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Hyperlipidemia (Part 3 and Discussion)

Learning Objectives

- The student will be able to *explain* the current guidelines for the management of blood cholesterol
- The student will be able to *assess* the benefits of non-pharmacologic and pharmacologic therapy for different patient populations.

Learning Objectives

- Given a patient case, the student will be able to *design* an appropriate treatment plan, including goals of therapy and integration of drug and non-drug therapy, for hyperlipidemia based on CHD risk and concurrent disease states.

2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA

Guideline on the Management of Blood Cholesterol: Executive Summary

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Citation

This slide set is adapted from the 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: Executive Summary.

The full-text guidelines are also available on the following Web sites: ACC (www.acc.org) and AHA (professional.heart.org)

ASCVD Risk Estimator: https://tools.acc.org/ascvd-risk-estimator-plus/#!/calculate/estimate/

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Abbreviations

(page 11)

- Clinical atherosclerotic cardiovascular disease (ASCVD) includes acute coronary syndrome (ACS), those with history of myocardial infarction (MI), stable or unstable angina or coronary or other arterial revascularization, stroke, transient ischemic attack (TIA), or peripheral artery disease (PAD) including aortic aneurysm, all of atherosclerotic origin.
- ASCVD indicates atherosclerotic cardiovascular disease;
- CHD, coronary heart disease;
- CVD, cardiovascular disease;
- ERC, Evidence Review Committee;
- LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction; NNH, number needed to harm; NNT number needed to treat; and RCT, randomized controlled trial.

High Blood Cholesterol and ASCVD

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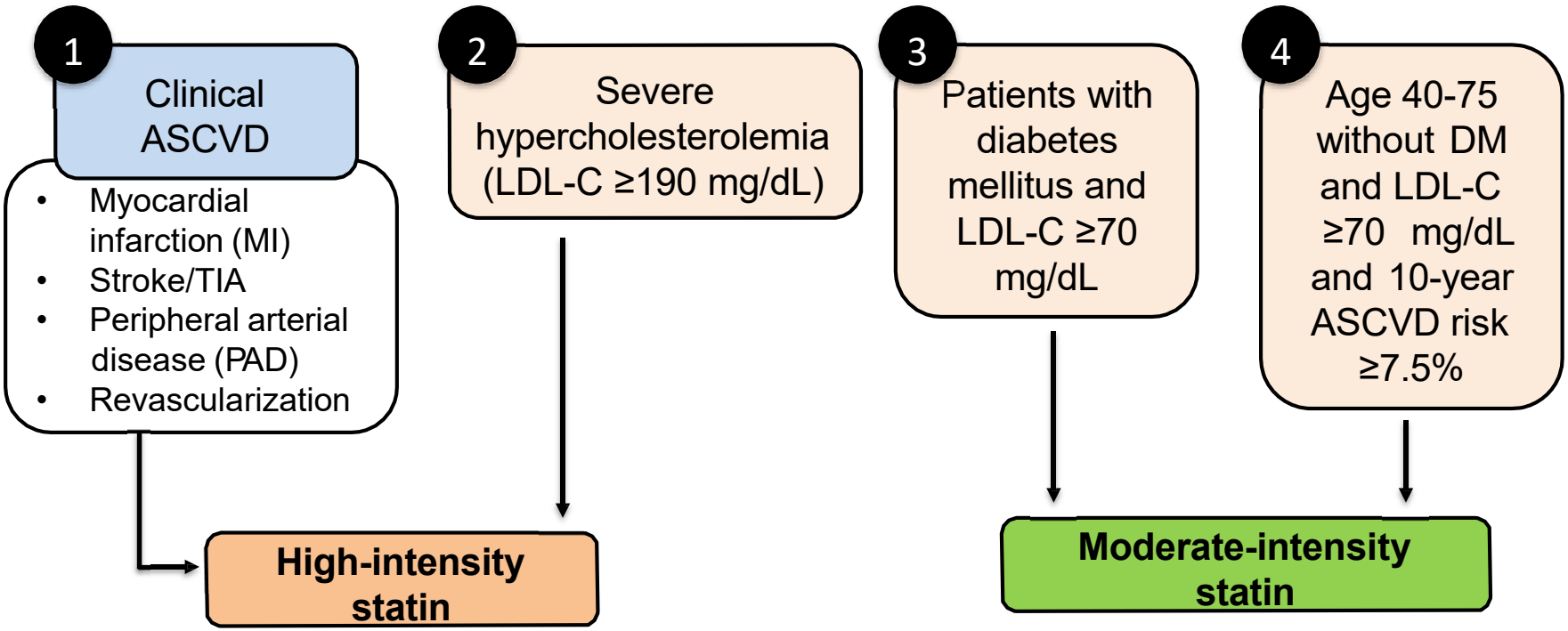
2018 ACC/AHA Blood Cholesterol

- Lifestyle Therapies
  - Heart healthy diet
  - Physical activity
- Four (4) Statin Benefit Groups
  - Moderate- or high-intensity statins

Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

2018 ACC/AHA Blood Cholesterol



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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2018 ACC/AHA Blood Cholesterol

- Monitoring
  - Adherence to lifestyle and LDL-C lowering therapies
  - 4 to12 weeks after statin initiation or dose adjustment
  - 3 to 12 months thereafter

Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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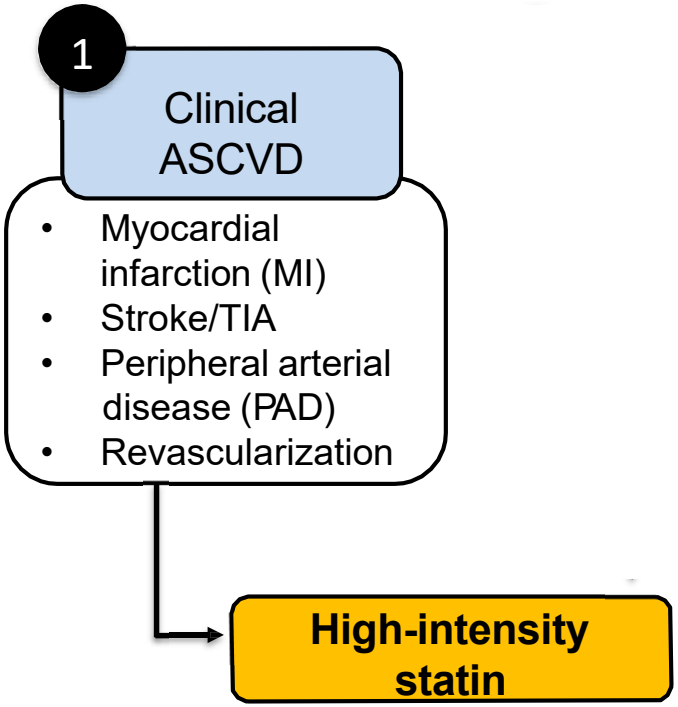
Case 1:

What changes would you make to HB's lipid therapy?

- HB is a 67-year-old African American male here for diabetes management
- PMH: T2DM, HTN, previous MI (2016)
- Meds:
  - lisinopril 40 mg/d
  - carvedilol 12.5 mg BID
  - aspirin 81 mg/d
  - metformin 1000 mg BID
  - empagliflozin 10 mg/d
  - rosuvastatin 40 mg/d
- Vitals
  - BP= 126/68 mm Hg
  - HR= 67 bpm
  - Weight= 193 lbs.
  - BMI= 27.6 kg/m^2
  - FBG= 113 mg/dL

Lipid panel	
Total Chol.	171 mg/dL
TG	133 mg/dL
HDL-C	42 mg/dL
LDL-C	84 mg/dL

2018 ACC/AHA Blood Cholesterol



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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2018 ACC/AHA: Secondary Prevention

- "Very-high risk" group

Very-high risk includes: ≥2 major ASCVD events **or** major ASCVD event + multiple high-risk conditions	
Major ASCVD events	**High-risk Conditions**
• ACS within previous 12 months • Previous MI or ischemic stroke • Symptomatic PAD, previous peripheral revascularization/amputation, or claudication with ABI <0.85	• Prior revascularization (CABG; PCI) outside of ASCVD event • **Diabetes mellitus** • **Hypertension** • Current smoking • eGFR 15-59 ml/min/1.73m^2 • LDL-C ≥100 mg/dL (despite maximally tolerated statin + ezetimibe) • **Age ≥65 years** • Heterozygous Familial Hypercholesterolemia • Congestive heart failure

Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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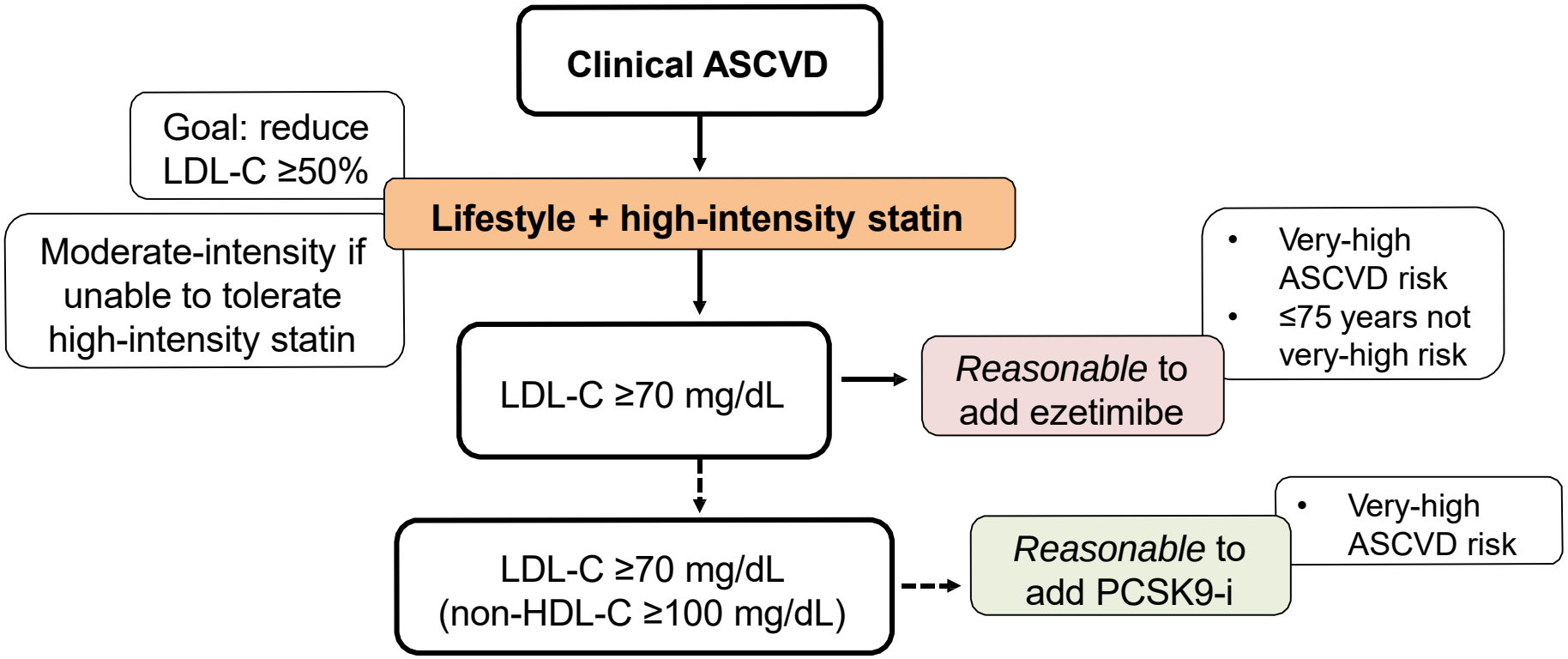
2018 ACC/AHA: Secondary Prevention



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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Non-statins for Secondary Prevention

Ezetimibe

- ↓ LDL-C 20-25%
- Once-daily oral pill
- Generic available

PCSK9-inhibitors

- ↓ LDL-C 45-65%
- Bi-weekly SQ injection
- Brand only
  - ~$14,000/yr (2018)
  - ~$6,000/yr (2019)

Case 1:

What changes would you make to HB's lipid therapy?

Reasonable to add ezetimibe 10 mg daily to current therapy

- HB is a 67-year-old African American male h
  management
- PMH: T2DM, HTN, previous MI (2016)
- Meds:
  - lisinopril 40 mg/d
  - carvedilol 12.5 mg BID
  - aspirin 81 mg/d
  - metformin 1000 mg BID
  - empagliflozin 10 mg/d
  - rosuvastatin 40 mg/d
- Vitals
  - BP= 126/68 mm Hg
  - HR= 67 bpm
  - Weight= 193 lbs.
  - BMI= 27.6 kg/m^2
  - FBG= 113 mg/dL

Tot… Cho…	171 mg/dL
TG	133 mg/dL
HDL-C	42 mg/dL
LDL-C	84 mg/dL

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ADA 2019: Lipids

- Lifestyle modifications (diet & physical activity) should be recommended to improve the lipid profile and **reduce the risk of ASCVD** in patients with diabetes (A)

Diabetes Care 2019;42(Suppl. 1):S103–S123

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ADA 2019: Reducing ASCVD Risk

Age	ASCVD or 10-year ASCVD risk >20%	Recommended treatment
<40 years	Yes	High-intensity statin*
	No	None^
≥40 years	Yes	High-intensity statin*
	No	Moderate-intensity statin^
Maximally tolerated statin dose if unable to tolerate recommended intensity		

^moderate-/high-intensity may be considered if **additional ASCVD risk factors** present**:** (LDL-C ≥100 mg/dL; high blood pressure, smoking, family history of premature ASCVD, CKD, or albuminuria).
*If LDL-C ≥70 mg/dL on max-tolerated statin, consider additional LDL-C lowering therapy (ezetimibe/PCSK9-I)

Diabetes Care 2019;42(Suppl. 1):S103–S123

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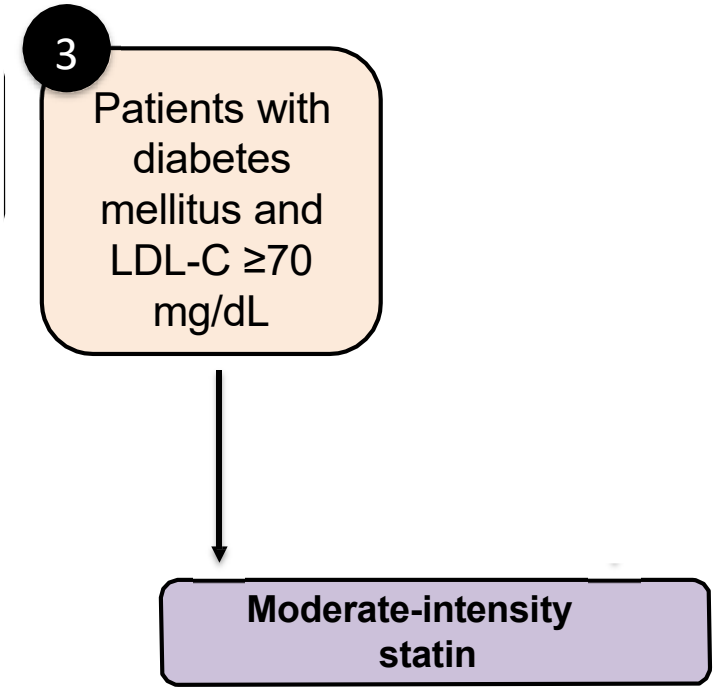
2018 ACC/AHA Blood Cholesterol



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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Primary Prevention in Patients with Diabetes Mellitus (DM)

- Recommendations for adult patients with diabetes mellitus and LDL-C 70-189 mg/dL
  - 20-39 years
  - 40-75 years
  - >75 years

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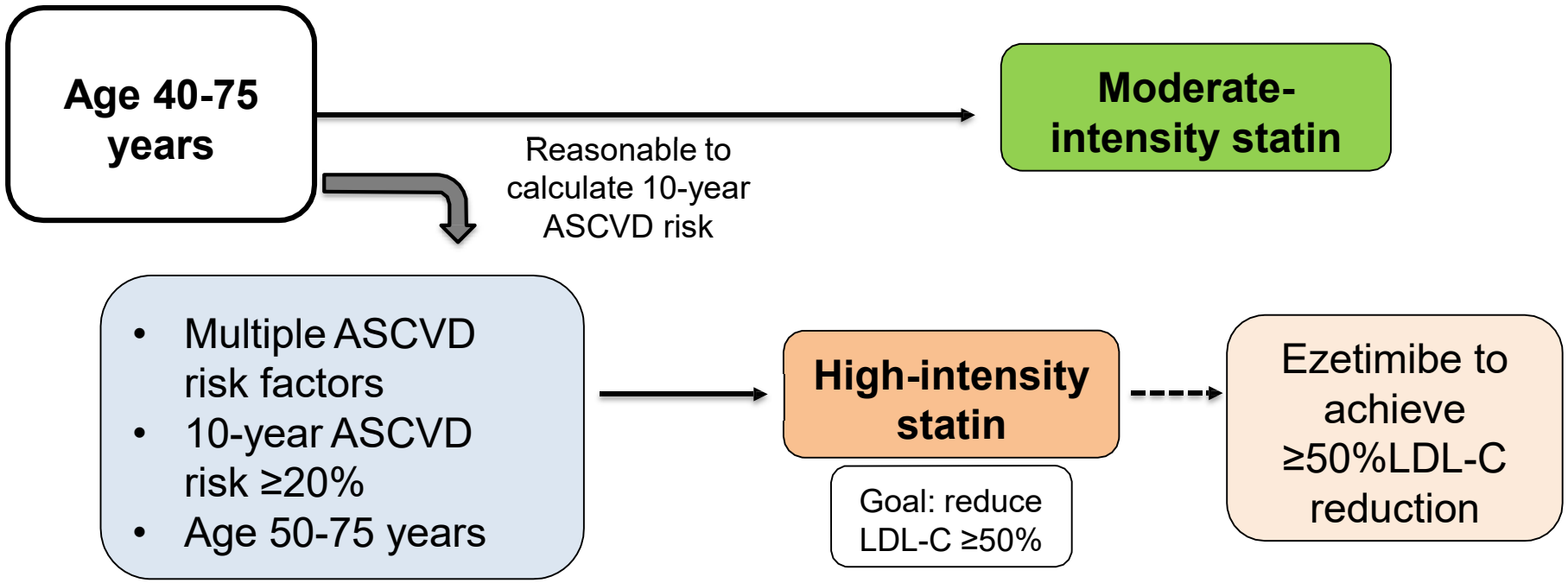
Primary Prevention in Patients with DM



