here)
  - Ezetimibe 10mg monotherapy may be considered. Assess response after 2-3 months.
  - Ezetimibe 10mg/bempedoic acid 180 mg combination may be considered when ezetimibe alone does not control non-HDL-C/LDL-C well enough (NICE TA694).

If non-HDL-C reduction remains < 40% of baseline despite maximal tolerated lipid lowering therapy (including people with intolerances and contraindications) consider referral to specialist lipid management clinic according to local arrangements

SEVERE HYPERLIPIDAEMIA

If TC>7.5mmol/L and/or LDL-C >4.9mmol/L and/or non-HDL-C >5.9mmol/L, a personal and/or family history of confirmed CHD (<60 years) and with no secondary causes: suspect familial hypercholesterolaemia (possible heterozygous FH)
Do not use QRISK risk assessment tool

DIAGNOSIS AND REFERRAL

Take fasting blood for repeat lipid profile to measure LDL-C.
Use the **Simon Broome** or **Dutch Lipid Clinic Network** (DLCN) criteria to make a **clinical diagnosis of FH**.
Use clinical findings, a full lipid profile and family history to judge the likelihood of a familial lipid disorder, rather than using strict lipid cut-off values alone.
Refer to Lipid Clinic for further assessment if **clinical diagnosis of FH**
or if TC>9.0mmol/L and/or LDL-C >6.5mmol/L and/or non-HDL-C >7.5mmol/L or Fasting triglycerides > 10mmol/L (regardless of family history) (page 2)

TREATMENT TARGETS IN FH

If clinical diagnosis of FH and/or other risk factors present follow the recommended treatment management pathway for primary or secondary prevention as for non-FH, ***BUT***
Aim to achieve at least a 50% reduction of LDL-C (or non-fasting non-HDL-C) from baseline.
Consider specialist referral for further treatment and/or consideration of PCSK9i therapy IF
- they are assessed to be at very high risk of a coronary event**
- OR therapy is not tolerated
- OR LDL-C remains >5mmol/L (primary prevention)
- OR LDL-C remains >3.5mmol/L (secondary prevention)

despite maximal tolerated statin and ezetimibe therapy.

**defined as any of the following:
• Established coronary heart disease
• Two or more other CVD risk factors

SECONDARY PREVENTION

Offer statin therapy to adults with CVD, this includes CHD, angina, Acute Coronary Syndrome (MI or unstable angina), revascularisation, stroke or TIA, or symptomatic peripheral arterial disease. Do not delay statin treatment if a person has acute coronary syndrome. Take a lipid sample on admission (within 24 hours).

Identify and address all modifiable risk factors - smoking, diet, obesity, alcohol intake, physical activity, blood pressure and HbA1c.

SECONDARY PREVENTION

Do not delay statin treatment in secondary prevention while managing modifiable risk factors. Prescribe a high intensity statin:
Atorvastatin 80mg daily
Use a lower dose of atorvastatin if there is a potential drug interaction, high risk of or experiencing adverse effects, or patient preference.
Offer atorvastatin 20mg if CKD (people with GFR< 60 mL/min/1.73m²).

- Measure full lipid profile again after 2-3 months (non-fasting).
- Aim for an LDL-C of ≤ 2.0 mmol/L, or non-HDL-C of ≤ 2.6 mmol/L
- LDL and non-HDL-C levels should be reduced as much as possible. Personalise targets based on clinical judgement and an informed discussion with patient. ***See Titration Thresholds / Targets* (page 2)**
- If high intensity statin treatment does not achieve expected reduction (see table on page 2) after 2 to 3 months
  - Discuss treatment adherence, timing of dose, diet and lifestyle measures
  - If started on less than atorvastatin 80mg and the person is judged to be at higher risk (based on co-morbidities or clinical judgment), consider increasing to 80mg atorvastatin or maximally tolerated dose. For how to increase in people with CKD see *'Special Patient Populations'* (page 2).
- If patients on a high-intensity statin have side effects, offer a lower dose or an alternative statin (see page 2 *'Extent of lipid lowering with available therapies'*)

Escalating lipid lowering treatment
If maximum tolerated dose of statin does not control non-HDL-C/LDL-C well enough after 2-3 months confirm statin adherence, then consider the following escalation of treatment options based on shared decision making with the patient.
- Ensure an informed discussion between the clinician and the person about the risks and benefits of additional lipid-lowering treatments.
- Take into account the person's preferences, the presence of any comorbidities, whether they are on multiple medications, whether they have frailty and their life expectancy.
- Do not routinely de-escalate lipid lowering therapies when levels are lower than NICE target, except if clinically indicated or based on the person's needs or preferences

If recommended statin treatment is contraindicated or not tolerated - follow AAC Statin Intolerance Algorithm for advice regarding adverse effects (click here).

