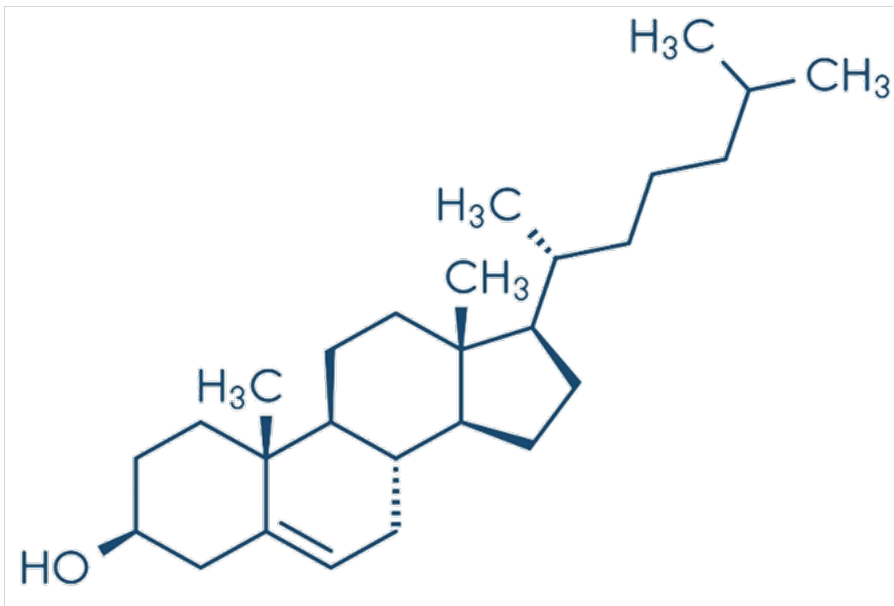


Management of Blood Cholesterol

Cholesterol



- ✓ Waxy
- ✓ Fat like substance
- ✓ Found in every cell

Roles of Cholesterol

- Forms and maintains cell membrane structure
- To produce bile
- For making hormones like :
 - I. Cortisol,
 - II. Testosterone,
 - III. Progesterone and
 - IV. Estrogen.
- To produce vitamin D
- For nerve cells insulation

Normal Lipid profile according to European guideline

Cholesterol Name	Level
Total Cholesterol	≤ 180 mg/dl
LPL Cholesterol	≤ 115 mg/dl
HDL Cholesterol	≥ 40 mg/dl
Triglyceride	≤ 180 mg/dl

If cholesterol level increases above this normal parameter

Consequences are

Hyperlipidemia is high levels of fat in the blood, such as cholesterol and triglycerides.

Hypertriglyceridemia, a condition in which triglyceride levels are elevated.

Primary dysbetalipoproteinemia or type III hyperlipoproteinemia is a condition characterized by increased total cholesterol and triglyceride levels, and decreased HDL levels.

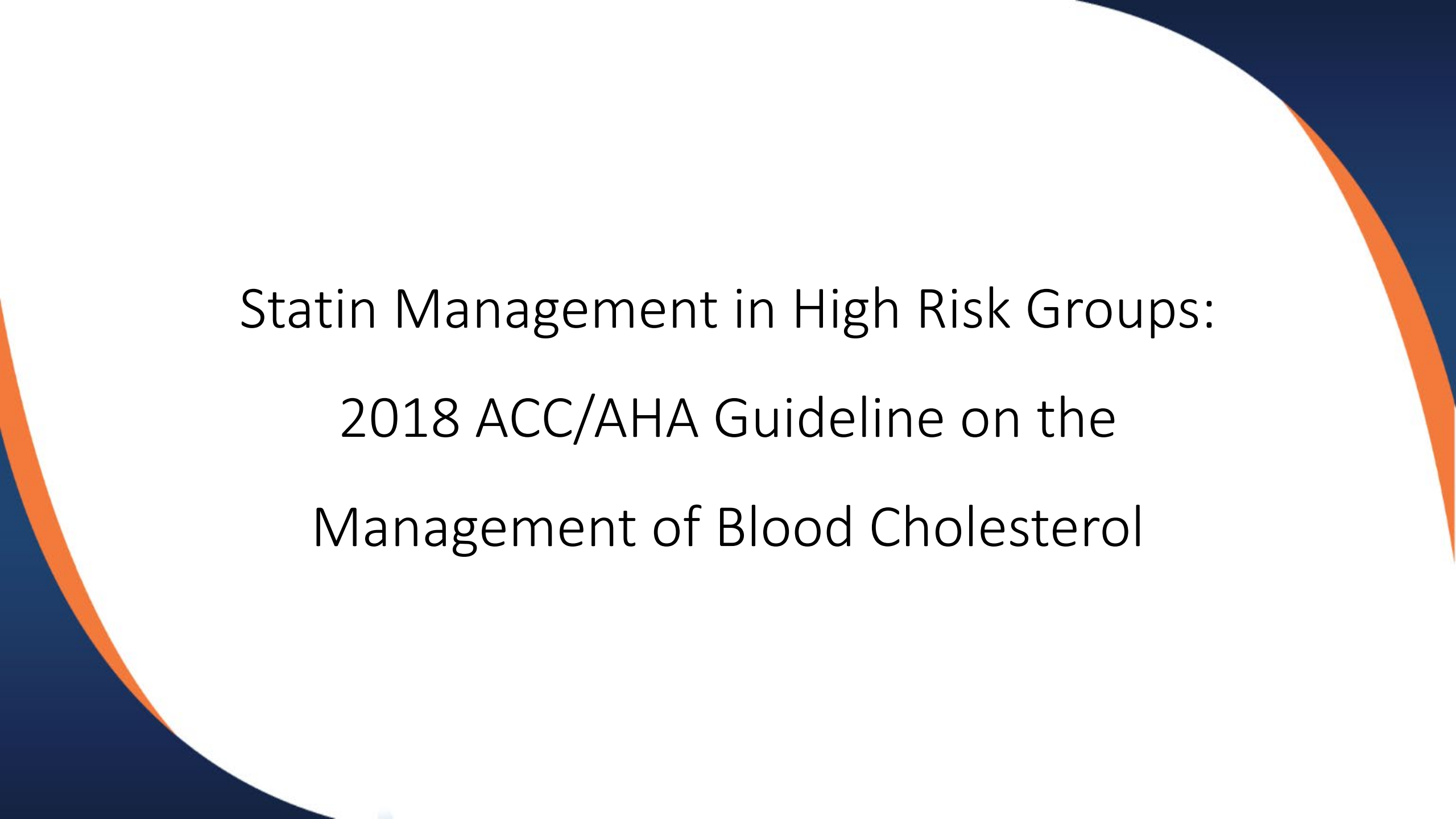
Major consequence of High Blood lipid is

