UCLPartners

Lipid management
Case studies in primary and secondary prevention

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

ACCELERATED ACCESS COLLABORATIVE

NHS

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 hyperlipidemia 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

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 comorbidities, frailty & life expectancy

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

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

PRIMARY PREVENTION

If lifestyle modification is ineffective or inappropriate offer statin treatment.

Atorvastatin 20mg OD

- Measure full lipid profile again after 3 months (non-fasting).
- High intensity statin treatment should achieve reduction of non-HDL-C > 40% from baseline. If not achieved after 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 3 months consider adding Ezetimibe 10mg daily (NICE TA385)
- If recommended statin therapy is contraindicated or not tolerated;
- Ezetimibe monotherapy may be considered. Assess response after 3 months
- See local statin intolerance guidance / pathway where available
- 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 no secondary causes: suspect Familial Hypercholesterolemia (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.
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 angina, previous MI, 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. Prescibe a high intensity statin: Atorvastatin 80mg OD. 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 3 months (non-fasting).
- High intensity statin treatment should achieve reduction of non-HDL-C > 40% from baseline. If not achieved after 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 comorbidities, risk score or clinical judgement – see page 2 'Additional Risk Factors'), consider increasing to 80mg Atorvastatin. For how to increase in people with CKD see 'Special Patient Populations' (page 2).
- If non-HDL-C baseline value is not available*, consider target non-HDL-C < 2.5mmol/L (approximately equivalent to LDL-C < 1.8mmol/L) as recommended by Joint British Societies (JBS3).

*This scenario is not covered by NICE CG181

- 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 control non-HDL-C/LDL-C well enough after 3 months confirm statin adherence, then consider the following options based on shared decision making* with the patient

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 > 2.5mmol/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 > 2.5mmol/L; consider **injectable therapies** arrange a fasting blood test and assess eligibility

* See overleaf for information to support shared decision making
** Inclisiran and PCSK9i should not be prescribed concurrently

Injectable therapies**
If non-HDL-C > 2.5mmol/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 are not met, consider **ezetimibe 10mg daily** (if not previously considered)

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 not achieved, offer high intensity statins. Discuss with people who are stable on a low- or middle-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. Bempedoic acid with ezetimibe is an option when statins are contraindicated or not tolerated, and when ezetimibe alone does not control LDL-C well enough. 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 CG181 for exceptions).

PRIMARY PREVENTION RISK ASSESSMENT

QRISK3 is the current version of the QRISK calculator www.qrisk.org/three
- Do not use this risk assessment tool for people with established CVD or those who are 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 less than 60 mL/min/1.73 m2 and/or albuminuria.
- Consider people aged ≥ 85 at increased risk of CVD because of age alone particularly people who smoke or have raised BP.

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 groups include the following groups of people;
- severe obesity (BMI>40kg/m2) increases CVD risk
- treated for HIV,
- serious mental health problems,
- taking medicines that can cause dyslipidaemia such as antipsychotic medication, corticosteroids or immunosuppressant drugs
- autoimmune disorders such as systemic lupus erythematosus, 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 QRISK < 10% over the next 10 years - give lifestyle advice and ensure regular review of CVD risk in line with guidance.

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 all adults with Type 1 diabetes.

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 a greater than 40% reduction in non-HDL-C 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.

ABBREVIATIONS

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

Authors: Dr Rani Khatib & Dr Dermot Neely on behalf of the AAC Clinical Subgroup. Nov 2021.
Review date: Nov 2022. NICE endorsed Dec 2021.

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/moderate 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 for primary or secondary prevention if compatible with other drug therapy. Lower starting dose maybe needed in some. See BNF.
- **Other statins** should only be used in intolerance or drug interactions.
- **Ezetimibe** when combined with any statin is likely to give greater reduction in non-HDL-C/LDL-C than doubling the dose of the statin.
- **PCSK9i** (NICE TA393,394) 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%) but no clinical outcome evidence is currently available.
- **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	✓	✓	✓	✓
3 months	✓	✓	✓	✓
6-9 months	If <40% non-HDL-C reduction, up titration required. Repeat full lipid profile and ALT or AST within 3 months of each up-titration of statin dose or addition of Ezetimibe as required			
12 months	✓	✓	✓	✓
Yearly	✓ (where needed)		✓ (where needed)	

*Provide annual medication reviews for people taking statins to discuss effectiveness of therapy, medicines adherence, lifestyle modification and address CVD risk factors. *Consider 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.
Measure liver transaminase within 3 months of starting treatment and then within 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:
- 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.

TITRATION THRESHOLD/TARGETS

	NICE titration threshold	JBS3
Primary Prevention Secondary Prevention	Intensify lipid lowering therapy if: non-HDL-C reduction from baselineis less than 40%	non-HDL-C <2.5mmol/L (LDL-C <1.8mmol/L)
FH	Optimise lipid lowering therapy to achieve at least 50% reduction in LDL-C (or Non-HDL-cholesterol.)	

If baseline cholesterol is unknown in the setting of secondary prevention use the use Joint British Societies' 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.

	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.

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)

References:
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NICE. 2008. CG71 www.nice.org.uk/guidance/cg71
NICE 2021. TA694 www.nice.org.uk/guidance/TA694
NICE 2021. TA733 www.nice.org.uk/guidance/TA733

Approved by the National Institute for Health and Care Excellence (NICE), Dec 2021

Cholesterol – Secondary Prevention (pre-existing CVD)

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Healthcare assistants/other appropriately trained staff

Gather information e.g.	Up to date bloods, BP, weight, smoking status.
Self-management e.g.	Education (cholesterol, CVD risk), BP monitors (what to buy, how to use), signpost to shared decision making resources.
Behaviour change e.g.	Brief interventions and signposting e.g. smoking, weight, diet, exercise, alcohol.

Stratification

Priority One	Priority Two	Priority Three	Priority Four– routine follow up
Not on statin therapy	On suboptimal intensity statin*	On suboptimal statin dose**	Sub-optimal non-HDL (>2.5mmol/l) levels despite maximal statin therapy

Prescribing clinician

Optimise lipid modification therapy and CVD risk reduction

1. Review CVD risk factors, lipid results and liver function tests.
2. Initiate or optimise statin to high intensity – e.g. atorvastatin 80mg.
3. Titrate therapy against reduction in LDLc/non-HDLc (statin>ezetimibe>PCSK9i)mAB)/inclisiran).
4. Optimise BP and other comorbidities.
5. Use intolerance pathway and shared decision-making tools to support adherence.
6. Arrange follow-up bloods and review if needed.

* E.g simvastatin
** E.g atorvastatin 40mg

Cholesterol –Primary Prevention (no pre-existing CVD)

UCLPartners

Healthcare assistants/other appropriately trained staff

Gather information: E.g. up to date bloods, BP, weight, smoking status, run QRISK score.*

Self-management: Education (cholesterol, CVD risk), BP monitors (what to buy, how to use), signpost to shared decision making resources.

Behaviour change: Brief interventions and signposting e.g. smoking, weight, diet, exercise, alcohol.

Stratification

Priority One
One of:
- QRISK ≥20%
- CKD
- Type 1 Diabetes

AND
- Not on statin

Priority Two
- QRISK 15-19%

AND
- Not on statin

Priority Three
- QRISK 10-14%

AND
- Not on statin

Priority Four
On statin for primary prevention but not high intensity

Prescribing clinician

Optimise lipid modification therapy and CVD risk reduction

1. Review QRISK score, lipid results and LFTs.
2. Initiate or optimise statin to high intensity – eg atorvastatin 20mg.
3. Titrate therapy against reduction in LDLc/non-HDLc (statin>ezetimibe).
4. Optimise BP and other comorbidities.
5. Use intolerance pathway and shared decision-making tools to support adherence.
6. Arrange follow-up bloods and review if needed.

*QRISK 3 score is recommended to assess CV risk for patients with Severe Mental Illness, Rheumatoid Arthritis , Systemic Lupus Erythematosus, those taking antipsychotics or oral steroids

UCLPartners Proactive Care Frameworks

UCLPartners has developed a series of frameworks for local adaptation to support proactive management of long-term conditions in post-COVID primary care.

- Led by clinical team of GPs and pharmacists
- Supported by patient and public insight
- Working with local clinicians and training hubs to adapt and deliver

Core principles:

1. Virtual where appropriate and face to face when needed
2. Mobilising and supporting the wider workforce (e.g. pharmacists, HCAs, and others) to optimise clinical care and holistic care
3. Step change in support for self-management
4. Digital innovation including apps for self-management and technology for remote monitoring

Implementation Resources

1. Optimisation Pathway for Secondary Prevention
2. Optimisation Pathway for Primary Prevention
3. Statin Intolerance Pathway
4. Muscle Symptoms Pathway
5. Abnormal Liver Function Test Pathway
6. Shared Decision-Making Resources
7. Overview of Medicines Optimisation in FH
8. FH questionnaire

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Case Studies

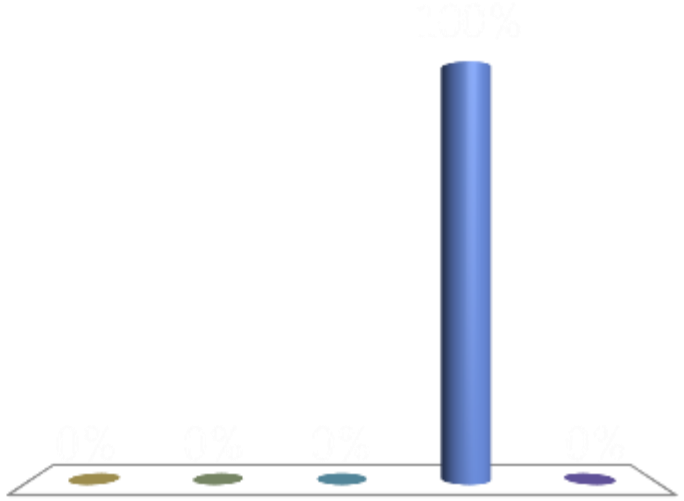
Subita

- Subita is a 71 year old Bangladeshi woman with type 2 diabetes
- Her HbA1c is being managed initially with metformin
- She is picked up by the UCLP primary prevention searches as a priority one patient as she is not currently on a statin
- Her cholesterol is
  - Total chol 5.4mmol/L
  - LDL chol 3.6mmol/L
  - HDL chol 0.8mmol/L

MENTIMETER:

In terms of her cholesterol Subita should be offered:

A. Risk assessment using QRisk
B. A statin
C. Lifestyle advice
D. A statin and lifestyle advice
E. Not sure



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Primary Prevention

- Offer atorvastatin 20 mg for the primary prevention of CVD to people with type 2 diabetes who have a 10% or greater 10-year risk of developing CVD

- Estimate the level of risk using the QRISK2 assessment tool.

