

# Hyperlipidemia Management for Patients with Diabetes

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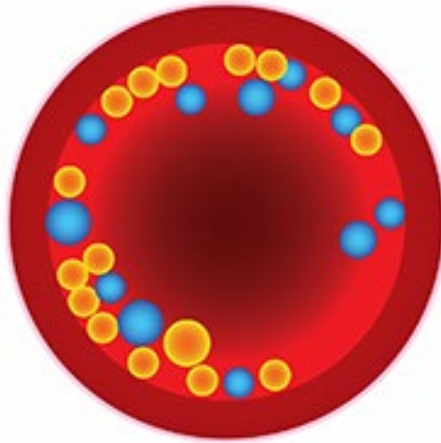
# cholesterol



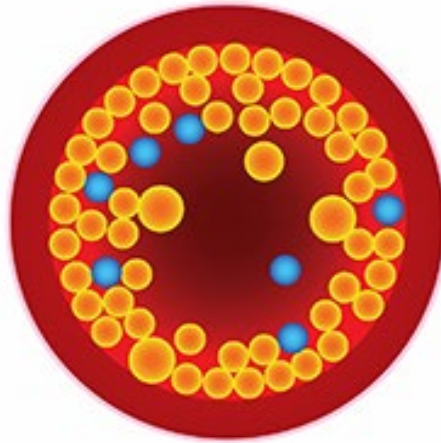
**HDL (GOOD)**



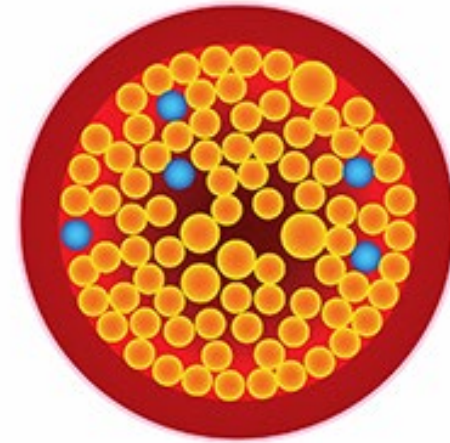
**LDL (BAD)**



**LOW**



**NORMAL**



**HIGH**

# Objectives

Assess cardiovascular risk in individuals with diabetes and apply risk stratification to guide lipid management.

Describe the current ADA and AHA/ACC guideline targets for hyperlipidemia in adults with diabetes.

Develop a patient-centered plan that combines lifestyle modification, pharmacotherapy, and monitoring to optimize hyperlipidemia management in patients with diabetes .

# Lipid disorders



Most common pattern of dyslipidemia is elevated triglycerides and decreased high density lipoprotein (HDL) levels<sup>3</sup>



Dyslipidemia is extremely common in T2DM affecting around 72-85% of patients<sup>3</sup>



LDL-cholesterol has been the primary predictor of CVD

# When to screen and monitor

1

Obtain a lipid profile at the time of diagnosis or initial medical evaluation

2

You can screen every 5 years if under the age of 40 or more frequently if indicated (generally 1-2 years if abnormal)<sup>3</sup>

3

Obtain a lipid profile about 4-12 weeks after you initiate a statin to see if there is a change to see if dose needs to be titrated<sup>3</sup>

# ASCVD Risk Assessment



ASCVD Risk Estimator Plus

Estimate Risk

Therapy Impact

App should be used for primary prevention patients (those without ASCVD) only.

Current Age ⓘ \*

Age must be between 20-79

Sex \*

Male Female

Race \*

White African American Other

Systolic Blood Pressure (mm Hg) \*

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) \*

Value must be between 60-130

Total Cholesterol (mg/dL) \*

Value must be between 130 - 320

HDL Cholesterol (mg/dL) \*

Value must be between 20 - 100

LDL Cholesterol (mg/dL) ⓘ ○

Value must be between 30-300

History of Diabetes? \*

Yes No

Smoker? ⓘ \*

Current ⓘ Former ⓘ Never ⓘ

On Hypertension Treatment? \*

Yes No

On a Statin? ⓘ ○

Yes No

On Aspirin Therapy? ⓘ ○

Yes No

## The American Heart Association PREVENT™ Online Calculator

- Developed by the American Heart Association in 2023, the Predicting Risk of Cardiovascular Disease EVENTS (PREVENT) equations estimate 10-year and 30-year risk for total cardiovascular disease (CVD), including atherosclerotic CVD (ASCVD) and heart failure (HF). It is the first risk tool to combine cardiovascular, kidney, and metabolic health measures to guide primary prevention-focused treatment decisions.<sup>16</sup>
- The equations were derived and validated using data from over 6.5 million U.S. adults across multiple datasets, and they are validated for adults ages 30–79 years without known CVD.<sup>16</sup>
- The PREVENT calculator, based on the PREVENT equations, uses required clinical information to estimate CVD risk. Three optional predictors, urine albumin-creatinine ratio (UACR), hemoglobin A1c (HbA1c), and social deprivation index (SDI), can further personalize risk estimates.<sup>16</sup>
- The PREVENT calculator provide separate 10-year and 30-year estimates for total CVD (PREVENT-CVD), ASCVD (PREVENT-ASCVD), and HF (PREVENT-HF). The default display is PREVENT-CVD, but each outcome can be selected individually. Because ASCVD and HF are modeled independently, their combined risk may exceed the total CVD estimate.<sup>16</sup>