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ADA 2019: Reducing ASCVD Risk

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<40 years	Yes	High-intensity statin*
	No	None^
≥40 years	Yes	High-intensity statin*
	No	Moderate-intensity statin^
Maximally tolerated statin dose if unable to tolerate recommended intensity		

^moderate-/high-intensity may be considered if **additional ASCVD risk factors** present**:** (LDL-C ≥100 mg/dL; high blood pressure, smoking, family history of premature ASCVD, CKD, or albuminuria).
*If LDL-C ≥70 mg/dL on max-tolerated statin, consider additional LDL-C lowering therapy (ezetimibe/PCSK9-I)

Diabetes Care 2019;42(Suppl. 1):S103–S123

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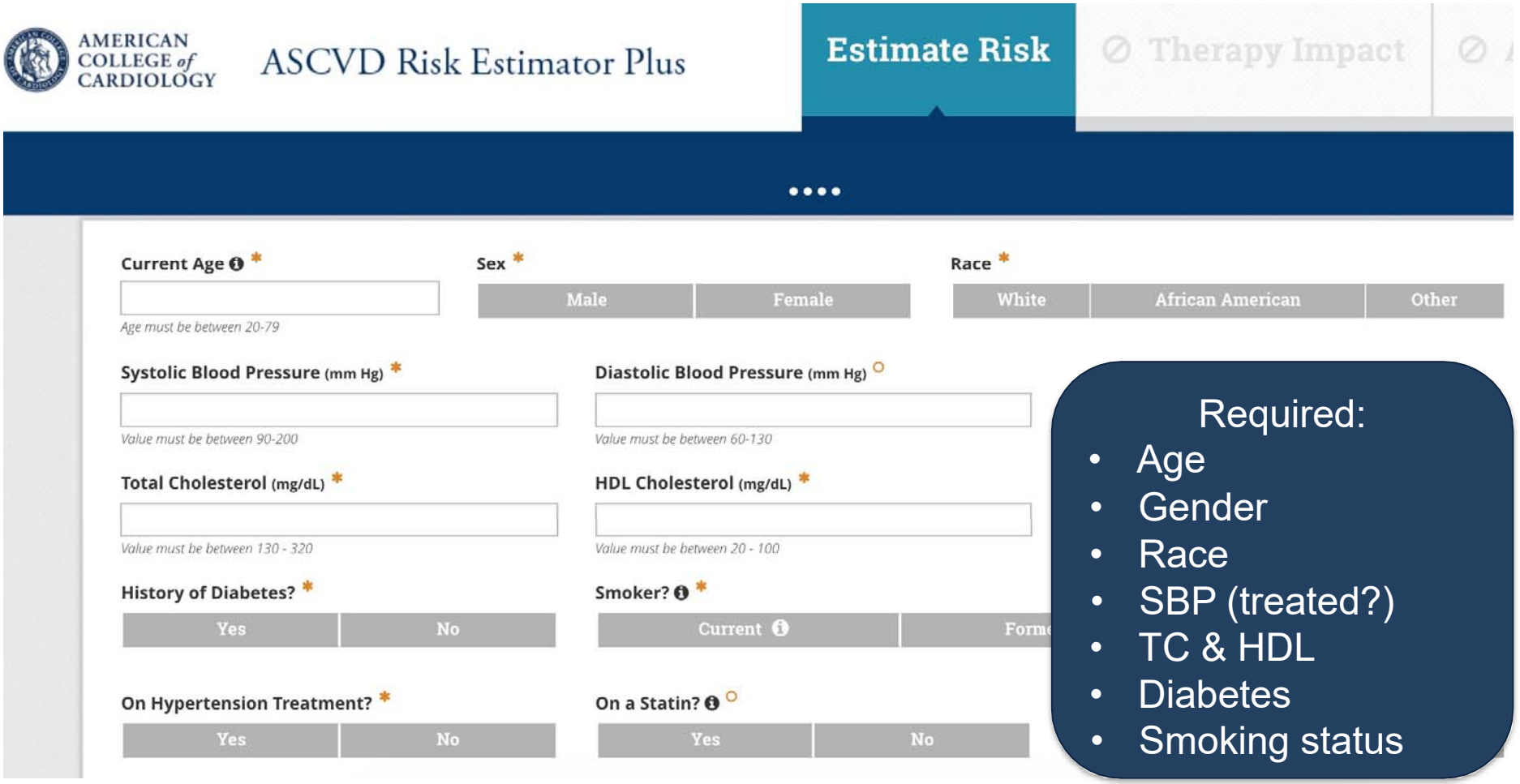

Required:

- Age
- Gender
- Race
- SBP (treated?)
- TC & HDL
- Diabetes
- Smoking status

http://tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/calculate/estimate/

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10-year ASCVD Risk Calculator

- 57 y/o AAF with diabetes
  - BP =138/78 mmHg (treated)
  - TC=234 mg/dL; HDL-C=48 mg/dL
- 51 y/o Hispanic male with diabetes and current smoking
  - BP =126/68 mmHg (treated)
  - TC=208 mg/dL; HDL-C=44 mg/dL
- 61 y/o non-Hispanic male with diabetes
  - BP =144/90 mmHg (untreated)
  - TC=185 mg/dL; HDL-C=46 mg/dL

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Case 2:

Is lipid-lowering medication recommended for GN?

- GN is a 63-year-old non-Hispanic female here for initial visit.
- PMH: T2DM, HTN, CKD
- SH: Smokes 8-12 cig/d
- Meds:
  - amlodipine 5 mg/d
  - losartan 100 mg/d
  - metformin 1000 mg BID
- Vitals
  - BP= 132/78 mm Hg
  - HR= 82 bpm
  - BMI= 28.6 kg/m^2

10-year ASCVD risk = 24.3%			
Labs			
eGFR	56 ml/min/1.73m^2	Total Chol.	194 mg/dL
UACR	69 mcg/mg	TG	156 mg/dL
FBG	124 mg/dL	HDL-C	44 mg/dL
HgbA1C	7.2%	LDL-C	116 mg/dL

Case 2:

Is lipid-lowering medication recommended for GN?

High-intensity statin

- GN is a 63-year-old non-Hispanic female here for initial visit.
- PMH: T2DM, HTN, CKD
- SH: Smokes 8-12 cig/d
- Meds:
  - amlodipine 5 mg/d
  - losartan 100 mg/d
  - metformin 1000 mg BID
- Vitals
  - BP= 132/78 mm Hg
  - HR= 82 bpm
  - BMI= 28.6 kg/m^2

10-year ASCVD risk = 24.3%			
Labs			
eGFR	56 ml/min/1.73m^2	Total Chol.	194 mg/dL
UACR	69 mcg/mg	TG	156 mg/dL
FBG	124 mg/dL	HDL-C	44 mg/dL
HgbA1C	7.2%	LDL-C	116 mg/dL

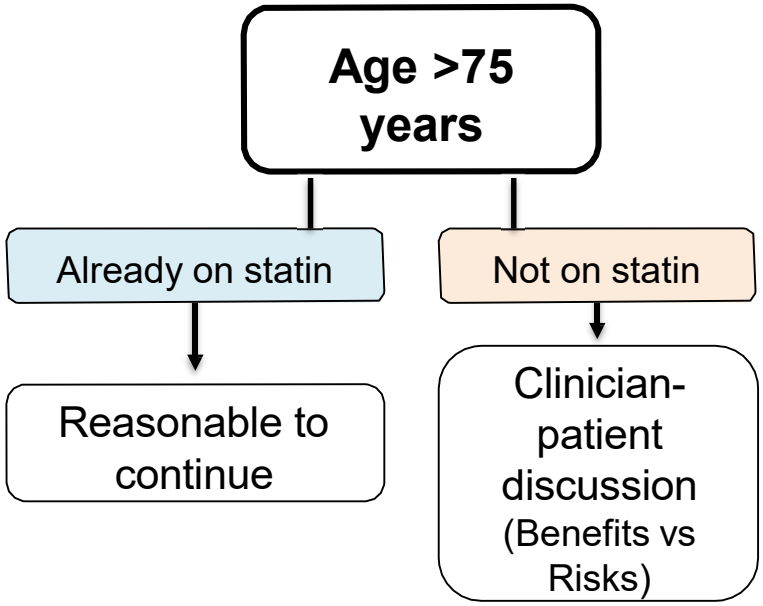
Primary Prevention in Patients with DM

Age 20-39 years

Assess Diabetes-Specific Risk Enhancers

- Long duration of DM
  - ≥20 years T1DM
  - ≥10 years T2DM
- Retinopathy
- Neuropathy
- Albuminuria ≥30 mcg of albumin/mg creatinine
- eGFR <60 mL/min/1.73 m^2
- ABI <0.9

Moderate Intensity Statin



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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Case 3:

Is lipid-lowering medication recommended for HL?