Welcome to the QRISK®2-2014 risk calculator: http://qrisk.org

This calculator is only valid if you do not already have a diagnosis.

Reset | Information | Publications | About | Copyright | Contact Us | Algorithm | Software

About you

Age (25-84): 71
Sex: ○ Male ◉ Female
Ethnicity: Bangladeshi

UK postcode: leave blank if unknown
Postcode:

Clinical information

Smoking status: non-smoker
Diabetes status: type 2
Angina or heart attack in a 1st degree relative < 60? ☐
Chronic kidney disease? ☐
Atrial fibrillation? ☐
On blood pressure treatment? ☐
Rheumatoid arthritis? ☐

Leave blank if unknown
Cholesterol/HDL ratio: 6.75
Systolic blood pressure (mmHg): 160

Body mass index
Height (cm):
Weight (kg):

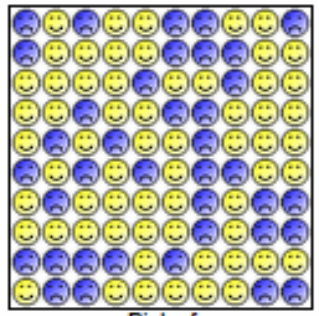
Calculate risk over 10 years. Calculate risk

Your results

Your risk of having a heart attack or stroke within the next 10 years is:

37.9%

In other words, in a crowd of 100 people with the same risk factors as you, 38 are likely to have a heart attack or stu



Risk of
heart attack or stroke

Your score has been calculated using estimated data, as some information was left blank.

Your body mass index was estimated as 29.5 kg/m².

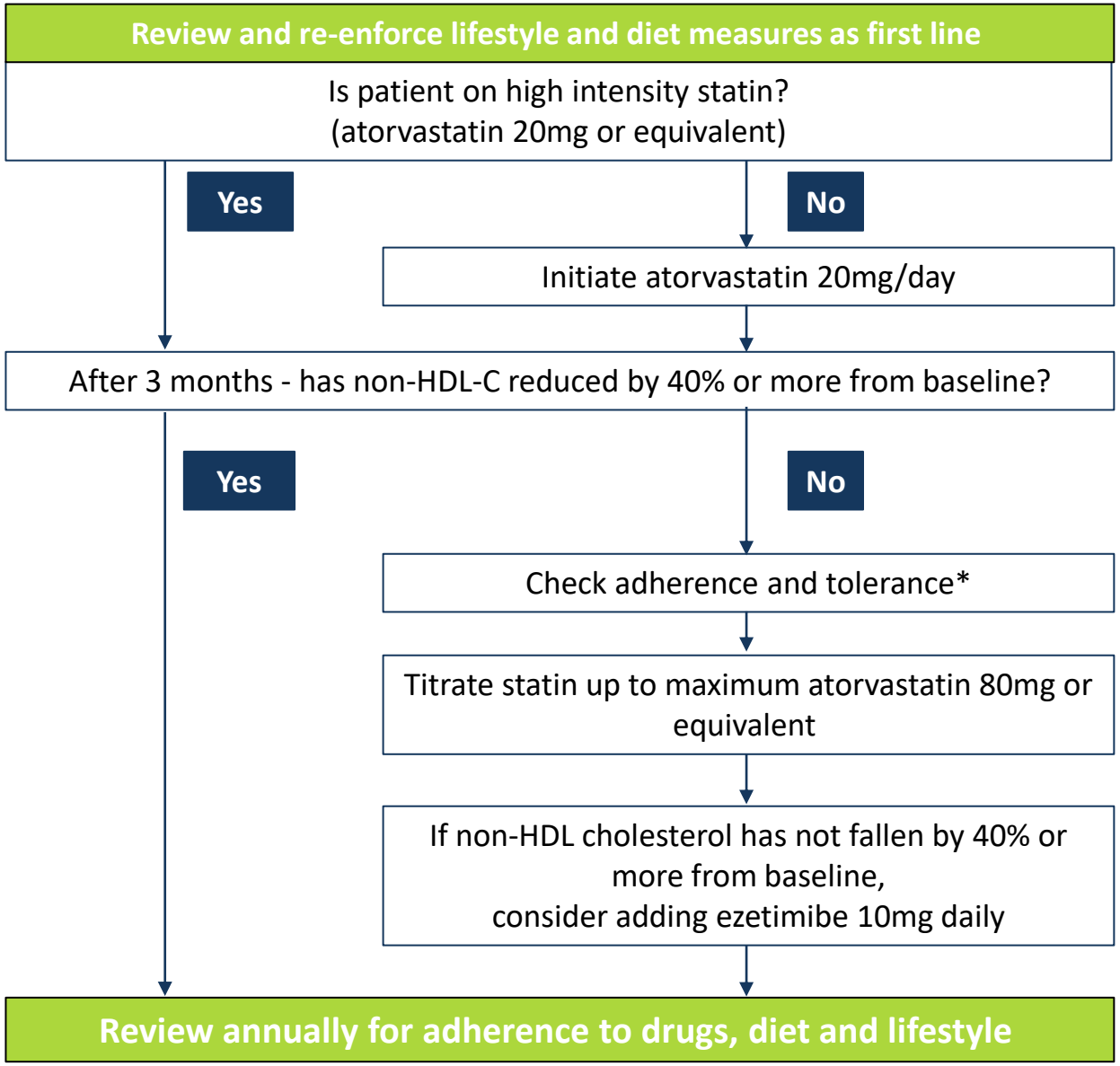
How does your 10-year score compare?

Your score

Your 10-year QRISK®2 score	37.9%
The score of a typical person with the same age, sex, and ethnicity*	16.8%
Relative risk**	2.3
Your QRISK® Heart Age***	> 84

* This is derived from all people of your age, sex and ethnic group, whatever their clinical information.
** Your relative risk is your risk divided by the typical person's risk.
*** Your QRISK® Heart Age is the age at which a typical person of your sex and ethnicity has your 10-year QRISK®2 score.

Optimisation Pathway for Primary Prevention



Optimal High Intensity statin for Primary Prevention (High intensity statins are substantially more effective at preventing cardiovascular events than low/medium intensity statins)	
Atorvastatin	20mg
Rosuvastatin	10mg

* If statin not tolerated, follow statin intolerance pathway and consider ezetimibe 10mg daily +/- bempedoic acid 180mg daily

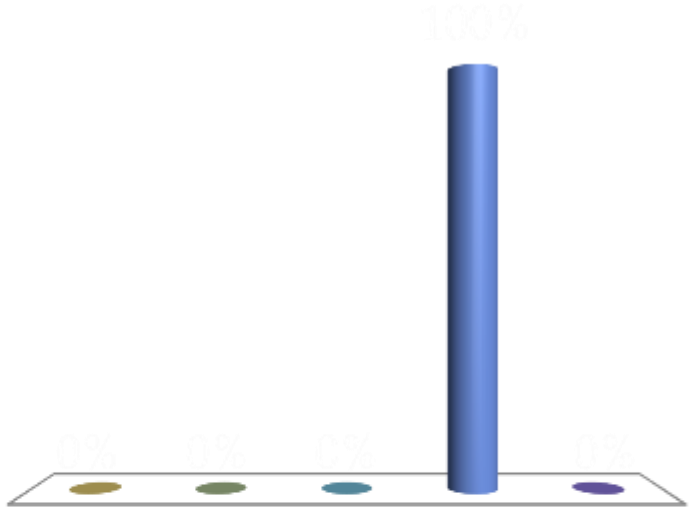
Subita

- Lifestyle issues addressed first
- Offer statin, if QRisk remains > 10%
  - *unlikely to be achieved by lifestyle alone so don't delay!*
- Rigorous control of BP
- Retain control of blood sugar
- *Would your management change if she had CKD?*

MENTIMETER:

In terms of her cholesterol, what would you recommend now for Subita?