**PREVENT™ Online Calculator**

Welcome to the American Heart Association Predicting Risk of Cardiovascular Disease Events (PREVENT™). This app shows the risk of cardiovascular disease events for primary prevention patients (those without atherosclerotic disease or heart failure) only.

Sex  Male  Female

Age  
30-79 years

Total Cholesterol  
130-320 mg/dL

HDL Cholesterol  
20-100 mg/dL

SBP  
90-200 mmHg

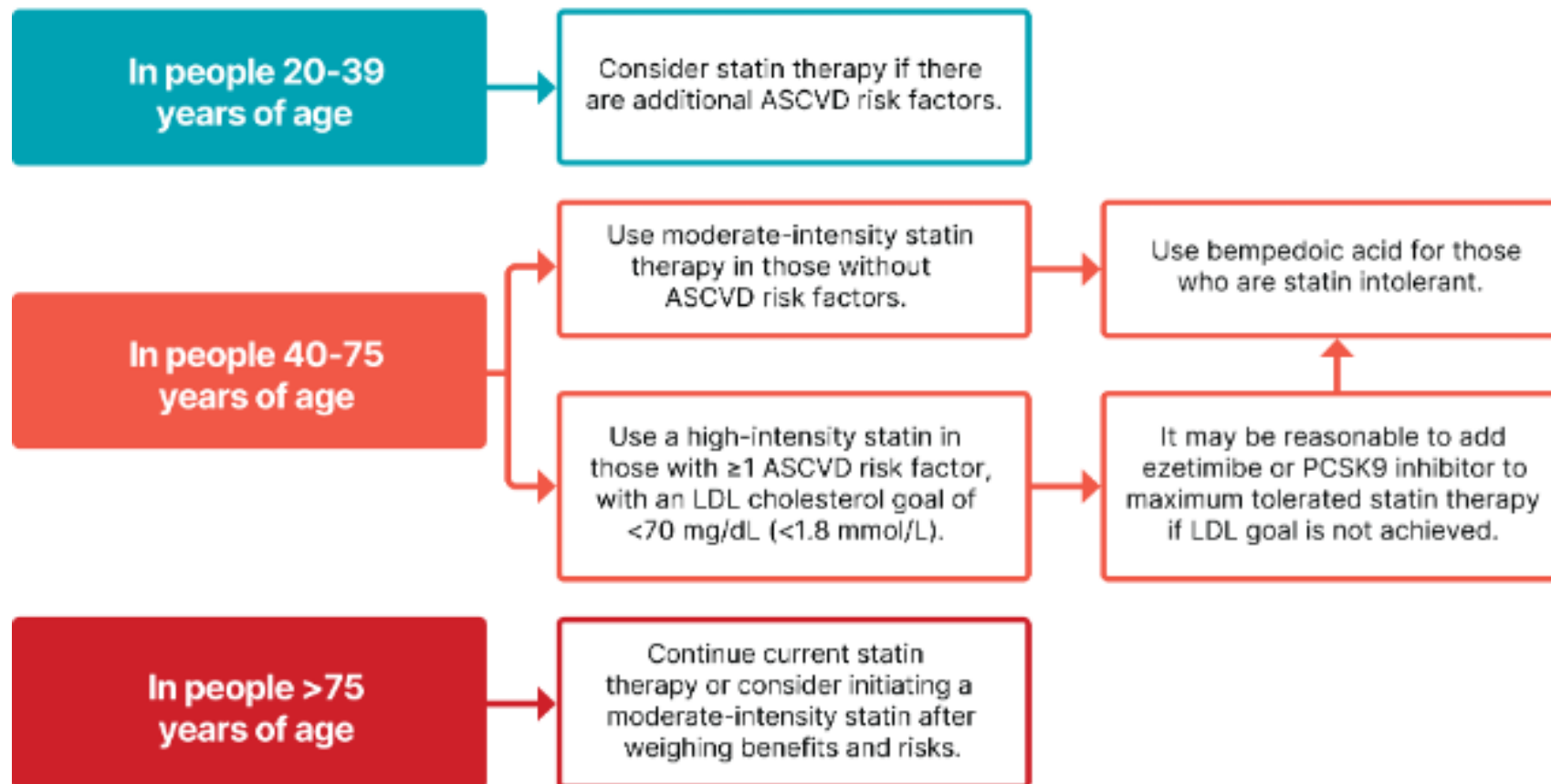
BMI  
18.5-39.9

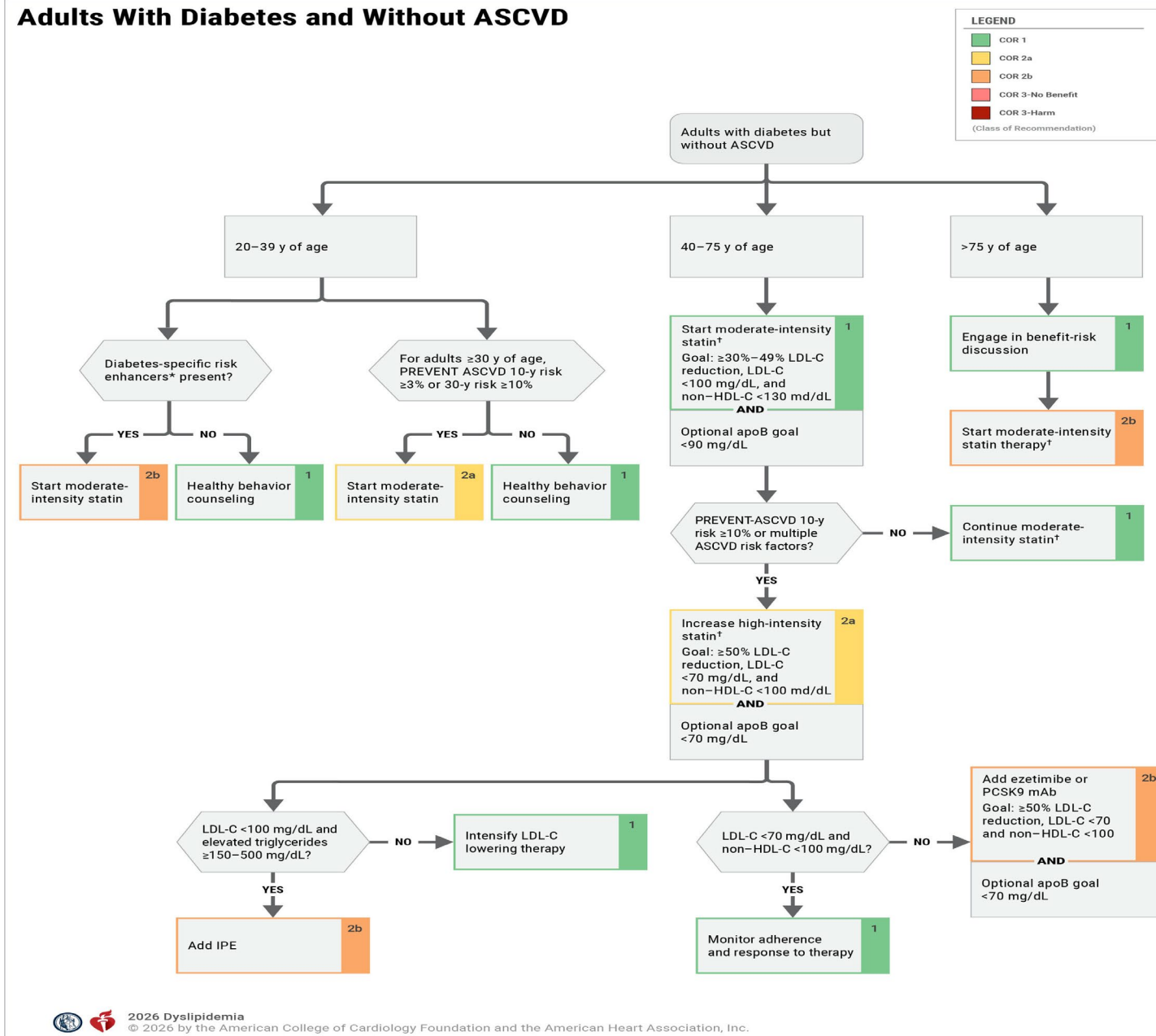
eGFR

[professional.heart.org/prevent](https://professional.heart.org/prevent)

# When to initiate statins

Lipid Management for Primary Prevention of Atherosclerotic Cardiovascular Disease Events in People With Diabetes in Addition to Healthy Behavior Modification





Roger S. Blumenthal.  
 Circulation. 2026  
 ACC/AHA/AACVPR/ABC/A  
 CPM/ADA/AGS/APhA/ASP  
 C/NLA/PCNA Guideline on  
 the Management of  
 Dyslipidemia: A Report of  
 the American College of  
 Cardiology/American Heart  
 Association Joint  
 Committee on Clinical  
 Practice Guidelines,  
 Volume: 153, Issue: 17,  
 Pages: e1154-e1276, DOI:  
 (10.1161/CIR.000000000000  
 01423)