If statin intolerance is confirmed, consider:
- **Ezetimibe 10mg** monotherapy. Assess response after 3 months (TA385)
- **Ezetimibe 10mg/bempedoic acid 180 mg** combination when ezetimibe alone does not control non-HDL-C sufficiently. (NICE TA694)

If non HDL-C remains > 2.6mmol/L despite other lipid lowering therapies consider Injectable therapies - arrange a fasting blood test and assess eligibility criteria (TA393/394, TA733)

Ezetimibe 10mg daily (NICE TA385). Reassess after three months. If non-HDL-C remains > 2.6mmol/L; consider **injectable therapies** arrange a fasting blood test and assess eligibility

** Inclisiran and PCSK9i should not be prescribed concurrently

Injectable therapies**
If non-HDL-C > 2.6mmol/L; Arrange fasting blood test to measure LDL-C to assess eligibility:
- **Inclisiran** - if fasting LDL-C ≥ 2.6mmol/L despite maximum tolerated lipid lowering therapy (TA733)

OR

- **PCSK9i** - see overleaf for LDL-C thresholds. (TA393/4)

If eligibility criteria not met, consider **ezetimibe 10mg daily** (if not previously considered)

Additional CV risk reduction considerations - check fasting triglycerides levels and consider icosapent ethyl. See triglycerides section overleaf.

Consider ezetimibe in addition to the maximum tolerated intensity and dose of statin to reduce CVD risk further, even if the lipid target for secondary prevention of CVD is met. (NG238)

MANAGEMENT

This guidance applies to new patients and may also be taken into consideration for those already on statins at their annual review. If 40% reduction of non-HDL-C, or target levels are not achieved, offer high intensity statins. Discuss with people who are stable on a low- or medium-intensity statin the likely benefits and potential risk of side effects if changed to a high-intensity statin when they have a medication review and agree with the person whether a change is needed.

Ezetimibe, alirocumab, evolocumab or inclisiran can be added when patients' LDL-C levels are not lowered enough with the maximally tolerated dose of statins. If statins are contraindicated or not tolerated and ezetimibe alone does not control LDL-C well enough, bempedoic acid with ezetimibe is an option. Do not offer a fibrate, nicotinic acid, bile acid binder or omega-3 fatty acids alone or in combination with statin, for the prevention of CVD (check NICE NG238 and TA805 for exceptions).

PRIMARY PREVENTION RISK ASSESSMENT

Use QRISK3 version of the calculator (or QRISK2 if not available).

- Do not use this risk assessment tool for people with established CVD or those who are already at high risk of developing CVD because of FH or other inherited disorders of lipid metabolism.
- Do not use a risk assessment tool to assess CVD risk in people with type 1 diabetes, or eGFR < 60 mL/min/1.73 m² and/or albuminuria (as already at high risk of developing CVD).
- Consider people aged ≥ 85 at increased risk of CVD because of age alone particularly people who smoke or have raised BP.
- If QRISK <10% over next 10 years, do not rule out treatment if there is an informed preference for taking a statin or a concern that risk may be underestimated.
- Consider a lifetime risk tool (e.g. QRISK3-lifetime) to inform discussions on CVD risk and to motivate lifestyle changes, particularly for people with a 10-year score < 10%, and people < 40 who have CVD risk factors.

Additional Risk Factors

Note, standard CVD risk scores including QRISK may underestimate risk in people who have additional risk because of underlying medical conditions or treatments. These include, but not limited to the following group of people;

- obesity increases CVD risk (NICE CG189)
- treated for HIV
- severe mental illness
- taking medicines that can cause dyslipidaemia such as antipsychotic medication, corticosteroids or immunosuppressant drugs
- already taking medicines to treat CVD risk factors
- autoimmune disorders such as SLE, and other systemic inflammatory disorders
- non-diabetic hyperglycaemia
- significant hypertriglyceridaemia (fasting triglycerides 4.5-9.9mmol/L)
- recent risk factor changes e.g. quit smoking, BP or lipid treatment

Consider socio-economic status as an additional factor contributing to CVD risk (if not already in the risk calculator).

SPECIAL PATIENT POPULATIONS

Type 1 Diabetes

While NICE recommends offering statins to patients with Type 1 diabetes as detailed in the algorithm, it also states to consider statins in those aged 18 to 40 with type 1 diabetes, including those who have had diabetes for ≤ 10 years

Chronic Kidney Disease

Offer atorvastatin 20mg for the primary or secondary prevention of CVD to people with CKD (eGFR less than 60 mL/min/1.73m² and/or albuminuria)

Increase the dose if target is not achieved and eGFR is 30 mL/min/1.73m² or more.