A. Risk assessment using QRisk2
B. A statin
C. Lifestyle advice
D. A statin and lifestyle advice
E. Not sure



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CV Risk Assessment Recommendations

- Use the QRISK2 risk assessment tool to assess CVD risk for the primary prevention of CVD in people up to and including age 84 years
  - *except type I diabetes, CKD stage 3 or more, FH or pre-existing CVD*

Subita

- You contact Subita by phone to offer her a statin
- She is not keen because she heard they can cause side effects
- ***How would you manage the discussion?***

Shared Decision-Making Resources

Benefits per 10,000 people taking statin for 5 years	Events avoided
Avoidance of major CVD events in patients with pre-existing CVD & a 2mmol/l reduction in LDL	1,000
Avoidance of major CVD events in patients with no pre-existing CVD & a 2mmol/l reduction in LDL	500

Adverse events per 10,000 people taking statin for 5 years	Adverse events
Myopathy	5
Haemorrhagic Strokes	5-10
Diabetes Cases	50-100

Shared decision-making resources:

- BHF information on statins
- Heart UK: Information on statins
- NICE shared decision-making guide

Collins et al 2016 Lancet Systematic Review Lancet 2016; 388: 2532–61

Digital Resources to support self-management: Cholesterol

- **Heart UK resources** Healthy Eating, blood fats explained, understanding cholesterol, and Familial Hypercholesterolemia
- **British Heart Foundation resources** Understanding Cholesterol
- **Diet** Providing information and recipes for easy ways to eat better from the 'One You' website NHS advice on lowering cholesterol levels
- **Smoking cessation** NHS support, stop smoking aids, tools and practical tips
- **Exercise:** NHS 'One You'; iPrescribe app offers a tailored exercise plan by creating a 12-week exercise plan based on health information entered by the user; Getting active around the home: tips, advice and guidance on how to keep or get active in and around the home from Sport England; Dance to health: Online dance programme especially tailored to people over 55 years old
- **Alcohol**

Heart UK alcohol guidance
NHS Drink Less guidance

- **Mental Health** Tips and suggestions for looking after your mental health
- **Peer support** Communities of people living with high cholesterol

Richard

- Richard has stable angina and a history of angioplasty and stenting

- He is not currently treated with a statin and is therefore picked up by the UCLP secondary prevention searches as a priority one patient

- You can’t see any record of a statin in his notes

- His last recorded lipids are:
  - Total cholesterol 5.4mmol/L
  - Triglycerides 1.4mmol/L
  - HDL cholesterol 0.9mmol/L

MENTIMETER:

In terms of the statin, Richard should be offered:

A. Atorvastatin 80mg daily
B. Atorvastatin 20mg daily
C. Simvastatin 40mg daily
D. Rosuvastatin 10mg daily
E. Doesn’t matter which statin, as long as you start one

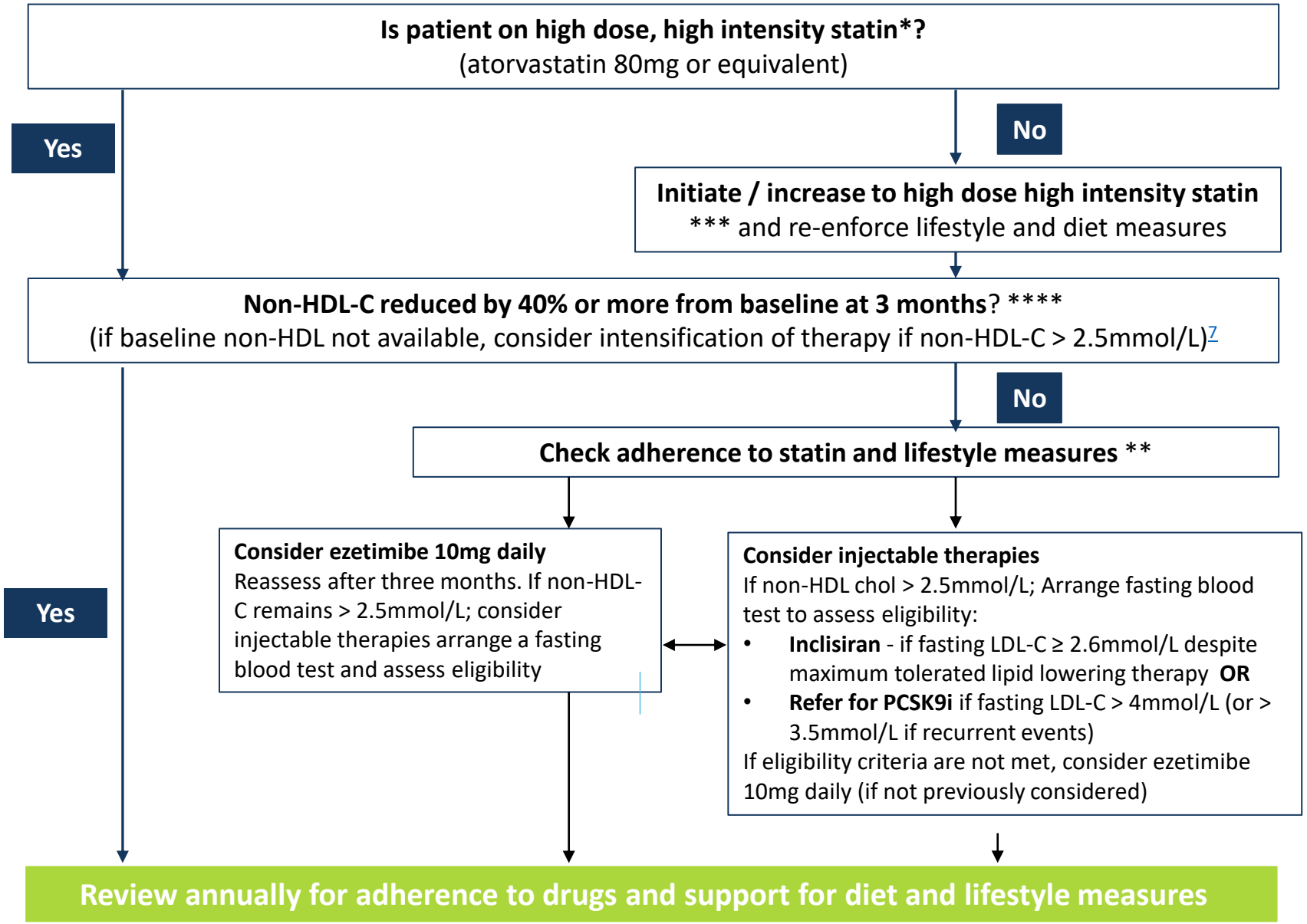
Secondary Prevention (including ACS)

- Start statin treatment in people with CVD with atorvastatin 80 mg. Use a lower dose of atorvastatin if any of the following apply:
  - potential drug interactions
  - high risk of adverse effects
  - patient preference

- Do not delay statin treatment in secondary prevention to manage modifiable risk factors

- If a person has acute coronary syndrome, do not delay statin treatment. Take a lipid sample on admission and about 3 months after the start of treatment

Optimisation Pathway for Secondary Prevention



Optimal High Intensity Statin for secondary prevention (High intensity statins are substantially more effective at preventing cardiovascular events than low/medium intensity statins)	
Atorvastatin	80mg
Rosuvastatin	20mg

* Dose may be limited if:
- eGFR<30ml/min
- Drug interactions
- Intolerance
- Older age / frailty

** **If statin not tolerated**, follow statin intolerance pathway and consider ezetimibe 10mg daily +/- bempedoic acid 180mg daily. If non HDL-C remains > 2.5mmol/L despite other lipid lowering therapies consider injectable therapies.

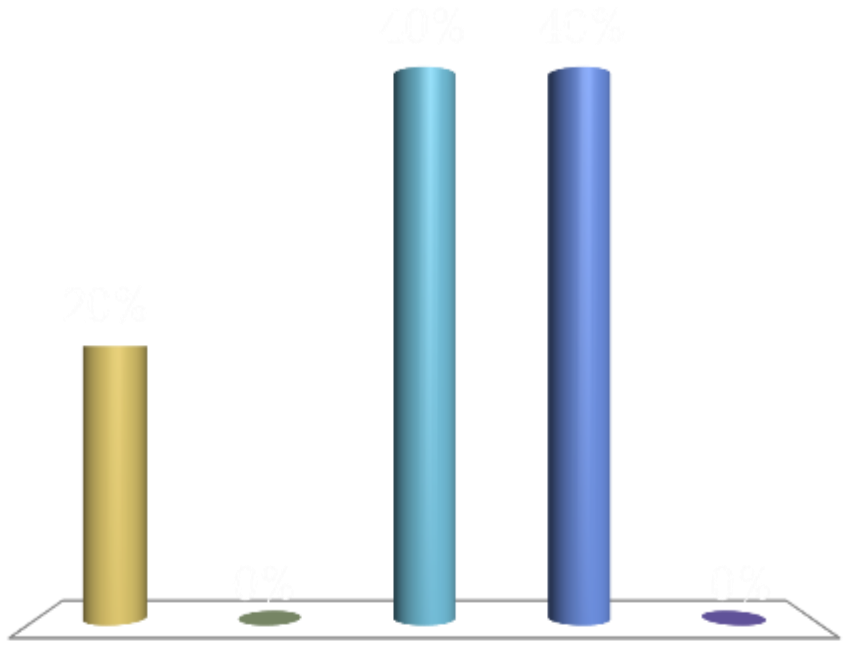
*** See statin intensity table

**** Current NICE Guidance recommends a 40% reduction in non- HDL cholesterol

MENTIMETER:

In terms of overall ability to lower cholesterol - which is the most potent statin?

A. Fluvastatin
B. Simvastatin
C. Rosuvastatin
D. Atorvastatin
E. Pravastatin



Statin Intensity Table – NICE recommends Atorvastatin and Rosuvastatin as First Line

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/moderate intensity statins will produce an LDL-C reduction of 20-30%

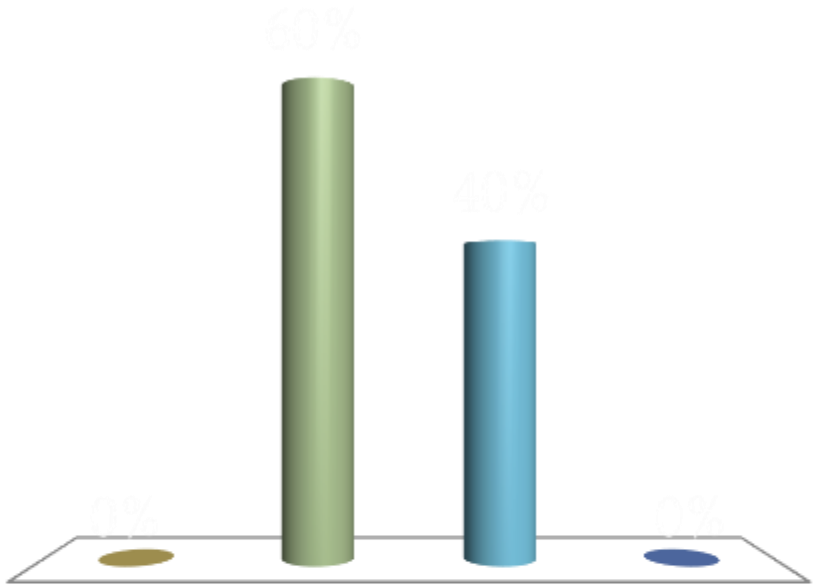
Medium intensity statins will produce an LDL-C reduction of 31-40%

High intensity statins will produce an LDL-C reduction above 40%

Simvastatin 80mg is not recommended due to risk of muscle toxicity

MENTIMETER:
What treatment target should we have for Richard?