Atherosclerosis



Treatment option for Hyperlipidemia

- Statins
- Niacin
- Fibrates
- Bile acid sequestrants
- Cholesterol absorption inhibitor
- Omega-3 Fatty acid



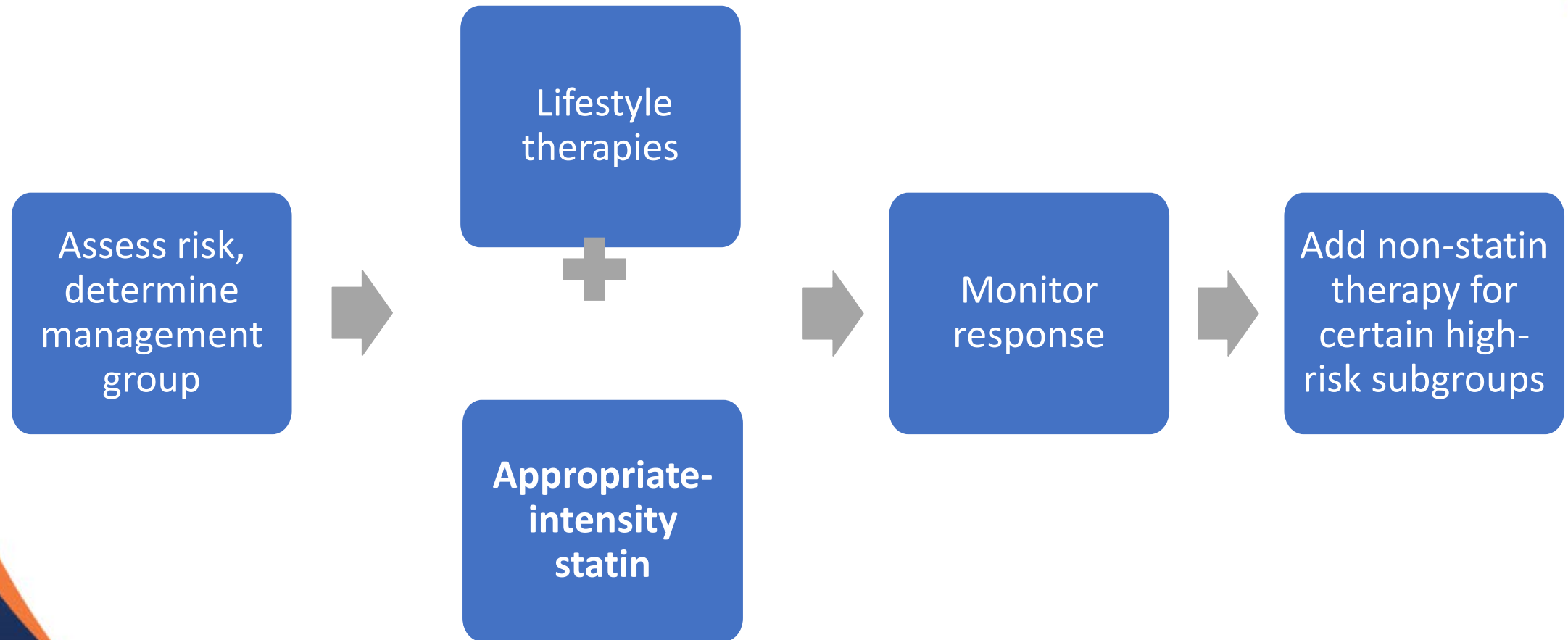
Statin Management in High Risk Groups:
2018 ACC/AHA Guideline on the
Management of Blood Cholesterol



Purpose

- Outline highlights from the 2018 ACC/AHA Guideline on the management of Blood Cholesterol
- Review statin management in high risk patients

ACC/AHA 2018: Overall Approach



Four Statin Management Groups



Grundy SM, et al. 2018 AHA/ACC Cholesterol Guideline. *Circulation*. 2019;139:e1082–e1143.