# Hyperlipidemia Recommendations



For patients with diabetes aged 40-75 years without ASCVD, use moderate-intensive statin therapy in addition to lifestyle therapy



For patients of all ages with diabetes AND ASCVD, high intensity statin therapy should be initiated with lifestyle therapy <sup>1</sup>



Statins not recommended in pregnancy\*<sup>1</sup>

# Hyperlipidemia Recommendations

For patients with diabetes aged 40-75 years WITH ASCVD, use high-intensity statin to reduce LDL by  $\geq 50\%$  of baseline and to target goal LDL of  $< 70$  mg/dL<sup>12</sup>

- If these patients have multiple ASCVD risk factors and an LDL  $\geq 70$ , it is reasonable to add ezetimibe or a PCSK9 inhibitor to maximum tolerated statin therapy<sup>12</sup>

In adults with diabetes  $> 75$  years already on statin therapy, you can continue their statin therapy<sup>12</sup>

# Other considerations

- Can consider moderate intensity statin for the following<sup>1</sup>
  - Patients younger than 40 years of age with additional ASCVD risk factors
  - Type 1 Diabetes with additional ASCVD risk factors
  - Patients with diabetes who are 75 years or older after discussing potential risks and benefits

# When to initiate hyperlipidemia/dyslipidemia medications

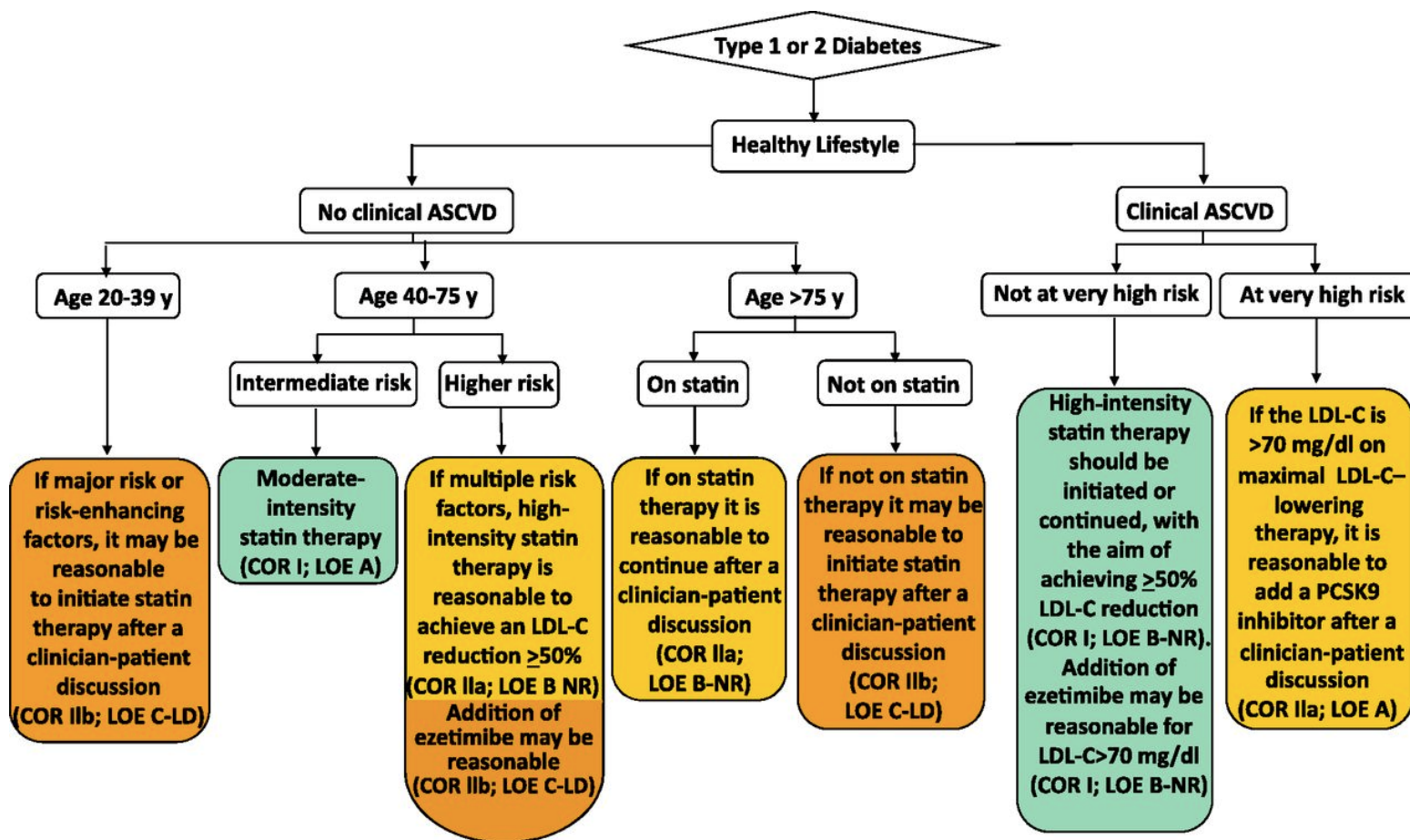


Figure 7: Statin Algorithm. Goldberg, 2018. Adapted from Goldberg, R. B., Stone, N. J., & Grundy, S. M. (2020). The 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APHA/ASPC/NLA/PCNA guidelines on the management of blood cholesterol in diabetes. *Diabetes Care*, 43(8), 1673–1678. <https://doi.org/10.2337/dci19-0036>