A. Total chol < 5mmol/L and LDL chol < 3mmol/L
B. Total Chol < 4mmol/L and LDL Chol < 2mmol/L
C. 40% reduction in non-HDL cholesterol
D. Something else



Targets…. Do we need them?

- NICE (2014)
  - 40% reduction in non-HDL cholesterol
- JBS-3 (2013)
  - Statins are recommended as they are highly effective at reducing CVD events with evidence of benefit to LDL-c < 2mmol/L which justifies intensive non-HDL-c lowering
    - Non-HDL-c < 2.5mmol/L
- ACC / AHA / NI (2013)
  - Escalation of therapy beyond statins where LDL> 1.8 to LDL > 2.6mmol/L depending on an individuals risk of CV events
- ESC (2019)
  - Range of target levels LDL< 1.4 to LDL < 3mmol/L depending on an individuals risk of CV events

NICE endorsed AAC pathway (2020)

- 40% reduction in non-HDL cholesterol
- If baseline non-HDL cholesterol is not available – consider a target of non HDL chol < 2.5mmol/L

Non-HDL cholesterol =
Total Cholesterol – HDL cholesterol

Richard

The HCA contacts Richard to:

- Gather information — Blood results, BP, weight, smoking status
- Self-management — Education on cholesterol and CVD risk
- Behaviour change — Brief interventions and signposting e.g. smoking, weight, diet, exercise, alcohol

Robert explains that he did try a statin after his Percutaneous Coronary Intervention (PCI) and did not get on with it due to muscle pains so the HCA refers the patient to you.

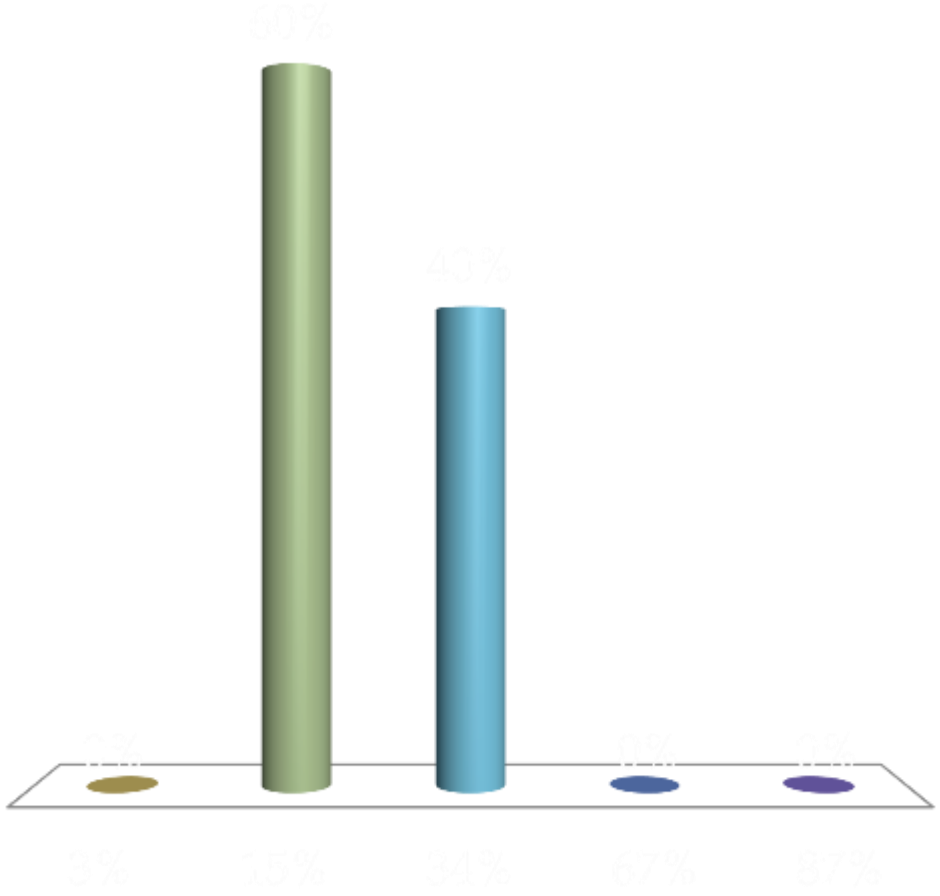
You arrange a remote consultation with Richard

- *How would you approach the discussion with Richard regarding taking a statin?*

MENTIMETER:

What % of patients complain of muscle pain on statins?

A. 3%
B. 15%
C. 34%
D. 67%
E. 87%



Muscle Pain with Statins

- 87% people on statins complain of muscle pain …… BUT

  85% of people not on statins complain of muscle pain

JAMA Intern Med. 2013;173(14):1318-1326

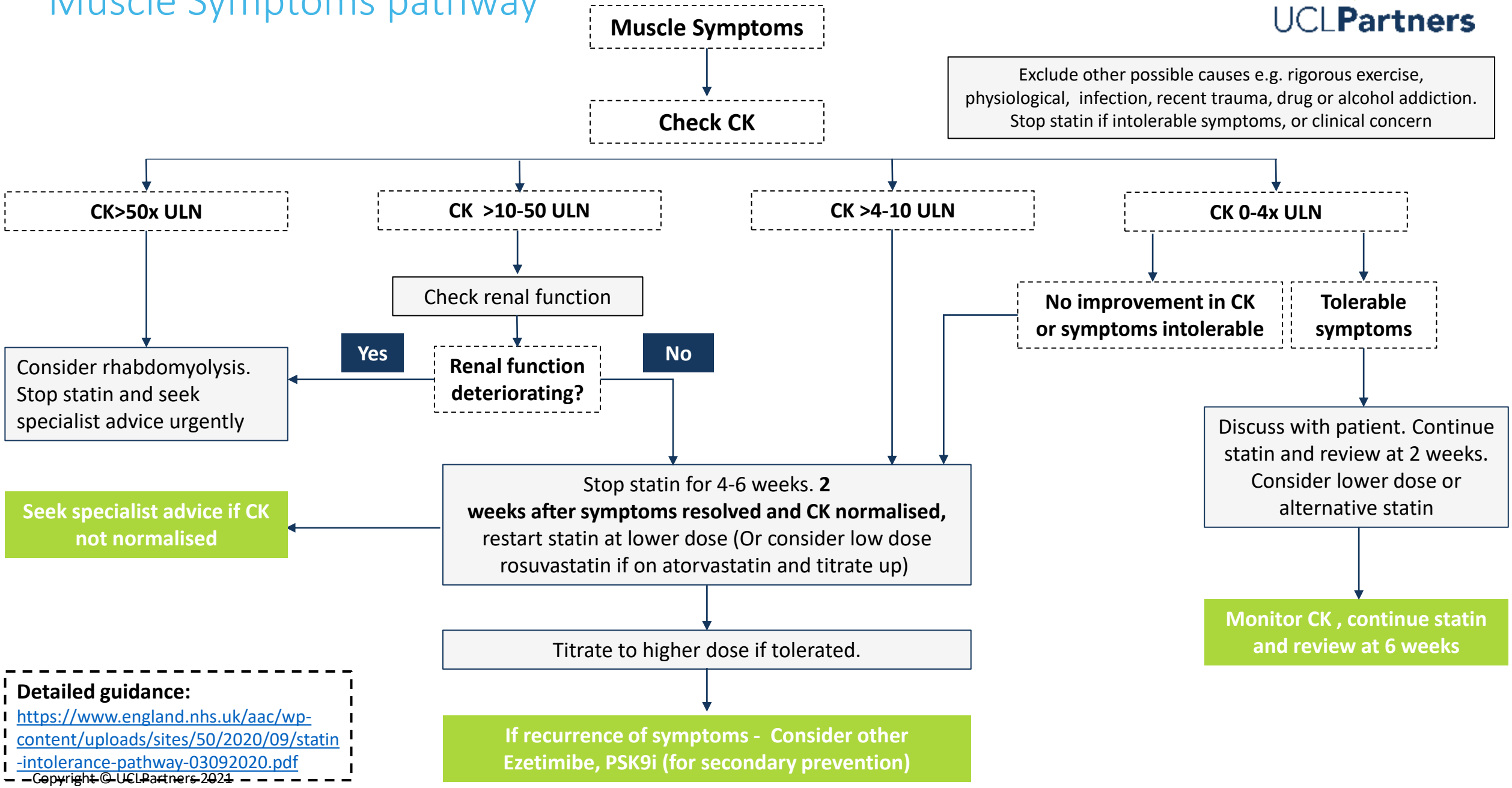
- A meta-analysis of over 4million patient records concluded the rate of complete statin intolerance was 9.1%