High and Moderate-Intensity Statin Therapy

High-intensity

Lowers LDL-C on average $\geq 50\%$

Atorvastatin 40–80 mg*
Rosuvastatin 20–40 mg*

*Administer any time of day

Moderate-intensity

Lowers LDL-C on average 30 to 49%

Atorvastatin 10–20 mg*
Rosuvastatin 5–10 mg*
Simvastatin 20–40 mg
Pravastatin 40–80 mg
Lovastatin 40–80 mg
Fluvastatin XL 80 mg*
Fluvastatin 40 mg bid
Pitavastatin 1–4 mg*

ACC/AHA: Clinical ASCVD

Clinical ASCVD

- **Age ≤ 75 :** High-intensity statin [I: A]
- **Age > 75 :** Moderate-to-high-intensity statin, after considering: [IIa; B]
 - ASCVD risk
 - Potential adverse events
 - Drug-drug interactions
 - Frailty
 - Patient preferences
- **Heart Failure due to ischemic CVD, life expectancy $3+$ yrs:** Consider moderate-intensity statin [IIb; B-R]

Grundy SM, et al. 2018 AHA/ACC Cholesterol Guideline. *Circulation*. 2019;139:e1082–e1143.

ACC/AHA: LDL-C ≥ 190

Age 20-75
LDL-C ≥ 190

- **Age 20–75:** high-intensity or max tolerated statin [I;B-R]
- <50% LDL-C reduction or LDL ≥ 100 on max tolerated statin: adding ezetimibe reasonable [IIa;B-R]
- Age 30 to 75, heterozygous FH, LDL-C ≥ 100 on max tolerated statin + ezetimibe: Adding PCSK9 inhibitor may be considered [IIb;B-R]

Grundy SM, et al. 2018 AHA/ACC Cholesterol Guideline. *Circulation*. 2019;139:e1082–e1143.

ACC/AHA: Primary Prevention in Diabetes

Primary Prevention
Diabetes
LDL-C 70 – 189

- **Age 40-75:** Moderate-intensity statin irrespective of 10-year ASCVD risk [I; A]
- **Age 40-75 with multiple ASCVD risk factors:** High-intensity statin is reasonable [IIa; B]
- **Age ≥75 on statin:** Reasonable to continue statin [IIa; B]
- **Age ≥75 not on statin:** Consider starting after risk / benefit discussion [IIb; C]
- **Age 20-39:** Consider starting statin if long duration of DM or microvascular disease or ABI <0.9 [IIb; C]

Grundy SM, et al. 2018 AHA/ACC Cholesterol Guideline. *Circulation*. 2019;139:e1082–e1143.

A Note on Interactions

Interacting Medication	Statin	Effect
Amiodarone	Lova, Simva	Increased statin exposure
Amlodipine	Lova, Simva	Increased statin exposure
Colchicine	All (espec. Atorva, Simva)	Increased statin exposure
Cyclosporine/tacrolimus	Lova, Pitava, Simva, others	Increased statin exposure
Digoxin	Atorva	Increased digoxin levels
Diltiazem	Atorva, Lova, Simva	Increased statin exposure
Gemfibrozil	All	Increased statin exposure
Ticagrelor	Atorva, Lova, Simva	Increased statin exposure
Verapamil	Lova, Simva	Increased statin exposure
Warfarin	Fluva, Lova, Rosuva, Simva	Increased INR

Key: Use recommended despite interaction, Consider use, Avoid

Recommendations for Management of Clinically Significant Drug-Drug Interactions With Statins and Select Agents Used in Patients With Cardiovascular Disease: A Scientific Statement From the American Heart Association. *Circulation*. 2016;134:e468-e495.



Follow-Up Monitoring after Initiating Statins

- Lipid panel 4 – 12 weeks after statin initiation to check adherence
- Then every 3 – 12 months, as clinically indicated
- Responses are defined by % reductions in LDL-C from baseline
- In ASCVD patients at very high risk, LDL-C ≥ 70 trigger consideration on adding non-statin to maximal statin therapy
- Inadequate response should trigger discussion of medication adherence
- Don't need to routinely monitor transaminases

Grundy SM, et al. 2018 AHA/ACC Cholesterol Guideline. *Circulation*. 2019;139:e1082–e1143.

How do I remember all of this?

- Take advantage of the ACC's LDL-C Manager (<http://tools.acc.org/ldl>)
 - Determine management group and initial treatment
 - Determine if your patient has responded appropriately to a statin
 - Available as an app
- JACC guideline summary:
http://www.onlinejacc.org/sites/default/files/additional_assets/guidelines/2018_Cholesterol_Guidelines_Made_Simple_Tool.pdf#page=7



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Thank You