- HL is a 48-year-old African American male here for pre-diabetes education
- PMH: HTN, pre-diabetes
- Meds: amlodipine 5 mg/d
- Vitals
  - BP= 137/74 mm Hg
  - HR= 72 bpm
  - BMI= 33.8 kg/m^2
  - Waist circumference= 42.3”

Labs			
eGFR	115 ml/min/1.73m^2	Total Chol.	214 mg/dL
UACR	3 mcg/mg	TG	234 mg/dL
FBG	118 mg/dL	HDL-C	36 mg/dL
HgbA1C	6.4%	LDL-C	113 mg/dL

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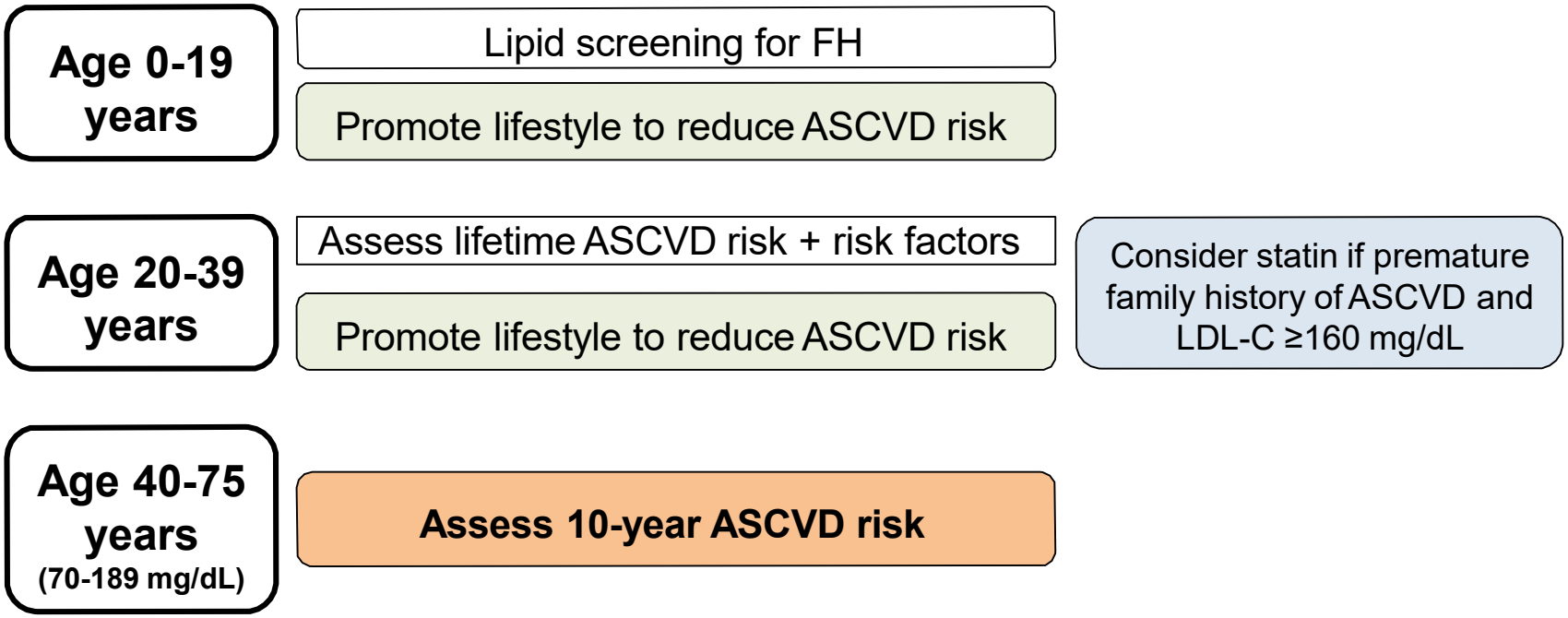
Primary Prevention in Patients without DM



Grundy SM, et al. 2018 ACC/AHA Guideline on the Management of Blood Cholesterol

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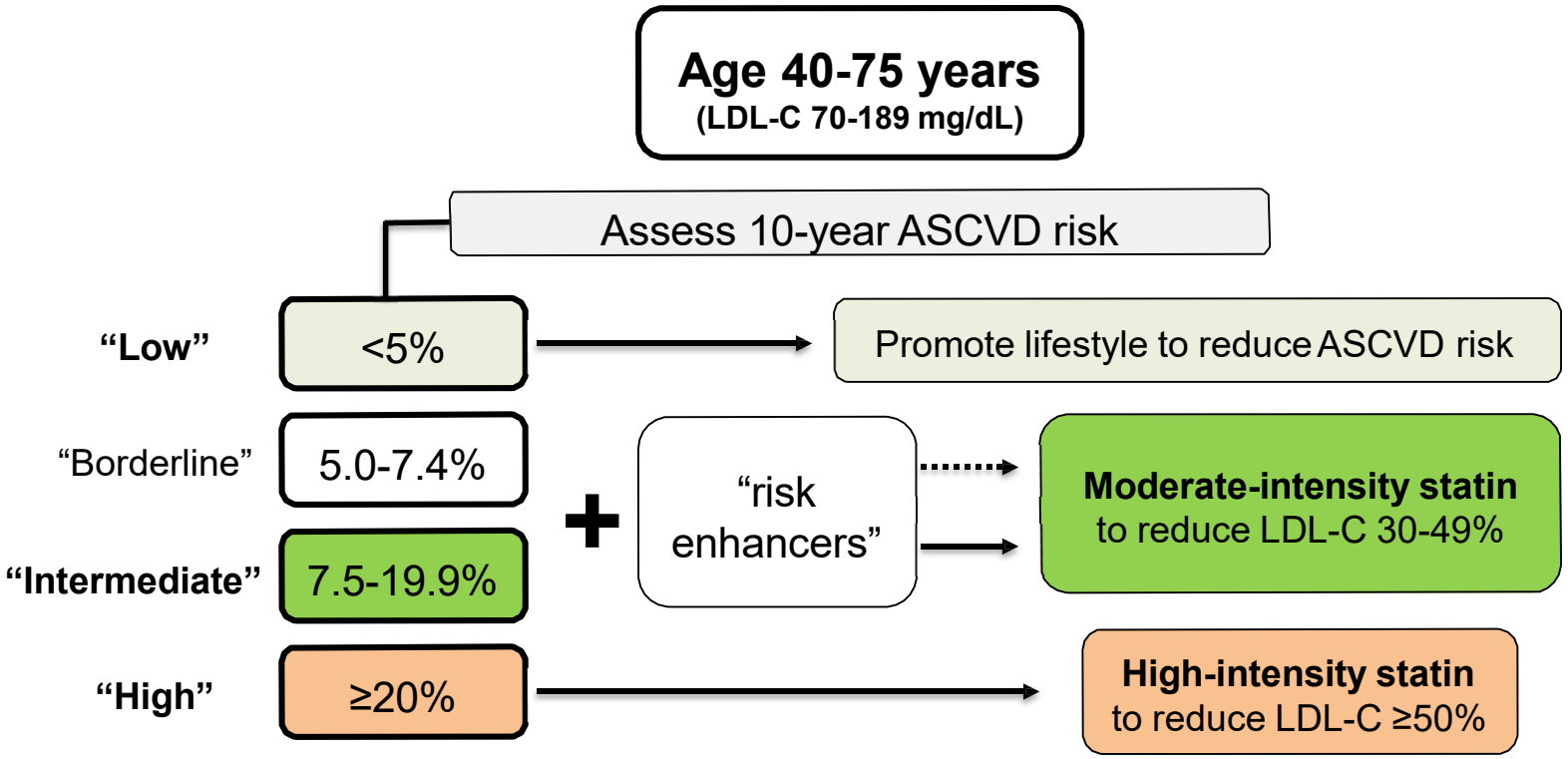
Primary Prevention in Patients without Diabetes



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Risk Enhancing Factors

Family history of premature ASCVD Chronic kidney disease	**Lipid/biomarkers**
Metabolic syndrome	Persistently elevated LDL-C (≥160 mg/dL)
Ethnicity (South Asian)	Persistently elevated TG (≥175 mg/dL)
Inflammatory diseases (RA,HIV, psoriasis)	hs-CRP ≥2.0 mg/L
Preeclampsia & premature menopause	Lp(a) ≥50 mg/dL or >125 nmol/L
Ankle-brachial index <0.9	apoB ≥130 mg/dL
*to guide decision to initiate statin therapy in "borderline" and "**intermediate-risk**" individuals age 40-75 with LDL-C ≥70 mg/dL	

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Case 3:

Is lipid-lowering medication recommended for HL?