# Moderate to High dose Statins

High-intensity statin therapy (lowers LDL cholesterol by $\geq 50\%$ )	Moderate-intensity statin therapy (lowers LDL cholesterol by 30–49%)
Atorvastatin 40–80 mg	Atorvastatin 10–20 mg
Rosuvastatin 20–40 mg	Rosuvastatin 5–10 mg
	Simvastatin 20–40 mg
	Pravastatin 40–80 mg
	Lovastatin 40 mg
	Fluvastatin XL 80 mg
	Pitavastatin 1–4 mg

- Table 6: Statin Potency Chart: Diabetes Care, 2020.
- Adapted from: Cardiovascular disease and risk Management: Standards of medical care In Diabetes—2021. (2020). *Diabetes Care*, 44(Supplement 1). <https://doi.org/10.2337/dc21-s010>

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**Table 6. High-, Moderate-, and Low-Intensity Statin Therapy\***

	High-Intensity	Moderate-Intensity	Low-Intensity
<b>Expected % LDL-C Reduction†</b>	≥50%	30%–49%	<30%
<b>Preferred Statins</b>	<b>Atorvastatin (40 mg) 80 mg</b> <b>Rosuvastatin 20 mg (40 mg)</b>	<b>Atorvastatin 10 mg (20 mg)</b> <b>Rosuvastatin (5 mg) 10 mg</b>	
<b>Other Statins</b>	–	Fluvastatin XL 80 mg <b>Fluvastatin 40 mg BID</b> <b>Lovastatin 40 mg (80 mg)</b> <b>Pitavastatin 1, 2, 4 mg</b> <b>Pravastatin 40 mg (80 mg)</b> <b>Simvastatin 20, 40 mg‡</b>	Fluvastatin 20, 40 mg <b>Lovastatin 20 mg</b> Pravastatin 10, 20 mg Simvastatin 10 mg

Roger S. Blumenthal. Circulation. 2026  
ACC/AHA/AACVPR/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA  
Guideline on the Management of Dyslipidemia: A Report of the  
American College of Cardiology/American Heart Association Joint  
Committee on Clinical Practice Guidelines, Volume: 153, Issue: 17,  
Pages: e1154-e1276, DOI: (10.1161/CIR.0000000000001423)

# When to go beyond statins?

“For patients with diabetes and ASCVD considered high risk if LDL cholesterol is  $\geq 70$  mg/dL on maximally tolerated statin dose, consider adding additional LDL lowering therapy such as ezetimibe or PCSK9 inhibitor” (Jialal 2019)

- Ezetimibe is often cheaper in cost

In adults with diabetes and 10 year ASCVD risk of 20% or higher, it may be reasonable to add ezetimibe to maximally tolerated statin therapy to reduce LDL cholesterol levels by 50% or more<sup>1</sup>

“If patients with ASCVD or other CV risk factors on a statin with controlled LDL cholesterol but elevated triglycerides (135-499 mg/DL), the addition of icosapent ethyl can be considered to reduce CVD risk.” (Jialal 2019)

Statin + Fibrate combination generally not recommended, hasn't been shown to improve ASCVD outcomes<sup>1</sup>

Statin + Niacin combination therapy hasn't been shown to prove additional CV benefit above statins only and may increase the risk of stroke<sup>1</sup>

In people with diabetes intolerant to statin therapy, treatment with bempedoic acid is recommended to reduce cardiovascular event rates as an alternative cholesterol-lowering plan.<sup>13</sup>

# What is the goal?

Lowering of LDL by 50% or more if your ASCVD risk is 20% or higher<sup>3</sup>

- Can add second agent if needing to reduce LDL cholesterol levels by 50% or more