European Heart Journal, ehac015, https://doi.org/10.1093/eurheartj/ehac015

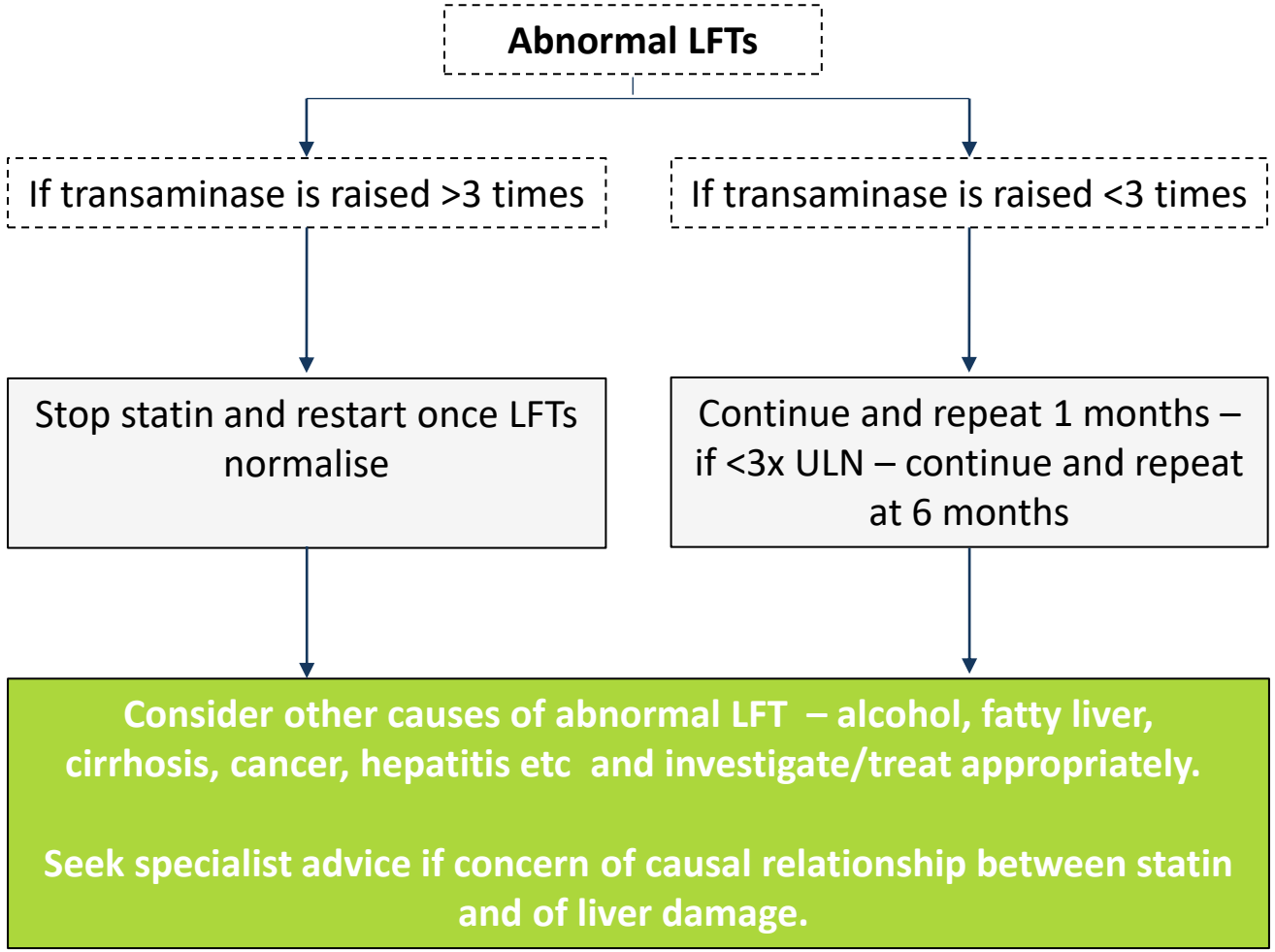
- In n=1 trials of patients reporting stain intolerance; muscle symptoms were no more common with statins than with placebo and more than half of patients can be re-initiated on a statin successfully

JAMA. 2021;325(16):1602. doi:10.1001/jama.2021.4801

Muscle Symptoms pathway



Abnormal liver function test pathway



- Do not routinely exclude from statin therapy people who have liver transaminase levels that are raised but are less than 3 times the upper limit of normal.
- Most adults with fatty livers are likely to benefit from statins and this is not a contraindication.
- Check Liver function at baseline, and once between 3 months and 12 months after initiation of statin therapy.

Back to Richard…

Following a discussions about the benefits and risk of statins, Richard agrees to try rosuvastatin

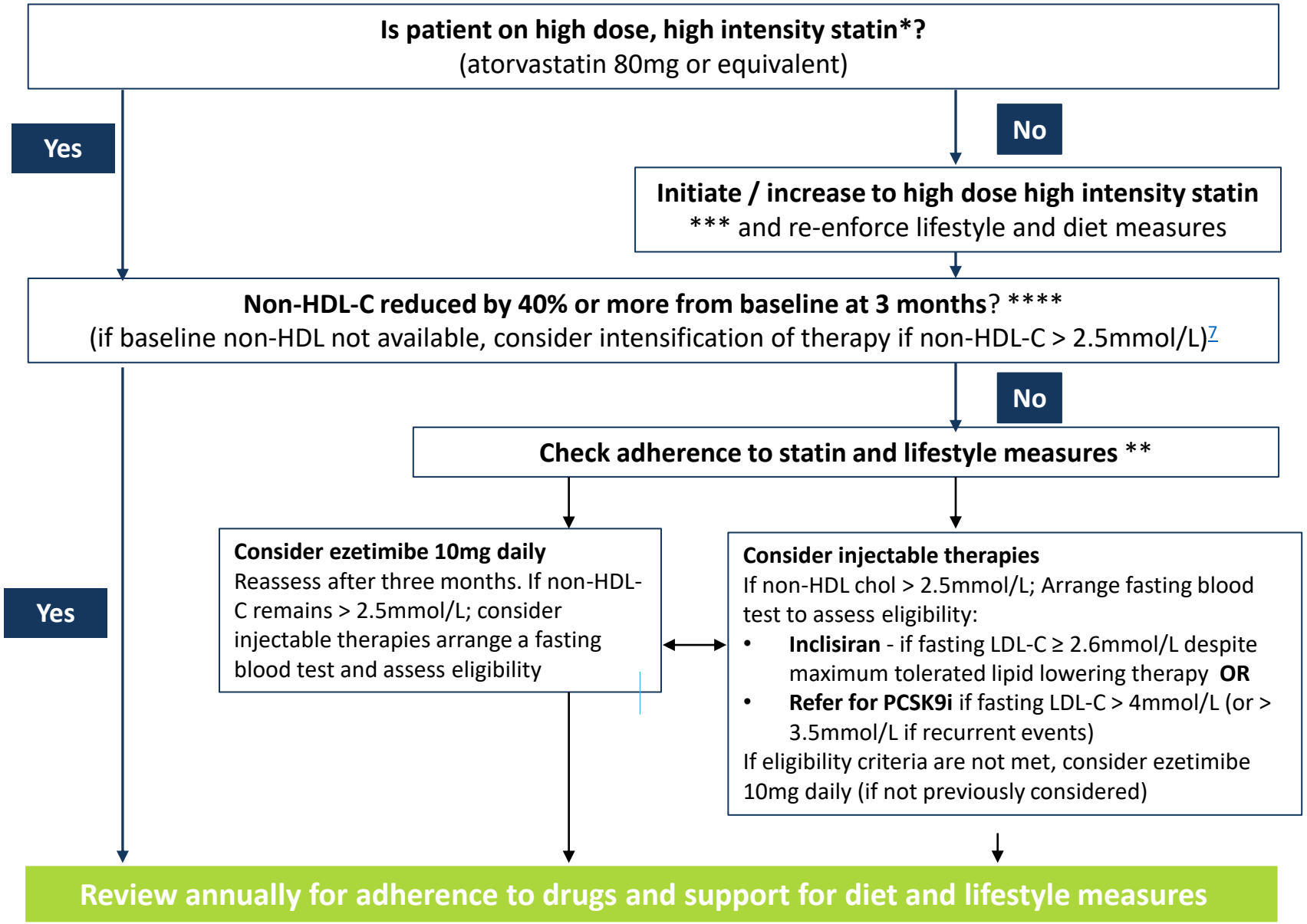
You decide to start him on a low dose (5mg daily) and increase if tolerated – aiming for high dose high intensity statin.

You make a plan to contact him again by phone in 2 weeks to see how he is getting on

You recommend that he also talks to the community pharmacist, as they can provide adherence support through the new medicines service

If he tolerates the statin, you plan to recheck his lipid levels in 3 months to review response to therapy

Optimisation Pathway for Secondary Prevention



Optimal High Intensity Statin for secondary prevention (High intensity statins are substantially more effective at preventing cardiovascular events than low/medium intensity statins)	
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** **If statin not tolerated**, follow statin intolerance pathway and consider ezetimibe 10mg daily +/- bempedoic acid 180mg daily. If non HDL-C remains > 2.5mmol/L despite other lipid lowering therapies consider injectable therapies.