Intermediate-risk + MetS

to reduce LDL-C 30-49%

- HL is a 48-year-o ale here for pre-diabetes education
- PMH: HTN, pre-diabetes
- Meds: amlodipine 5 mg/d
- Vitals
  - BP= 137/74 mm Hg
  - HR= 72 bpm
  - BMI= 33.8 kg/m^2
  - Waist circumference= 42.3”

10-year ASCVD risk = 10.3%

Labs			
eGFR	115 ml/min/1.73m^2	Total Chol.	214 mg/dL
UACR	3 mcg/mg	TG	234 mg/dL
FBG	118 mg/dL	HDL-C	36 mg/dL
HgbA1C	6.4%	LDL-C	113 mg/dL

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Hypertriglyceridemia

- VLDL particles = Increase ASCVD risk
- Persistent TG ≥175 mg/dL is a risk-enhancing factor

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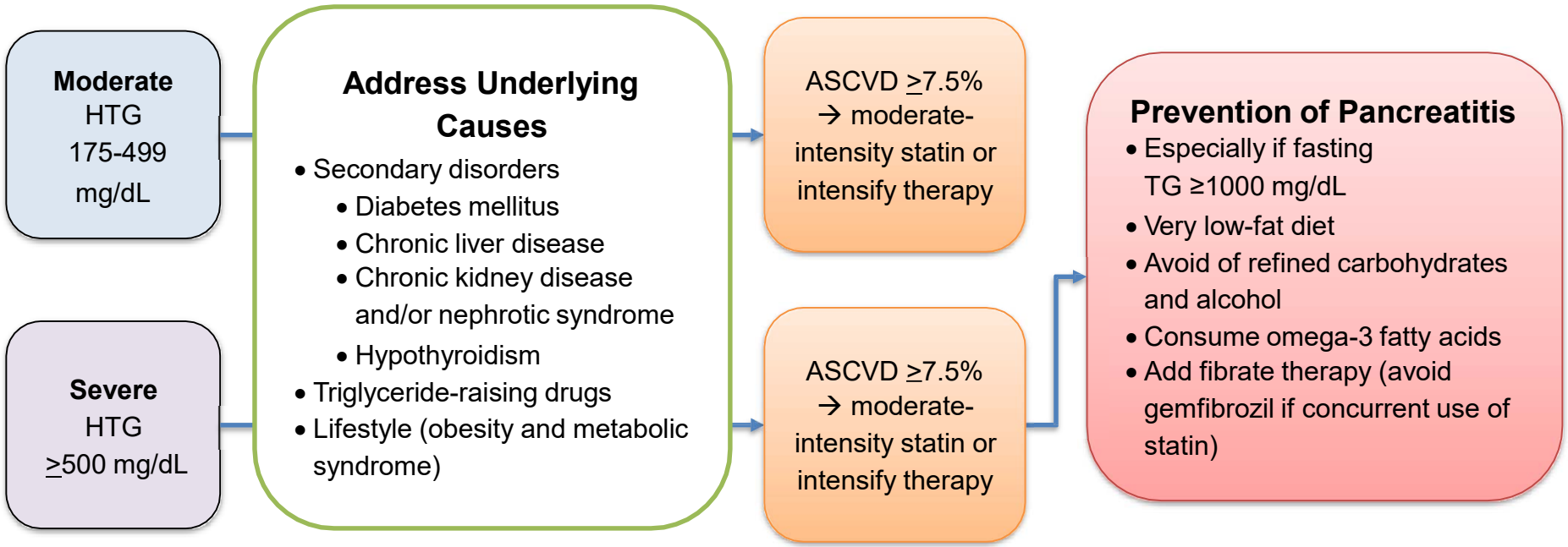
Approach to Hypertriglyceridemia (HTG)



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Case 4:

- AD is a 66-year-old Hispanic female here for follow-up on diabetes and dyslipidemia.
- PMH: T2DM, elevated TG, HTN, prior MI (2015).
- Meds:
  - Benazepril/HCTZ 20/25 mg/d
  - Atorvastatin 80 mg/d
  - Metformin ER 2g/d
  - Canagliflozin 300 mg/d
  - Liraglutide 1.8 mg/d
  - Aspirin 81 mg/d

What changes would you make to AD's lipid lowering meds?

Labs		
	Lipid panel TC/ TG/ HDL-C/ LDL-C	**A1C**
Aug. '20	176/ 213/ 44/ 68	6.9%
May '20	168/ 198/ 42/ 71	7.1%
Jan. '20	182/ 226/ 43/ 75	7.5%

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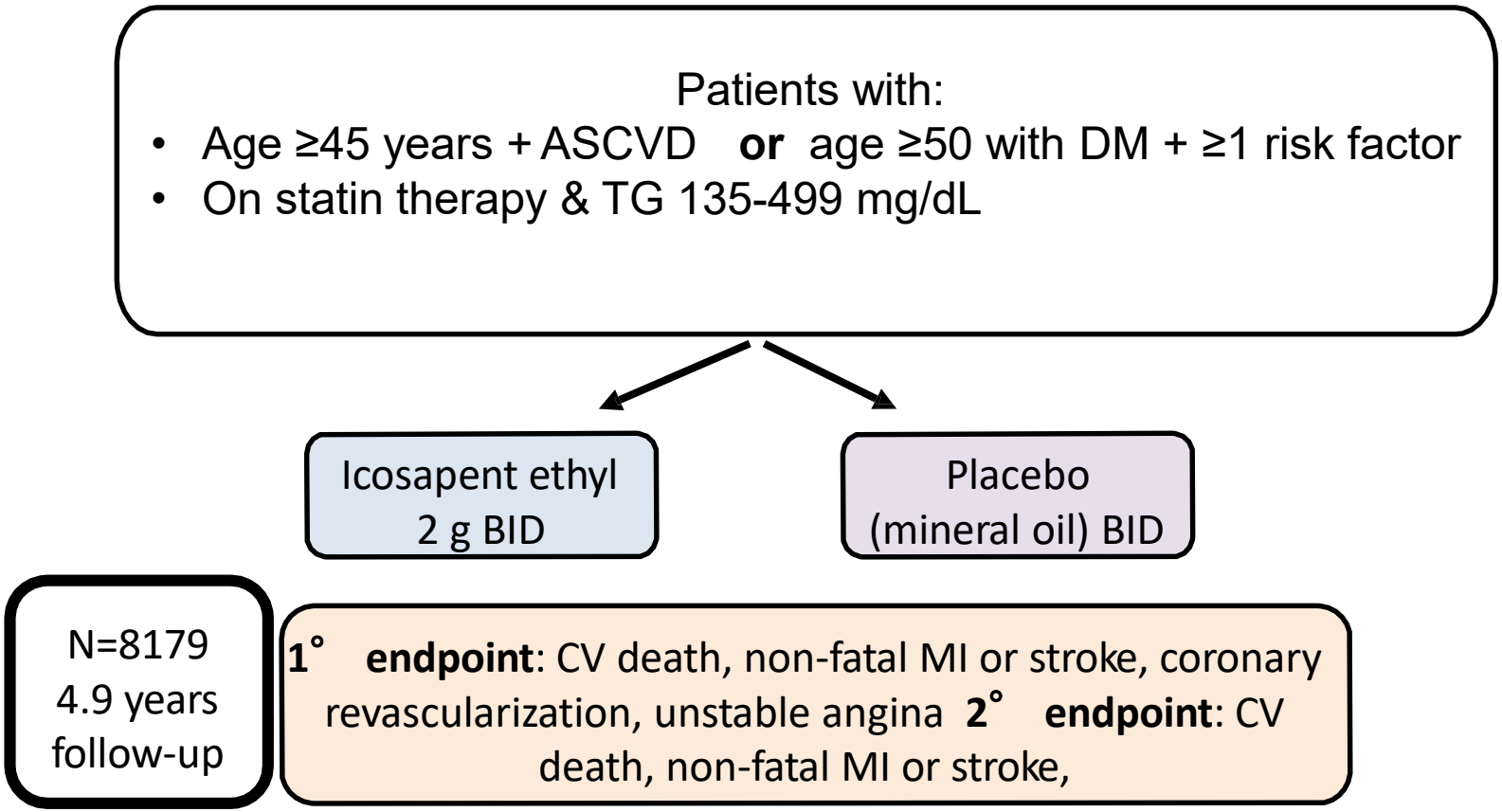
REDUCE-IT



N Engl J Med. 2019 Jan 3;380(1):11-22.