Primary prevention

- LDL goal less than 70

Secondary Prevention

- LDL goal less than 55

Diabetes is considered a high-risk condition for ASCVD

## Lipoprotein Goals for ASCVD Risk Reduction

Patient population	LDL-C <100 mg/dL (2.6 mmol/L) Non-HDL-C <130 mg/dL (3.4 mmol/L)	LDL-C <70 mg/dL (1.8 mmol/L) Non-HDL-C <100 mg/dL (2.6 mmol/L)	LDL-C <55 mg/dL (1.4 mmol/L) Non-HDL-C <85 mg/dL (2.2 mmol/L)
<b>Primary prevention</b>	PREVENT-ASCVD <10% • If TG ≥150 mg/dL to 499 mg/dL, apoB goal: <90 mg/dL	PREVENT-ASCVD ≥10% • If TG ≥150 mg/dL to 499 mg/dL, apoB goal: <70 mg/dL	N/A
<b>Severe hypercholesterolemia</b>	<b>Without</b> FH, ASCVD risk factors, and subclinical atherosclerosis	<b>With</b> FH, ASCVD risk factors, or subclinical atherosclerosis	Severe hypercholesterolemia or HeFH with clinical ASCVD
<b>Diabetes</b>	<b>Without</b> ASCVD risk factors or diabetes-specific risk modifiers • apoB goal: <90 mg/dL	<b>With</b> ASCVD risk factors or diabetes-specific risk factors • apoB goal: <70 mg/dL	N/A
<b>Subclinical atherosclerosis</b>	CAC = 1–99 AU and <75th percentile for age, sex, and race	• CAC ≥100 to 299 AU or ≥75th percentile for age, sex, race • CAC ≥300 to 999 AU ◦ Optional goal: LDL-C <55 mg/dL, non-HDL-C <85 mg/dL and consider apoB goal <55 mg/dL	CAC ≥1000 AU
<b>Hypertriglyceridemia</b>	<50 y old with no additional risk enhancers	• With clinical ASCVD not at very high risk ◦ apoB goal: <70 mg/dL • Age 40–75 y with ≥1 ASCVD risk factor ◦ apoB goal: <70 mg/dL	With clinical ASCVD at very high risk • apoB goal: <55 mg/dL
<b>Clinical ASCVD</b>	N/A	Not at very high risk • Optional goal: LDL-C <55 mg/dL, non-HDL-C <85 mg/dL and consider apoB goal <55 mg/dL	• At very high risk ◦ apoB goal: <55 mg/dL • With CKD



2026 Dyslipidemia

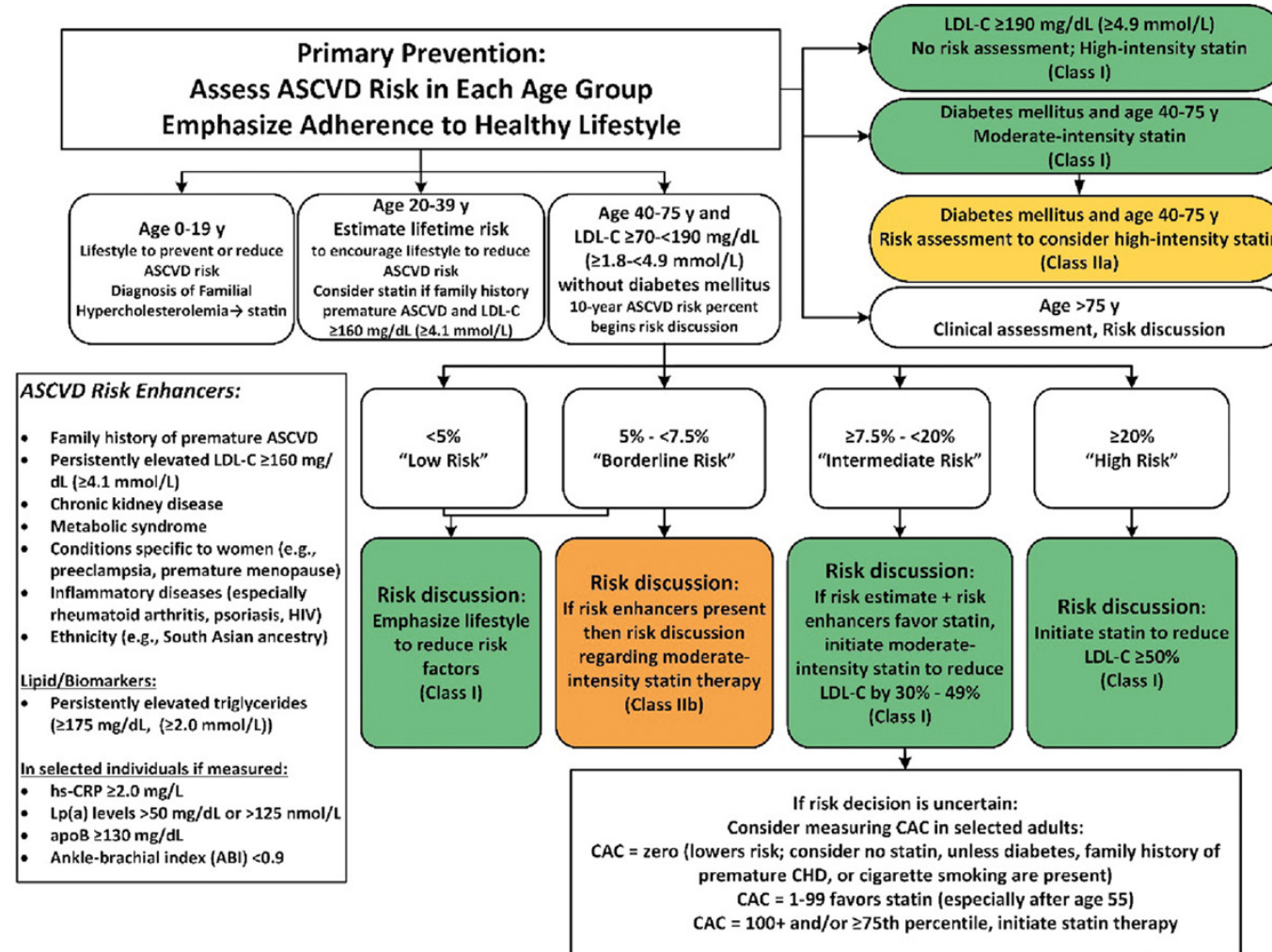
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# When to consider Lipoprotein A (LpA)?