*** See statin intensity table

**** Current NICE Guidance recommends a 40% reduction in non- HDL cholesterol

Case study 1

- Mr MP
- 56 Male
- STEMI and PCI to RCA (2019)
- Atorvastatin 80 mg OD
- Bloods (June 2021)
  - TC 6.2 mmol/L
  - LDL 4.5 mmol/L
  - HDL 1.1 mmol/L
  - Trig 1.32 mmol/L
  - TFTs / LFTs / U+Es / HbA1c – unremarkable
- BP 132/74 mmHg; Wt 83 kg; BMI 27 kg/m^2; non-smoker

Fictional case study for illustrative purposes

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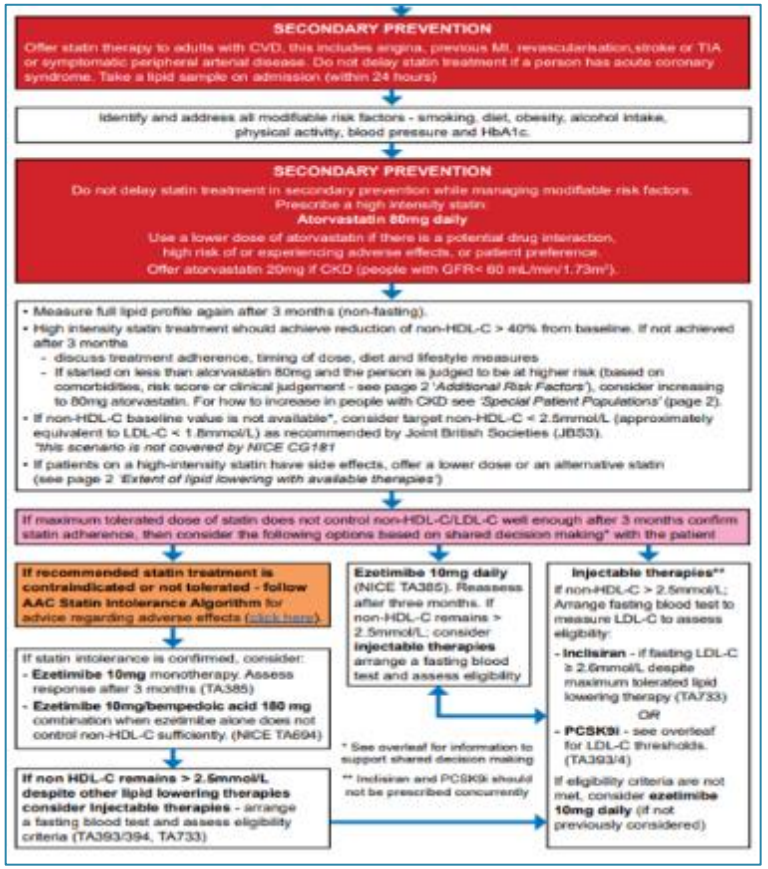

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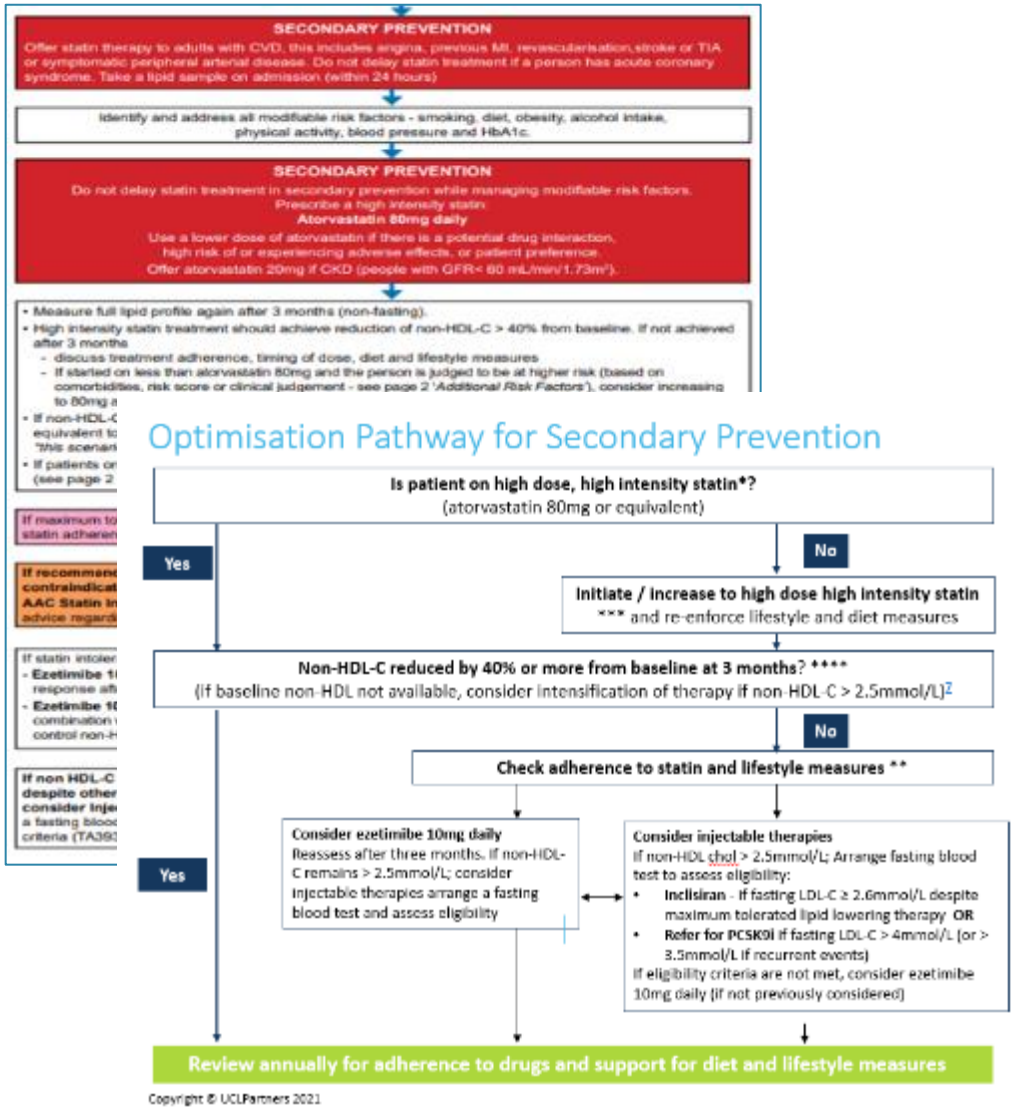


MENTIMETER –

WHAT do you do next?

- Continue statin monotherapy
- Add ezetimibe
- Add bempedoic acid
- Add inclisiran
- Add PCSK9i

Case study 1 continued

- Offer lifestyle advice (diet and exercise for weight loss)
- Confirm adherence
- Add ezetimibe 10 mg OD

> • If maximum tolerated dose of statin does not achieve non-HDL-C reduction > 40% of baseline value and/or non-HDL-C < 2.5mmol/L after 3 months consider adding Ezetimibe 10mg OD (NICE TA385)

- Repeat lipid panel after 3 months
  - TC 5.0 mmol/L
  - LDL 3.6 mmol/L
  - HDL 1.0 mmol/L
  - Trig 0.89 mmol/L

SPECIALIST SERVICES

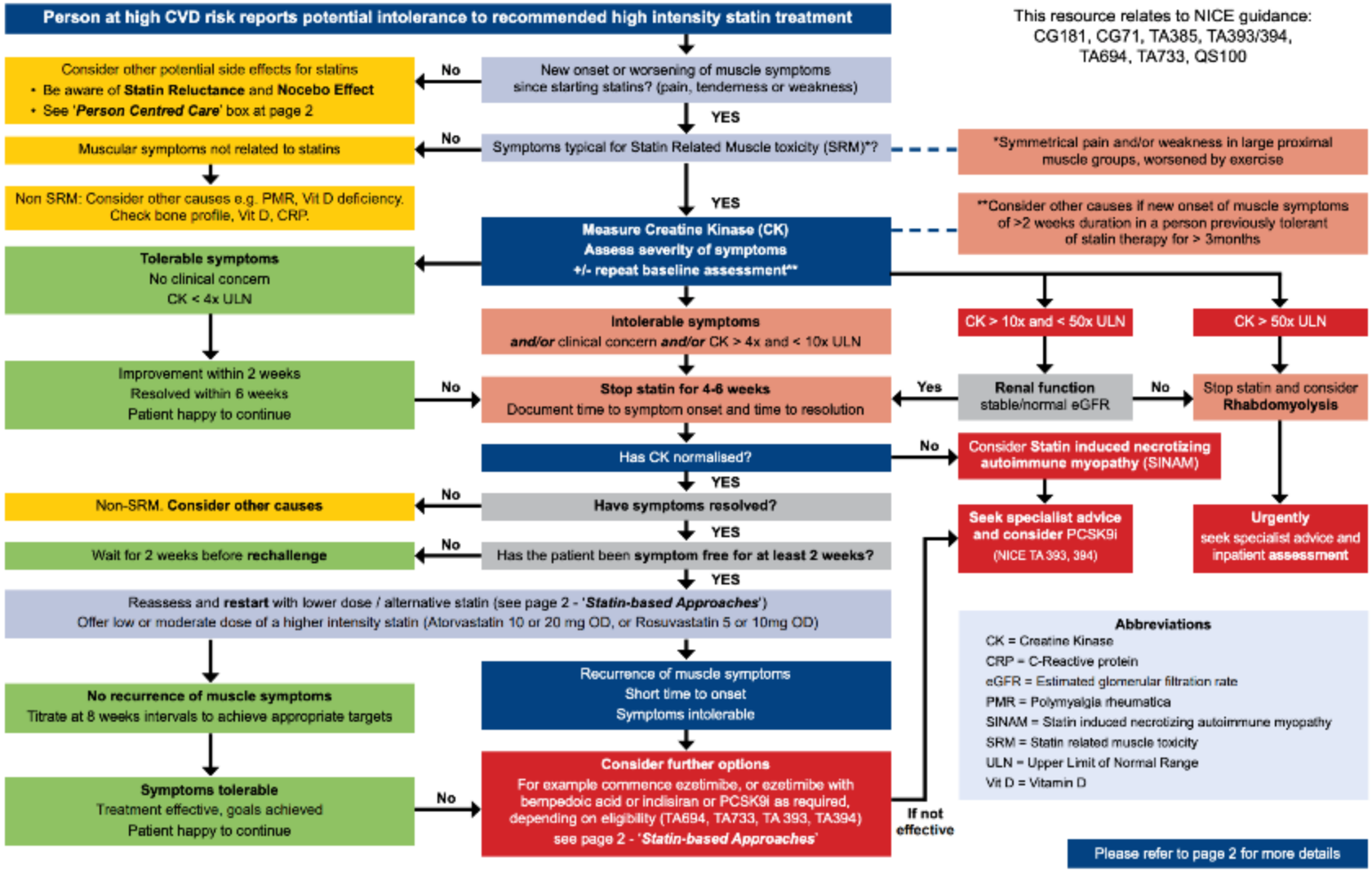
Scope of specialist service available locally may include; Lipid Clinic, PCSK9i clinic (offering initiation and subsequent follow up), FH Genetic Diagnosis and Cascade testing, Lipoprotein Apheresis service. NICE eligibility criteria for PCSK9i and fasting LDL-C thresholds are summarised below.