Agree the use of higher doses with a renal specialist if eGFR is less than 30 mL/min/1.73m²

Statins in Pregnancy and Lactation

Statins should be stopped 3 months before attempting to conceive and not be restarted until breastfeeding is finished. Stop statins if pregnancy is a possibility.

ABBREVIATIONS

ALT: alanine aminotransferase
AST: aspartate aminotransferase
CHD: coronary heart disease
CKD: chronic kidney disease
CVD: cardiovascular disease
FH: familial hypercholesterolaemia
JBS: Joint British Societies
LDL-C: low density lipoprotein cholesterol
non-HDL-C: non-high density lipoprotein cholesterol
PCSK9i: proprotein convertase subtilisin kexin 9 monoclonal antibody inhibitor
QOF: Quality and Outcomes Framework
SLE: systemic lupus erythematosus
SPC: summary of product characteristics
TC: total cholesterol

EXTENT OF LIPID LOWERING WITH AVAILABLE THERAPIES

Approximate reduction in LDL-C					
Statin dose mg/day	5	10	20	40	80
Fluvastatin			21%	27%	33%
Pravastatin		20%	24%	29%	
Simvastatin		27%	32%	37%	42%
Atorvastatin		37%	43%	49%	55%
Rosuvastatin	38%	43%	48%	53%	
Atorvastatin + Ezetimibe 10mg		52%	54%	57%	61%

Low intensity statins will produce an LDL-C reduction of 20-30%
Medium intensity statins will produce an LDL-C reduction of 31-40%
High intensity statins will produce an LDL-C reduction above 40%
Simvastatin 80mg is not recommended due to risk of muscle toxicity

- **Rosuvastatin** may be used as an alternative to atorvastatin if compatible with other drug therapy. Some people may need a lower starting dose (see BNF).
- Low/medium intensity statins should only be used if intolerance or drug interactions.
- **Ezetimibe** when combined with any statin is likely to give greater reduction in non-HDL-C or LDL-C than doubling the dose of the statin.
- **PCSK9i** (NICE TA393, TA394) alone or in combination with statins or ezetimibe produce an additional LDL-C reduction of approximately 50% (range 25-70%).
- **Bempedoic acid** when combined with ezetimibe (TA694) produces an additional LDL-C reduction of approximately 28% (range 22-33%).
- **Inclisiran** (TA733) alone or in combination with statins or ezetimibe produces an additional LDL-C reduction of approximately 50% (range 48-52%) but no clinical outcome evidence is currently available.

MONITORING

Baseline Measurements

In addition to full lipid profile, measure renal, thyroid and liver profiles (including albumin) and HbA1c to exclude secondary causes and co-morbidities.
Measure baseline liver transaminase (ALT or AST) before starting a statin.
Measure CK if unexplained muscle pain before starting a statin.
CK should not be measured routinely especially if a patient is asymptomatic.

	Primary Prevention		Secondary prevention	
	Lipid Profile	ALT or AST	Lipid Profile	ALT or AST
Baseline	✔	✔	✔	✔
2-3 months	✔	✔	✔	✔
6-9months	If targets are not met, and up-titration is agreed, repeat full lipid profile and ALT or AST within 2-3 months of each up-titration of statin dose or addition of ezetimibe as required			
12 months	✔	✔	✔	✔
Yearly	✔*		✔*	

Provide annual medication reviews for people taking statins to discuss effectiveness of therapy, medicines adherence, lifestyle modification and address CVD risk factors.
***Offer in secondary prevention, and consider in primary prevention an annual non-fasting full lipid profile** to inform the discussion around effectiveness of lipid lowering therapy and any medicines non-adherence.*

Monitoring

Repeat full lipid profile is non-fasting.
Do not stop statins because of an increase in blood glucose level or HbA1c
Advise that the risk of muscle pain, tenderness or weakness associated with statins is small and the rate of severe muscle adverse effects (rhabdomyolysis) is extremely low.

Liver Transaminases

Measure liver transaminase within 3 months of starting treatment and then within 2-3 months of every additional up titration and then again at 12 months, but not again unless clinically indicated.

If ALT or AST are greater than 3 times the upper limit of normal then do not initiate a statin or discontinue statin therapy already prescribed and repeat the LFTs in a month.

If ALT or AST are elevated but are less than 3 times the upper limit of normal then:
- Do not routinely exclude from statin treatment
- Continue the statin and repeat in a month.
- If they remain elevated but are less than 3 times the upper limit of normal then continue statin and repeat again in 6 months.