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**Table 4. ASCVD Risk Related to Lp(a) Concentrations\***

Lp(a) concentration nmol/L (mg/dL)	ASCVD Relative Risk: Increase Compared With Population Median (20 nmol/L, 7 mg/dL)
430 nmol/L (180 mg/dL)	4-fold
350 nmol/L (150 mg/dL)	3-fold
250 nmol/L (100 mg/dL)	2 -fold
125 nmol/L (50 mg/dL)	1.4-fold
75–124 nmol/L (30-49 mg/dL)	1.2-fold
<75 nmol/L (<30 mg/dL)	Reference

Data in the table are derived from the UK Biobank Study,<sup>14</sup> are intended as a general guide and may differ in other populations. For example, relative risk of 2-fold has been observed for levels of 200 nmol/L in some populations. Equivalence of levels between nmol/L and mg/dL is approximate. An Lp(a) level of 50 mg/dL (125 nmol/L, ~80th percentile) is associated with an ~40% relative risk increase in ASCVD compared with 7 mg/dL (20 nmol/L, median in a reference population).<sup>1,2</sup> An Lp(a) level of 100 mg/dL ( $\geq 250$  nmol/L, ~95th percentile) approximately doubles the ASCVD risk. An Lp(a) level of 180 mg/dL ( $\geq 430$  nmol/L, ~99th percentile) increases the ASCVD risk by ~4-fold, similar to the risk of heterozygous familial hypercholesterolemia.

\*Lp(a) concentrations in this threshold range may be considered for repeat testing.

ASCVD indicates atherosclerotic cardiovascular disease; and Lp(a), lipoprotein (a).

# When to screen?

Adults (> 20 years of age)

Measurement of Lp(a) is reasonable to refine risk assessment for ASCVD events in:

- Individuals with a family history of 1st degree relatives with premature ASCVD (<55 years of age in men; <65 years of age in women)
- Individuals with premature ASCVD (<55 years of age in men and <65 years of age in women), particularly in the absence of traditional risk factors.
- Individuals with primary severe hypercholesterolemia (LDL 190mg/dL) or suspected familial hypercholesterolemia
- Individuals at very high\*\* ASCVD risk to better define those who are more likely to benefit from PCSK9 inhibitor therapy

# How to approach an elevated LpA

"In the absence of an acute illness, **the level of Lp(a) is stable throughout an individual's lifetime and unaffected by lifestyle. Therefore, a case could be made to measure Lp(a) in all individuals, at least once in a lifetime,** based upon strong support for the association between elevated Lp(a) levels and increased risk, together with genetic findings that indicate elevated Lp(a) is causally related to premature ASCVD and VAS.

However, there is no current evidence to substantiate the benefit of such an approach, and **there is currently no targeted treatment(s) to lower Lp(a) levels that have been proven to affect ASCVD outcomes or progression of VAS.** Therefore, although some panel members supported it, a recommendation for universal testing of Lp(a) was not made at this time.

The Scientific Statement Committee acknowledges that there is likely little harm from a universal screening approach and that the cost of the test is relatively inexpensive compared to other cardiovascular disease screening tests. **As more data become available in the future, the potential role of universal testing should be re-evaluated."**

17

# Available therapies

Existing Lp(a) Lowering Strategies	Lp(a) Reduction
PCSK9i	25–30%
Inclisiran	20-26%
Niacin	20%
Lomitapide	3%
Estrogens	10-15%
LDL Apheresis	30-35%
Lp(a) Lowering Strategies Under Development	
Pelacarsen	80%
Olpasiran	90%
SLN 360	To be determined

Table 7: Current Treatments for Lp(a)