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REDUCE-IT

Outcome	IE (n=4089)	Placebo (n=4090)	Hazard Ratio (95% CI)
1° composite	17.2%	22.0%	**0.75 (0.68-0.83)**
2° composite	11.2%	14.8%	0.74 (0.65-0.83)
CV death or non-fatal MI	9.6%	12.4%	0.75 (0.66-0.86)
Fatal/non-fatal MI	6.1%	8.7%	0.69 (0.58-0.81)
Fatal/non-fatal stroke	2.4%	3.3%	0.72 (0.55-0.93)
CV death	4.3%	5.2%	0.80 (0.66-0.98)
All cause mortality	6.7%	7.6%	0.87 (0.74-1.02)
1° composite = 4.8% ARR (NNT=21)			

N Engl J Med. 2019 Jan 3;380(1):11-22.

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ADA 2109 Recommendations

- In patients with ASCVD or other cardiac risk factors on a statin with *controlled* LDL-C, but elevated triglycerides (135-499 mg/dL), the addition of icosapent ethyl ***should*** be considered to reduce cardiovascular risk. (A)

ADA Standards of Medical Care in Diabetes 2019 [web annotation]. Diabetes Care 2019;42(Suppl. 1):S103–S123.

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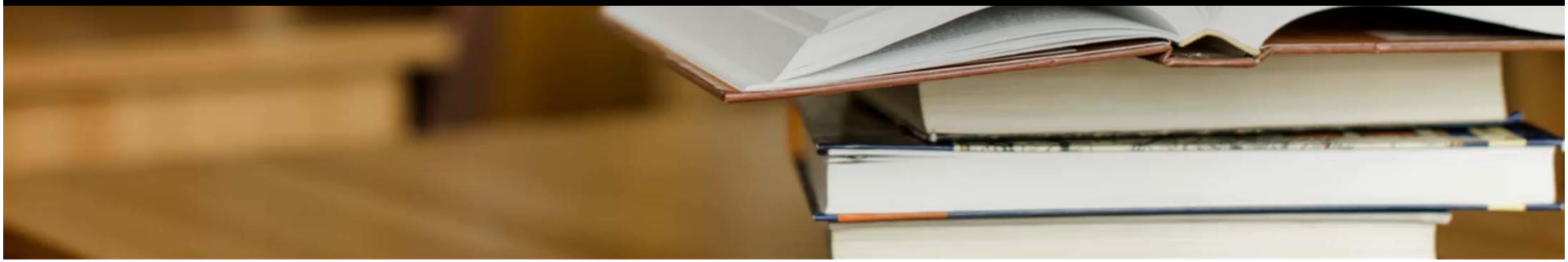
Agents in development

- Bempedoic acid (just approved by FDA)
  - – LDL-C lowering
- EPA/DHA carboxylic acids
  - TG-lowering in moderate hypertriglyceridemia
- Pemafibrate
  - TG-lowering in moderate hypertriglyceridemia

Top 10 Take-Home Messages

2018 Cholesterol Guidelines

(pages 4-5)



Top 10 Take Home Messages

1. **In all individuals, emphasize a heart-healthy lifestyle across the life course**.

   A healthy lifestyle reduces atherosclerotic cardiovascular disease (ASCVD) risk at all ages. In younger individuals, healthy lifestyle can reduce development of risk factors and is the foundation of ASCVD risk reduction.

   In young adults 20 to 39 years of age, an assessment of lifetime risk facilitates the clinician–patient risk discussion (see No. 6) and emphasizes intensive lifestyle efforts. In all age groups, lifestyle therapy is the primary intervention for metabolic syndrome.

Top 10 Take Home Messages

2. **In patients with clinical ASCVD, reduce low-density lipoprotein cholesterol (LDL-C) with high-intensity statin therapy or maximally tolerated statin therapy.**

   The more LDL-C is reduced on statin therapy, the greater will be subsequent risk reduction.

   Use a maximally tolerated statin to lower LDL-C levels by ≥50%.

Top 10 Take Home Messages

3. In very high-risk ASCVD, use a LDL-C threshold of 70 mg/dL (1.8 mmol/L) to consider addition of nonstatins to statin therapy.

- Very high-risk includes a history of multiple major ASCVD events or 1 major ASCVD event and multiple high-risk conditions.
- In very high-risk ASCVD patients, it is reasonable to add ezetimibe to maximally tolerated statin therapy when the LDL-C level remains ≥70 mg/dL (≥1.8 mmol/L).
- In patients at very high risk whose LDL-C level remains ≥70 mg/dL (≥1.8 mmol/L) on maximally tolerated statin and ezetimibe therapy, adding a PCSK9 inhibitor is reasonable,
  although the long-term safety (>3 years) is uncertain and cost-effectiveness is low at mid-2018 list prices.

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Top 10 Take Home Messages

4. **In patients with severe primary hypercholesterolemia (LDL-C level ≥ 190 mg/dL[≥4.9 mmol/L]) without calculating 10-year ASCVD risk, begin high-intensity statin therapy without calculating 10-year ASCVD risk.**

   - If the LDL-C level remains ≥100 mg/dL (≥2.6 mmol/L), adding ezetimibe is reasonable

   - If the LDL-C level on statin plus ezetimibe remains ≥100 mg/dL (≥2.6 mmol/L) & the patient has multiple factors that increase subsequent risk of ASCVD events, a PCSK9 inhibitor may be considered, although the long-term safety (>3 years) is uncertain and economic value is low at mid-2018 list prices.

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Top 10 Take Home Messages

5. **In patients 40 to 75 years of age with diabetes mellitus and LDL-C ≥70 mg/dL (≥1.8 mmol/L), start moderate-intensity statin therapy without calculating 10-year ASCVD risk.**

   In patients with diabetes mellitus at higher risk, especially those with multiple risk factors or those 50 to 75 years of age, it is reasonable to use a high-intensity statin to reduce the LDL-C level by ≥50%.

Top 10 Take Home Messages

6. **In adults 40 to 75 years of age evaluated for primary ASCVD prevention, have a clinician–patient risk discussion before starting statin therapy.**

   Risk discussion should include a review of major risk factors (e.g., cigarette smoking, elevated blood pressure, (LDL-C), hemoglobin A1C [if indicated], and calculated 10-year risk of ASCVD);

   - the presence of risk-enhancing factors (see No. 8);
   - the potential benefits of lifestyle and statin therapies;
   - the potential for adverse effects and drug–drug interactions;
   - the consideration of costs of statin therapy; and
   - the patient preferences & values in shared decision-making.

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Top 10 Take Home Messages

7. **In adults 40 to 75 years of age without diabetes mellitus and with LDL-C levels ≥70 mg/dL (≥1.8 mmol/L), at a 10-year ASCVD risk of ≥7.5%, start a moderate-intensity statin if a discussion of treatment options favors statin therapy.**

   Risk-enhancing factors favor statin therapy (see No. 8).

   If risk status is uncertain, consider using coronary artery calcium (CAC) to improve specificity (see No. 9). If statins are indicated, reduce LDL-C levels by ≥30%, and if 10-year risk is ≥20%, reduce LDL-C levels by ≥50%.

Top 10 Take Home Messages

8. **In adults 40 to 75 years of age without diabetes mellitus and 10-year risk of 7.5% to 19.9% (intermediate risk), risk-enhancing factors favor initiation of statin therapy (see No. 7).**

   Risk-enhancing factors include

   - family history of premature ASCVD;
   - persistently elevated LDL-C levels ≥160 mg/dL (≥4.1 mmol/L);
   - metabolic syndrome;
   - chronic kidney disease;

   - history of preeclampsia or premature menopause (age <40 yrs)
   - chronic inflammatory disorders (e.g., rheumatoid arthritis, psoriasis, or chronic HIV);
   - high-risk ethnic groups (e.g., South Asian);
   - persistent elevations of triglycerides ≥ 175 mg/dL (≥1.97 mmol/L);

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Top 10 Take Home Messages

8. **In adults 40 to 75 years of age without diabetes mellitus and 10-year risk of 7.5% to 19.9% (intermediate risk), risk-enhancing factors favor initiation of statin therapy (see No. 7).**

Risk-enhancing factors include

and, if measured in selected individuals

- apolipoprotein B ≥130 mg/dL
- high-sensitivity C-reactive protein ≥2.0 mg/L
- ankle-brachial index <0.9 and l
- lipoprotein (a) ≥50 mg/dL or 125 nmol/L, especially at higher values of lipoprotein (a).