References

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TITRATION THRESHOLD / TARGETS

	NICE titration threshold / QOF	JBS3**
Primary prevention	Escalate lipid lowering therapy if non-HDL-C reduction from baseline ≤ 40%	non-HDL-C <2.5mmol/L (LDL-C <1.8mmol/L)
Secondary Prevention	Aim for an LDL-C of ≤ 2.0 mmol/L, or non-HDL-C of ≤ 2.6 mmol/L at least*	
FH	Optimise lipid lowering therapy to achieve at least 50% reduction in LDL-C (or non-HDL-C.)	

*Consider ezetimibe to reduce CVD risk further, even if the NICE lipid target for secondary prevention of CVD is met.
**LDL-C and non-HDL-C levels should be reduced as much as possible in people with CVD. Consider a personalised target, as clinically indicated, e.g. JBS3 consensus recommendation

Non-HDL-C = TC minus HDL-C **LDL-C** = non-HDL-C minus (Fasting triglycerides[a]/2.2)
[a] valid only when fasting triglycerides are less than 4.5 mmol/L

SPECIALIST SERVICES

Scope of specialist service available locally may include; lipid clinic, PCSK9i clinic (offering initiation and subsequent follow up), FH genetic diagnosis and cascade testing, lipoprotein apheresis service. NICE eligibility criteria for PCSK9i and fasting LDL-C thresholds are summarised below.

NICE TA393 Alirocumab NICE TA394 Evolocumab	Without CVD	With CVD	
		High risk [1]	Very high risk [2]
Primary non-FH or mixed dyslipidaemia	Not recommended	LDL C > 4.0 mmoL/L	LDL C > 3.5 mmoL/L
Primary heterozygous-FH	LDL C > 5.0 mmoL/L	LDL C > 3.5 mmoL/L	

[1] History of any of the following: ACS; coronary or other arterial revascularisation procedures; CHD, ischaemic stroke; PAD. [2] Recurrent CV events or CV events in more than 1 vascular bed (that is, polyvascular disease).

Bempedoic acid/ezetimibe and inclisiran are available in primary care and do not require initiation by specialist services.' PCSK9i may be available for prescribing in primary care: see local initiation pathways.

TRIGLYCERIDES

Triglyceride concentration	Action
Greater than 20mmol/L	**Refer to lipid clinic for urgent specialist review** if not a result of excess alcohol or poor glycaemic control. At risk of acute pancreatitis.
10 - 20mmol/L	Repeat the TG measurement with a fasting test (after an interval of 5 days, but within 2 weeks) and review for potential secondary causes of hyperlipidaemia. Seek specialist advice if the TG concentration remains > 10mmol/litre. At risk of acute pancreatitis
4.5 - 9.9mmol/L	If non-fasting triglycerides are greater than 4.5mmol/L, repeat with a fasting TG measurement. Be aware that the CVD risk may be underestimated by risk assessment tools, optimise the management of other CVD risk factors present and seek specialist advice if non-HDL-C concentration is > 7.5 mmol/litre.

Icosapent ethyl (TA805)
- Check fasting triglycerides levels.
- Manage secondary causes of hypertriglyceridaemia.
- Consider icosapent ethyl (TA805) if patient has established cardiovascular disease (secondary prevention) **and**
  - on statins and fasting TG ≥ 1.7mmol/L and LDL-C* between 1.04‡ and ≤2.6mmol/L
- See table above and refer as appropriate.

* LDL-C cannot be calculated using Friedewald's formula if TG >4.5. Discuss with your lab. Consider using an alternative equation (eg Sampson, doi: 10.1001/jamacardio.2020.0013) or beta-quantification.
‡ labs don't report calculated LDL-C beyond one decimal point

STATIN INTOLERANCE

Statin intolerance is defined as the presence of clinically significant adverse effects from statin therapy that are considered to represent an unacceptable risk to the patient or that may result in adherence to therapy being compromised.

For people who are intolerant of the recommended statin treatment see the NHSE AAC statin intolerance algorithm, available on the NHSE AAC page (Click here)

Authors: Dr Rani Khatib & Dr Dermot Neely on behalf of the AAC Clinical Subgroup.
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"This summary accurately reflects NICE guidance and JBS3 recommendations", NICE March 2024

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Amendment History

Issue	Status	Date	Reason for Change	Authorised
1.0	Published	April 2023	First Issue	AMS Lead
2.0	Published	February 2022	Updated Version	Clinical Director of Pathology
3.0	Published	May 2024	Update version	Clinical Director of Pathology
3.1	Published	Oct 24	Changes to add more reflections on new lipid pathways	Moya O'Doherty