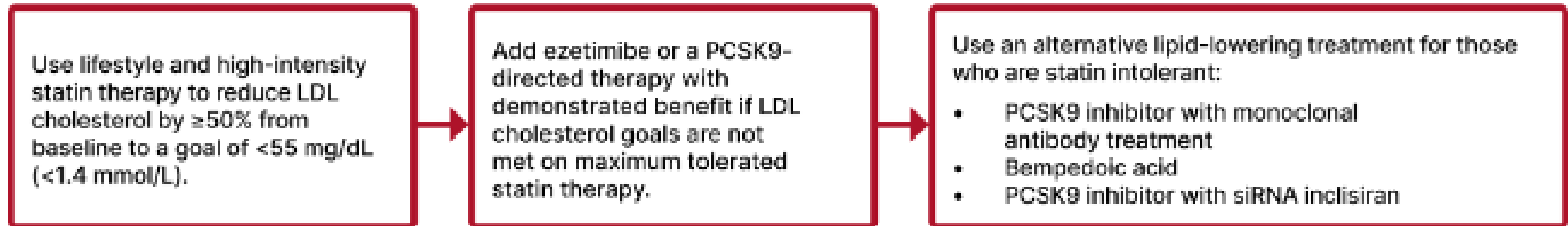
# Categories of high risk and very high risk

\*High-risk patients: clinical ASCVD including myocardial infarction, acute coronary syndrome, stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack, or peripheral artery disease, including aortic aneurysm, all of atherosclerotic origin.

\*\*Very-high-risk patients: history of multiple major ASCVD events or 1 major ASCVD event and multiple high-risk conditions.

# Secondary Prevention

## Lipid Management for Secondary Prevention of Atherosclerotic Cardiovascular Disease Events in People With Diabetes



# Treatment for secondary prevention



In adults aged 40–75 y with a 10-y ASCVD risk of 7.5 %–19.9 %, the finding of an Lp(a)  $\geq 125$  nmol/L or  $\geq 50$  mg/dL is reasonable to be used as a risk-enhancing factor to favor initiation of a moderate- or high-intensity statin in those with on-treatment LDL-C  $\geq 70$  mg/dL (or non-HDL-C  $\geq 100$  mg/dL)<sup>18</sup>



In high-risk or very-high-risk patients with Lp(a)  $\geq 125$  nmol/L or  $\geq 50$  mg/dL, it is reasonable to consider more intensive LDL-C lowering to achieve greater ASCVD risk reduction



In high-risk or very-high-risk patients taking a maximally tolerated statin, with Lp(a)  $\geq 125$  nmol/L or  $\geq 50$  mg/dL, the addition of ezetimibe is reasonable in those with on-treatment LDL-C  $\geq 70$  mg/dL (or non-HDL-C  $\geq 100$  mg/dL)<sup>18</sup>



In high-risk or very-high-risk - patients taking a maximally tolerated statin, with Lp(a)  $\geq 125$  nmol/L or  $\geq 50$  mg/dL, the addition of a PCSK9 inhibitor is reasonable in those with on-treatment LDL-C  $\geq 70$  mg/dL (or non-HDL-C  $\geq 100$  mg/dL)<sup>18</sup>



Lipoprotein apheresis is reasonable for high-risk patients with FH and ASCVD (coronary or peripheral arteries) whose Lp(a) level remains  $\geq 60$  mg/dL ( $\sim 150$  nmol/L) and LDL-C  $\geq 100$  mg/dL on maximally tolerated lipid-lowering therapy<sup>18</sup>



Niacin or HRT with estrogen and progesterone, which lower Lp(a) concentration, is not recommended to reduce ASCVD risk<sup>18</sup>

## Table 5: Summary of low-density lipoprotein-cholesterol lowering medications

Drug class	Mechanism of action	Clinical efficacy	Adverse reactions
Statins	Inhibition of HMG coenzyme A Reductase	Highly effective	Myalgia, myositis, rhabdomyolysis, elevation in liver enzymes, new onset diabetes
Ezetimibe	Decrease intestinal cholesterol absorption by binding to Niemann-Pick C1-like 1 protein	Moderately effective; Safe addition to statin therapy	Worsening of liver function, myopathy or rhabdomyolysis if added to statins; Nasopharyngitis, diarrhea, upper respiratory tract infection
PCSK9 inhibitors	Inhibition of Proprotein Convertase Subtilisin/Kexin Type 9	Very highly effective in combination with statin therapy	Injection site reaction including itching, swelling, erythema and pain
Bile acid sequestrants	Bind bile acids in the small intestine and prevent reabsorption	Moderately effective, safe addition to statin therapy, not desirable if triglycerides are > 300 mg/dL	Constipation, abdominal pain, bloating, drug malabsorption

HMG: Hydroxymethylglutaryl; PCSK9: Proprotein convertase subtilisin/kexin type 9.

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# Questions?

# Thank You

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