Risk-enhancing factors may favor statin therapy in patients at 10-year risk of 5-7.5% (borderline risk)

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Top 10 Take Home Messages

9. In adults 40 to 75 years of age without diabetes mellitus and with LDL-C levels ≥70 mg/dL- 189 mg/dL (≥1.8-4.9 mmol/L), at a 10-year ASCVD risk of ≥7.5% to 19.9%, if a decision about statin therapy is uncertain, consider measuring CAC.

- If CAC is zero, treatment with statin therapy may be withheld or delayed, except in cigarette smokers, those with diabetes mellitus, and those with a strong family history of premature ASCVD.
- A CAC score of 1 to 99 favors statin therapy, especially in those ≥55 years of age.
- For any patient, if the CAC score is ≥100 Agatston units or ≥75th percentile, statin therapy is indicated unless otherwise deferred by the outcome of clinician–patient risk discussion.

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Top 10 Take Home Messages

10. Assess adherence and percentage response to LDL-C–lowering medications and lifestyle changes with repeat lipid measurement 4 to 12 weeks after statin initiation or dose adjustment, repeated every 3 to 12 months as needed.

- Define responses to lifestyle and statin therapy by percentage reductions in LDL-C levels compared with baseline.
- In ASCVD patients at very high-risk, triggers for adding nonstatin drug therapy are defined by threshold LDL-C levels ≥70 mg/dL (≥1.8 mmol/L) on maximal statin therapy (see No. 3).

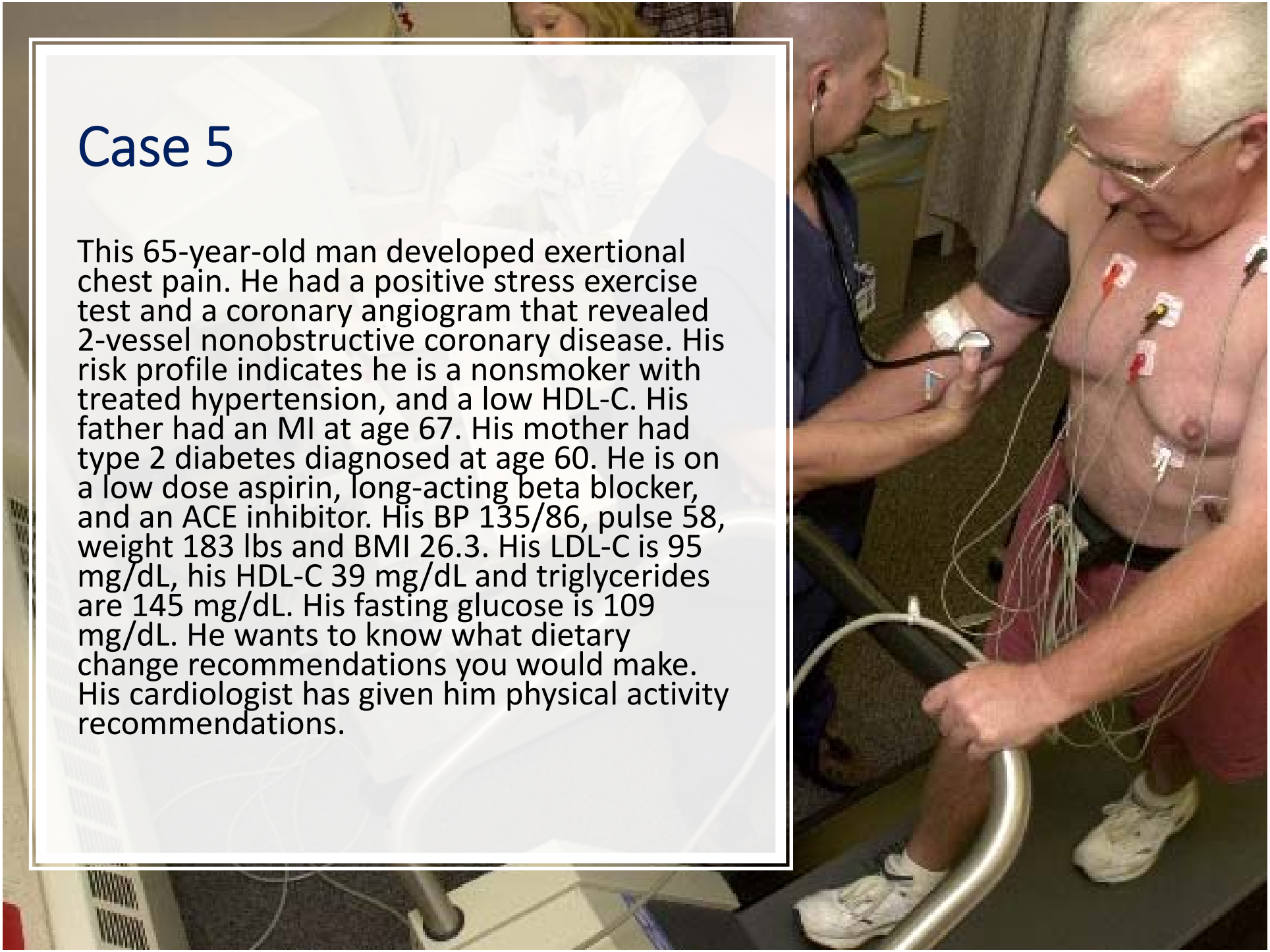
Discussion Cases 4-12

Case 4

A 42-year-old man has gained 35 pounds since he graduated from college and started working as a computer programmer. He has never smoked. He has treated hypertension. He has tried several popular diets to lose weight and lost about 20 pounds each time, but he always regains the weight lost within one year. He bowls once a week. He weighs 220 lbs and his BMI is 32.5, and the highest it has ever been. His BP is 138/92. His labs show total cholesterol 218 mg/dL, triglycerides 188 mg/dL, HDL-C 40 mg/dL, LDL-C 138 mg/dL, and non HDL-C 178 mg/dL. His fasting glucose is 101 mg/dL. His father died of an MI at age 73.

Case 5

This 65-year-old man developed exertional chest pain. He had a positive stress exercise test and a coronary angiogram that revealed 2-vessel nonobstructive coronary disease. His risk profile indicates he is a nonsmoker with treated hypertension, and a low HDL-C. His father had an MI at age 67. His mother had type 2 diabetes diagnosed at age 60. He is on a low dose aspirin, long-acting beta blocker, and an ACE inhibitor. His BP 135/86, pulse 58, weight 183 lbs and BMI 26.3. His LDL-C is 95 mg/dL, his HDL-C 39 mg/dL and triglycerides are 145 mg/dL. His fasting glucose is 109 mg/dL. He wants to know what dietary change recommendations you would make. His cardiologist has given him physical activity recommendations.