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	

- Possible FH + CVD + LDL > 3.5 mmol/L
  - Refer for specialist assessment and consideration of PCSK9i

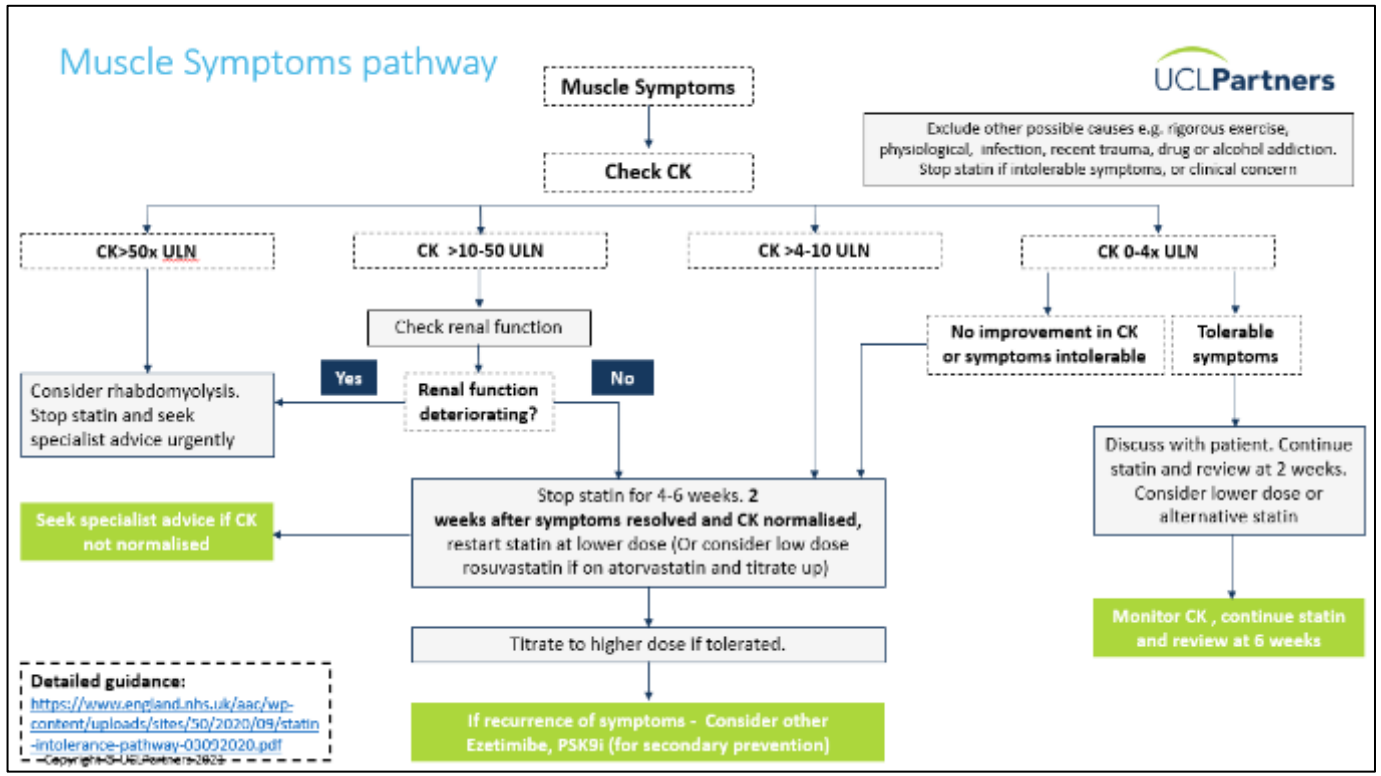
Statin intolerance pathway

- K)22.pdf Accessed: May 2022



Case study 2

- Mrs AS - 67F
- No History of CVD / QRisk 18.3%
- Atorvastatin 20mg OD
  - Discontinued Oct 2020 due to muscle pain
- Bloods (Sept 2020)
  - TC 5.2 mmol/L
  - LDL 3.3 mmol/L
  - HDL 1.4 mmol/L
  - Trig 1.17
  - TFTs / LFTs / U&Es / HbA1c – unremarkable
  - BP 109/63 mmHg; Wt 62kg; BMI 22kg/m^2; smoker



BHC Fictional case study for illustrative purposes
BP, Blood pressure; BMI, Body mass index; CVD, Cardiovascular disease; HbA1c, Hemoglobin A1c; HDL, High-density lipoprotein; LDL, Low-density lipoprotein; LFT, Liver function test; TC, Total cholesterol; TFT, Thyroid function test; U&E, Urea and electrolytes, Wt weight

MENTIMETER

WHAT do you do next?

- Continue statin monotherapy
- Add ezetimibe
- Add bempedoic acid
- Add inclisiran
- Add PCSK9i

Case study 2 (continued)

- Offer lifestyle advice (smoking cessation)
- Assess symptoms (nature / onset)
- Rechallenge with rosuvastatin 5mg OD
- Measure CK
  - 720 U/L (range 22-198 U/L)
- Stop statin 4-6 weeks
- Reassess symptoms and CK
  - 134 U/L with resolution of symptoms

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%
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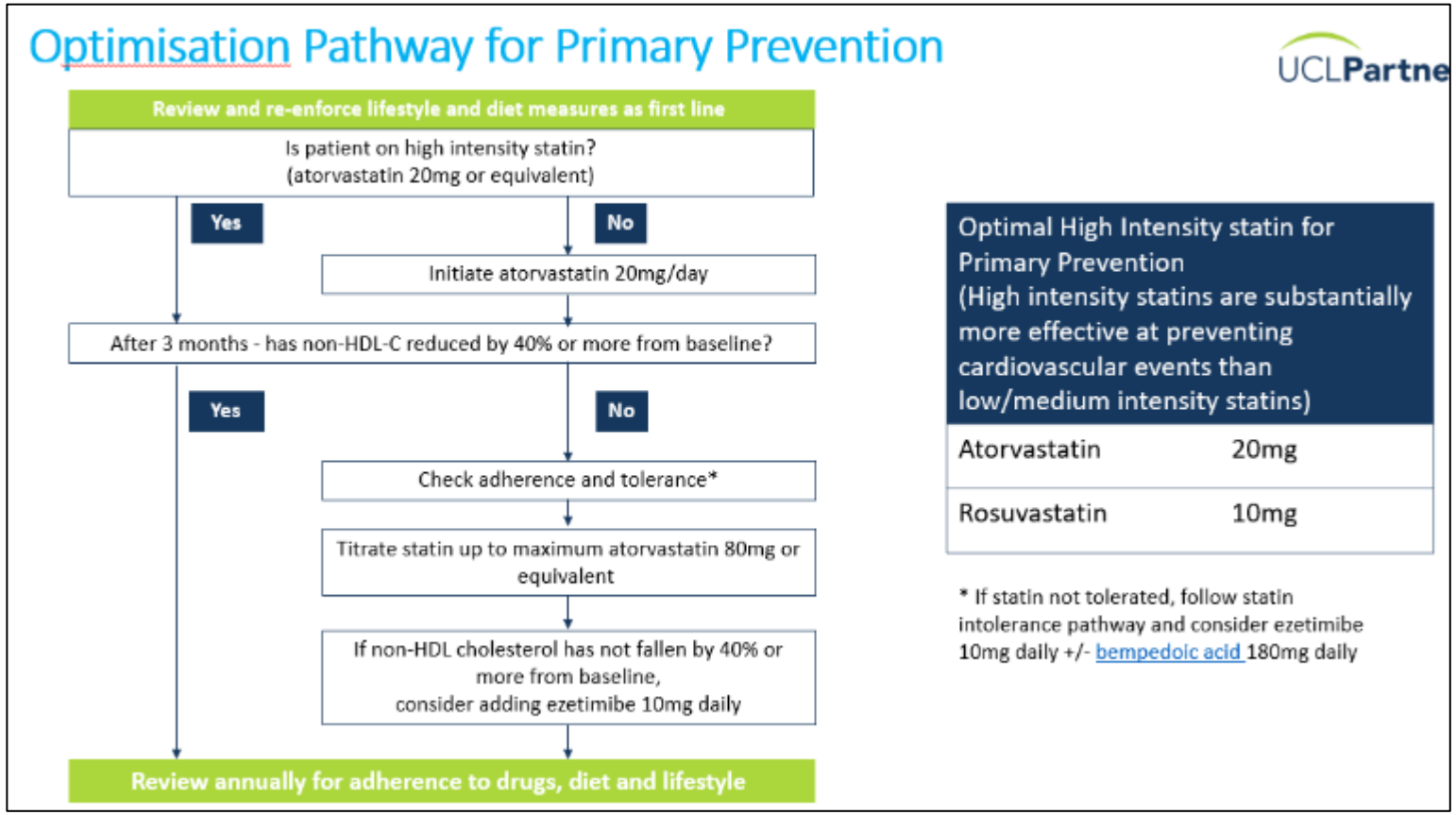
Atorvastatin + Ezetimibe 10mg		52%	54%	57%	61%

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

*BHC Fictional case study for illustrative purposes
CK, Creatine kinase: HDL, High-density lipoprotein; OD, Once-daily.