Case 6

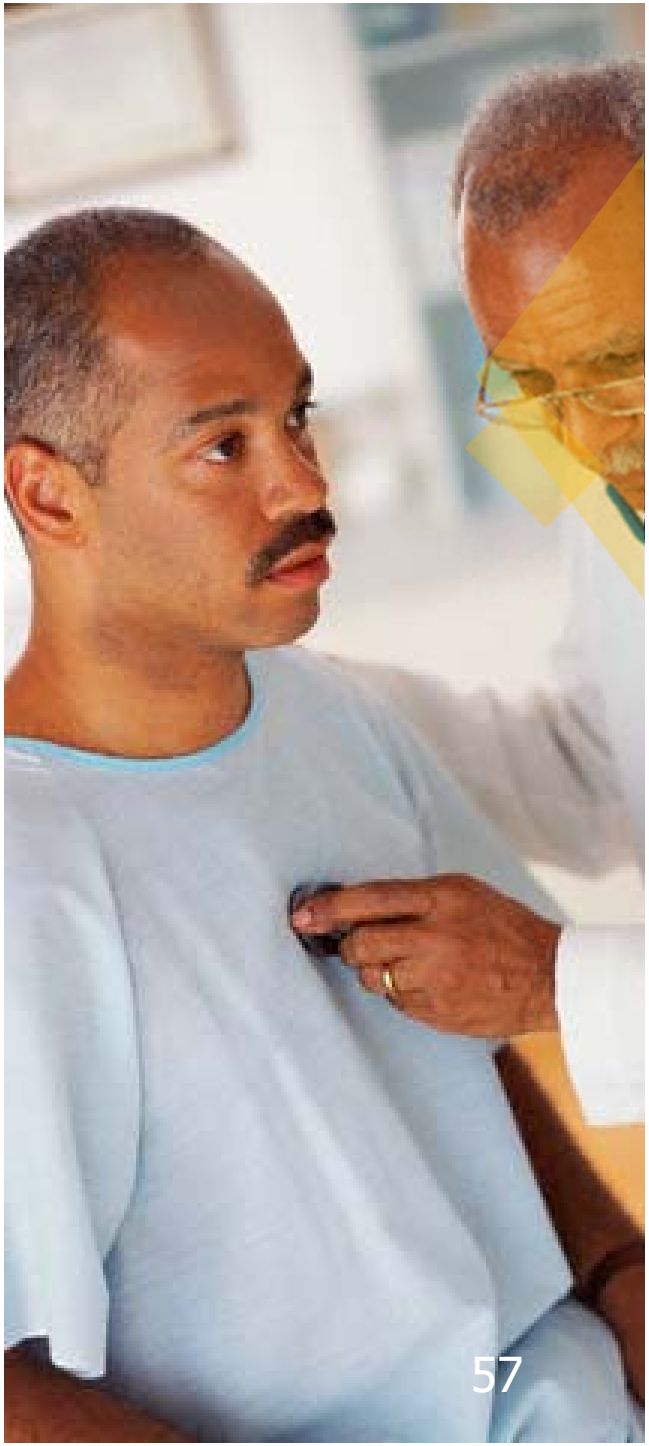
A 63-year-old man is seen in the office 2 weeks after a ST-elevation myocardial infarction (MI). A former smoker with hypertension, he was discharged on atorvastatin 80 mg daily, dual anti-platelet therapy, long-acting metoprolol, and an ACE inhibitor. One year before the acute MI, he was prescribed simvastatin 40 mg which was then increased to simvastatin 80 mg. He stopped the simvastatin 80 mg 2 weeks later after developing muscle cramps in his legs. At that time he was also on Verapamil for his hypertension. Although he has no muscle symptoms since he started the atorvastatin 80 mg, he is concerned about having had muscle cramps in the past on a statin and would like to decrease the atorvastatin to 20 mg daily.

Case 6 follow up

After 4 months of treatment with atorvastatin 80 mg daily free of muscle symptoms, the patient's LDL level is 94 mg/dL (≥1.8 mmol/L). What is your plan for treatment?

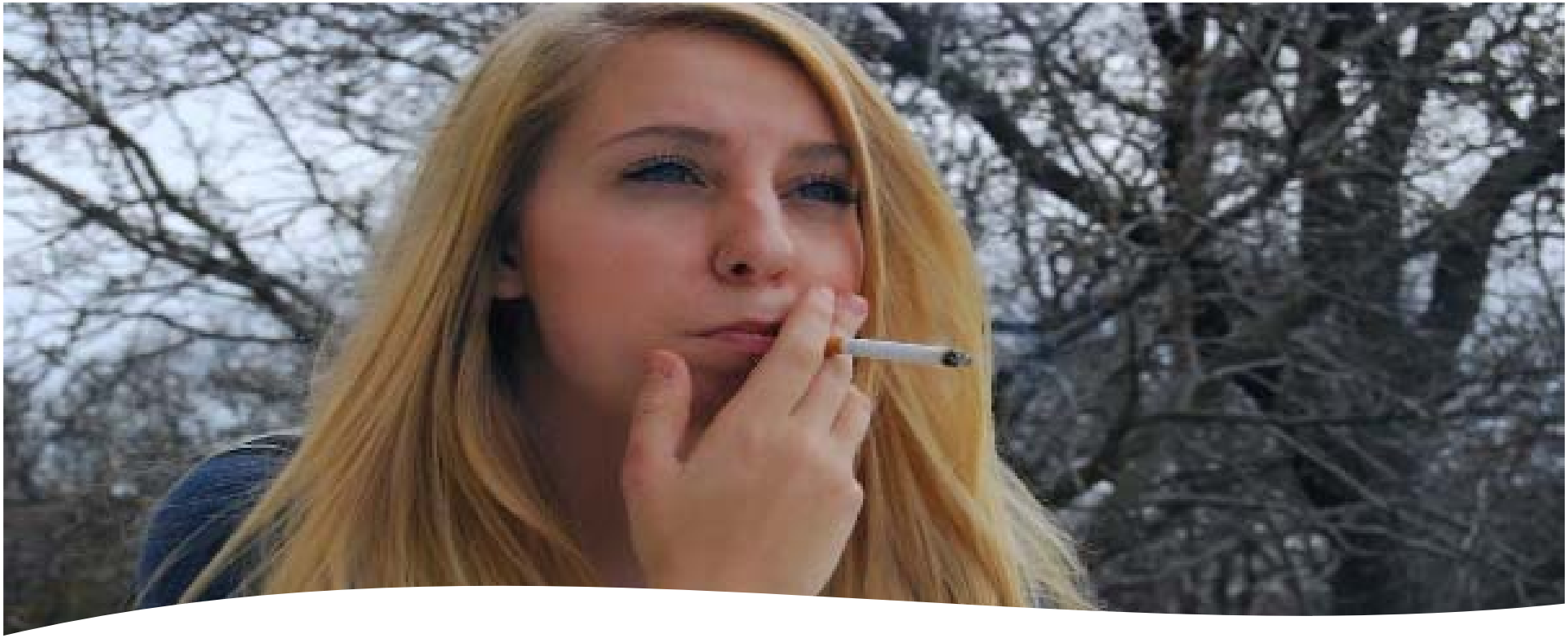
Case 7

A 35-year-old African American man has a strong family history of premature coronary disease, with both father and brother having a MI before age 55. He is a nonsmoker, does not have diabetes and exercises for 150 minutes/week. He has gained 10 lbs since age 18. His BP is 140/90 mm Hg, weight is 170 pounds, height is 70 inches, and BMI is 24.4. On a fasting lipid panel, his LDL-C is 160 mg/dL, HDL-C 45 mg/dL and triglyceride 100 mg/dL. His fasting blood glucose is 92 mg/dL. He is on a heart-healthy diet and exercises 150 minutes a week. He and his wife would like to discuss statin therapy given his strong family history.



Case 8

A 44-year-old woman has a 10-year history of type 2 diabetes. She is a nonsmoker with well-controlled hypertension and microalbuminuria. She is on dietary management and metformin. She also takes Lisinopril/hydrochlorothiazide for her blood pressure. She has a family history of diabetes, but not premature ASCVD. She has a BP 134/78 and a BMI of 36.0. Her fasting lipid panel reveals a Total Cholesterol of 230 mg/dL, triglycerides 250 mg/dL, and HDL-C 38 mg/dL. Her hemoglobin A1c is 7.0%.



Case 9

A 26-year-old woman has an LDL-C of 260 mg/dL, HDL-C of 51 mg/dL, and triglycerides of 102 mg/dL. She reports having elevated LDL-C levels of over 200 mg/dL since her teens and has tried various diets without success but has never taken a drug to lower her cholesterol. She is worried because her father died suddenly at age 38 and her father's brother had a myocardial infarction at age 32. Both were smokers. She has an occasional cigarette and says that it is "social smoking." On exam, BP is 110/60 mm Hg and BMI is 24. Her cardiovascular examination is normal.

Case 10

A 60-year-old African-American woman has asked whether she should be taking a statin to reduce her risk of stroke but is worried about the statin causing diabetes. Her mother had diabetes and had a stroke at age 62. She is a nonsmoker. Blood pressure is 142/88 mm Hg on 2 antihypertensive medications and BMI is 31. She self medicates with a baby aspirin every day because she read that aspirin decreases the risk of heart attacks. Her fasting lipid panel reveals a total cholesterol 200 mg/dL, HDL-C 55 mg/dL, triglyceride 100 mg/dL, and LDL-C 125 mg/dL. Her fasting blood sugar is 109 mg/dL and hemoglobin A1c is 5.9% (prediabetes).

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Case 11

A 48-year-old man with FH and history of 3-vessel coronary artery bypass surgery 7 years ago sees you now for statin intolerance. The maximum dose of statin that he can tolerate is rosuvastatin 10 mg every other day. On more frequent dosing he developed shoulder, low back, and thigh aching without weakness and a normal CK level. He had similar symptoms on low doses of simvastatin, atorvastatin and pravastatin. On rosuvastatin 10 mg twice a week, his most recent LDL-C was 160 mg/dL, triglycerides were 138 mg/dL, and HDL-C was 46 mg/dL.

Case 12

- A 12-year-old boy with no significant medical history except obesity presents to clinic today for management of his weight. His BMI is 27 kg/$m^{2,}$ placing him at the 97 percentile for boys his age (refer to obesity notes). His fasting lipid panel reveals a total cholesterol 220 mg/dL, HDL-C 55 mg/dL, triglyceride 100 mg/dL, and LDL-C (please calculate). Develop a detailed therapeutic plan for this patient.