Case Study 2 continued

- Start ezetimibe 10mg daily
- Repeat non-HDLc after 3 months
  - <40% reduction from baseline
- Add bempedoic acid



Bempedoic acid for use in statin intolerance

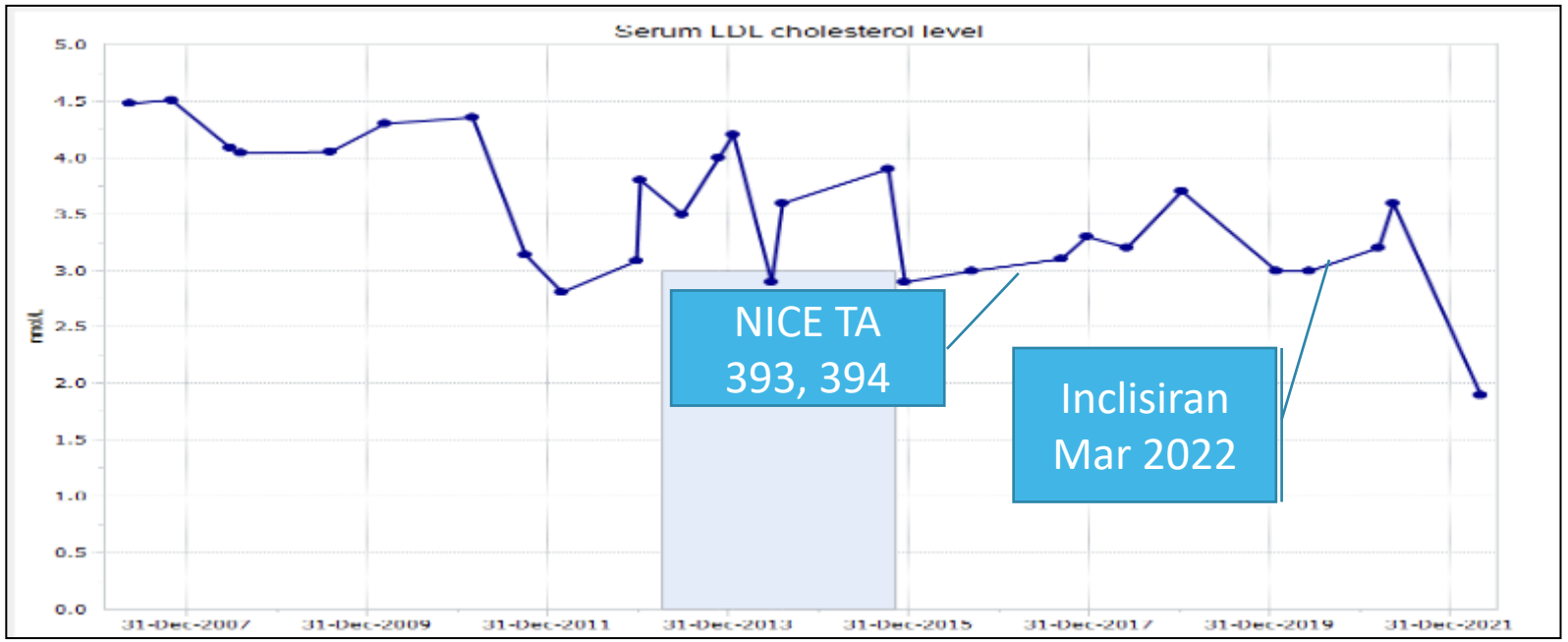
- Bempedoic acid with ezetimibe is recommended as an option for treating primary hypercholesterolaemia (heterozygous familial and non-familial) or mixed dyslipidaemia as an adjunct to diet in adults. It is recommended only if:
  - statins are contraindicated or not tolerated
  - ezetimibe alone does not control low-density lipoprotein cholesterol well enough
- Bempedoic acid with ezetimibe can be used as separate tablets or a fixed-dose combination
- The recommended dose is one film-coated tablet of 180 mg taken once daily
- Bempedoic acid lowers LDL-C by an additional 28% (range 22-33%) when combined with ezetimibe
- Bempedoic acid was associated with a slightly increased risk of tendon rupture, involving the biceps tendon, rotator cuff, or Achilles tendon. Other more commonly reported adverse events in clinical trials were upper respiratory tract infection, back pain, abdominal pain or discomfort, bronchitis, pain in extremity, anaemia, and elevated liver enzymes
- More information on bempedoic acid can be found at: https://www.medicines.org.uk/emc/product/11743/smpc#gref

Case study 3

- Mr RL; 74M, Right Lacunar Infarct
- PMH: Hypertension, diabetes, obesity
- Statin History: Atorvastatin 10mg; Pravastatin 10mg; Simvastatin 10mg & 40mg; Rosuvastatin 5mg
- Weight 104kg; BMI 35.7kg/m2 ; ex-smoker; Alcohol consumption: 14units/week; BP 141/81mmHg
- Lipid profile results: TC 6.2mmol/L; LDL 3.6mmol/L; HDL 1.51mmol/L; non-HDL 4.7mmol/L; Triglycerides 2.45mmol/
- Cr 93mmol/L; CrCl 83ml/min; ALT 23iu/L; HbA1c 63mmol/mol; TSH 1.57mU/L

Current medication:

- **Ezetimibe 10mg daily**,
- clopidogrel 75mg daily
- felodipine 7.5mg daily
- valsartan 120mg daily
- metformin MR 500mg daily
- repaglinide 12-14mg in divided doses
- lansoprazole 15mg daily



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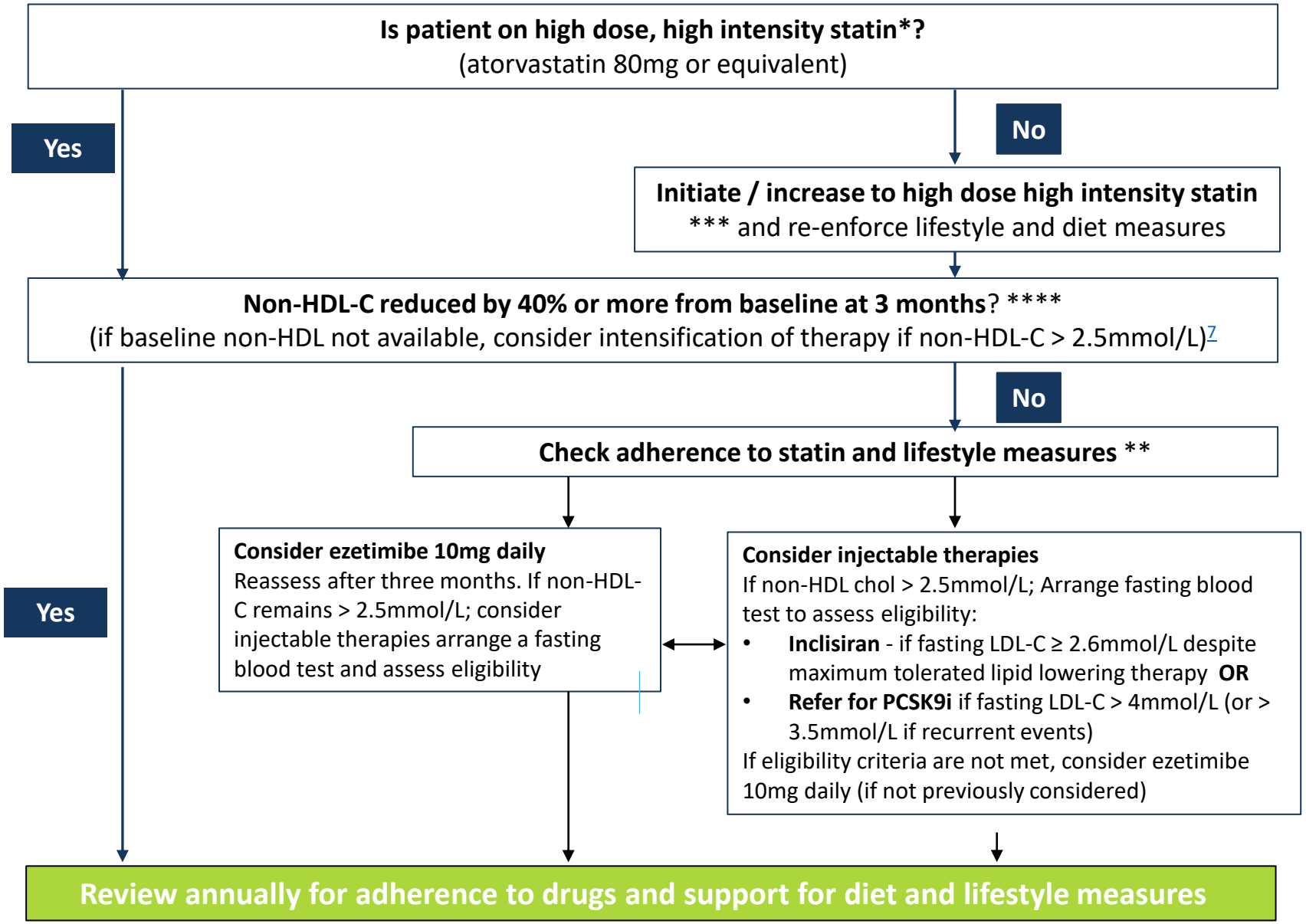
Optimisation Pathway for Secondary Prevention



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*** See statin intensity table

**** Current NICE Guidance recommends a 40% reduction in non- HDL cholesterol

Inclisiran for secondary prevention

- Inclisiran is indicated only for patients:
  - With established CVD
  - On optimal oral lipid lowering therapy including high intensity statins where tolerated
  - Where LDL-C remains ≥ 2.6mmol/L
- Inclisiran lowers LDL-C by approx. 50%, but there are currently no long term CVD outcome data or safety data which should be taken into account when making a shared decision with the patient about appropriate treatment choices
- Inclisiran (Leqvio®) is administered at a dose of 284mg by subcutaneous injection
- It should be given at month 0 (initiation), month 3, month 9 and then every 6 months thereafter.
  - If a planned dose is missed by more than 3 months, a new dosing schedule should be started – inclisiran should be administered initially, again at 3 months, followed by every 6 months.
  - It should be administered by a healthcare professional into the abdomen; alternative injection sites include the upper arm or thigh.
- The only adverse reactions associated with inclisiran reported to date are injection site reactions (8.2%)
- More information on inclisiran can be found at: https://www.medicines.org.uk/emc/product/12039/smpc#gref

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