

Dyslipidemia

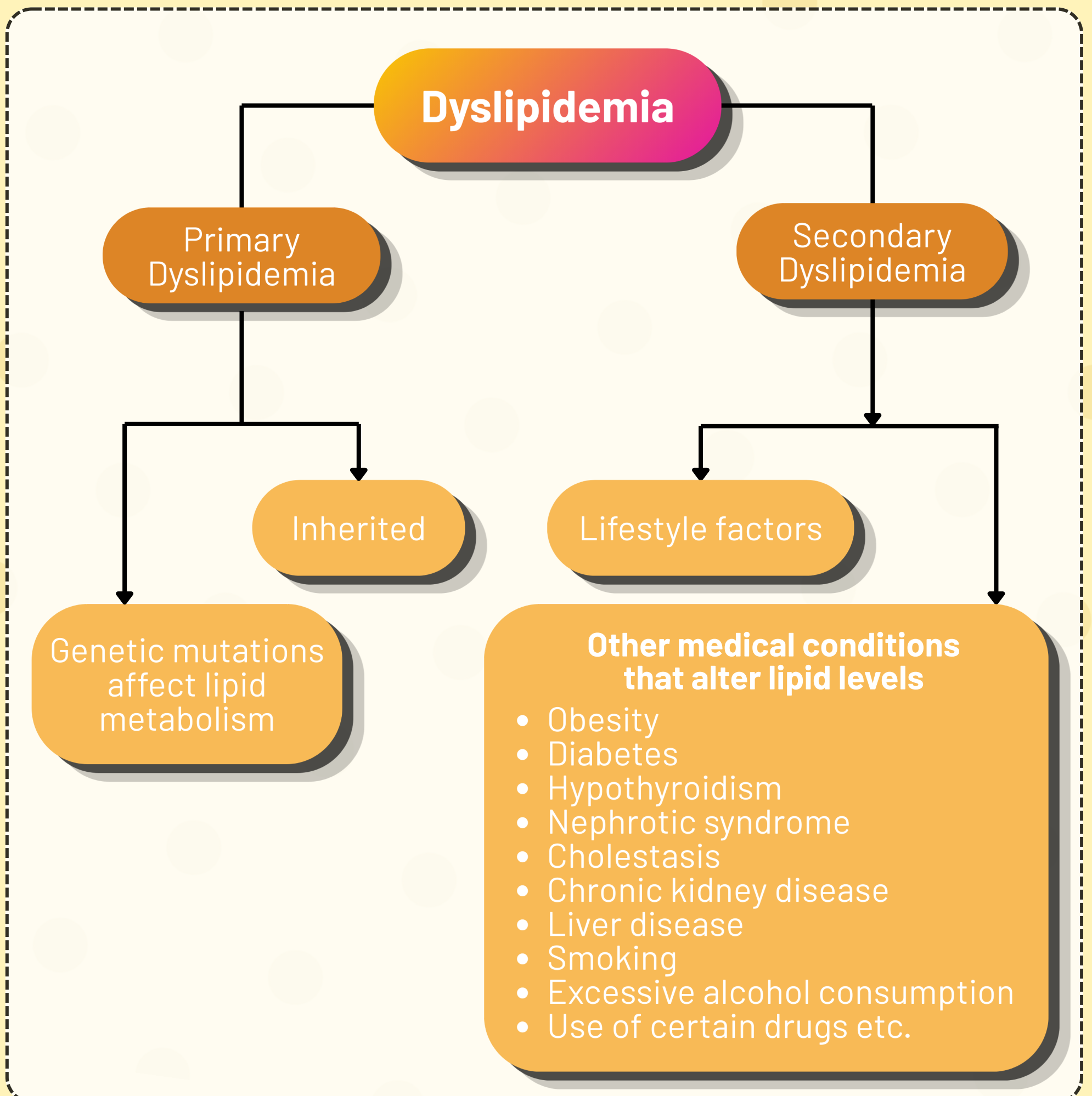
Matrix Unlocked



Definition

- Abnormal levels of lipids in the bloodstream
- ↑ risk of atherosclerosis and cardiovascular (CV) disease

Classification



Clinical Manifestations



DYSLIPIDEMIA ALONE IS OFTEN ASYMPTOMATIC !!

Clinical manifestations usually arise from:

1. Lipid deposition in tissues
2. Complications of atherosclerosis

Direct lipid deposition

1. Xanthelasma



2. Palmar xanthomas



3. Tendon xanthomas



4. Eruptive xanthomas



5. Arcus Senilis



Suggests severe hypertriglyceridemia!!

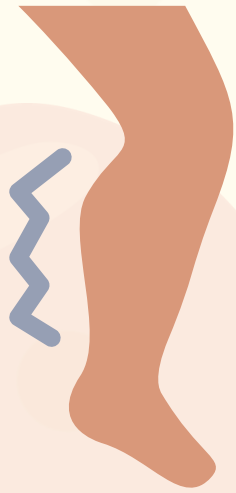


**In patients < 40 years:
Suggests severe hypercholesterolemia!!**

Complications of atherosclerosis

1. Peripheral Artery Disease

- Intermittent claudication
- Pain relieved by rest
- Severe cases → rest pain, ulcers, gangrene



2. Transient Ischemic Attack (TIA) / Stroke

- Sudden weakness (usually unilateral)
- Slurred speech
- Visual disturbance
- Facial droop



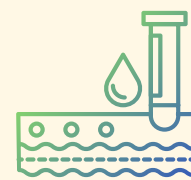
3. Coronary artery disease

- Chest pain with exertion
- Radiates to neck, jaw, shoulder, and back
- Relieved by rest



Investigations

1. ASCVD risk
2. Routine Lipid Panel



Classification of CV risk

Step 1: Identify people for CVD risk assessment

In people without known Atherosclerotic Cardiovascular Disease (ASCVD) :

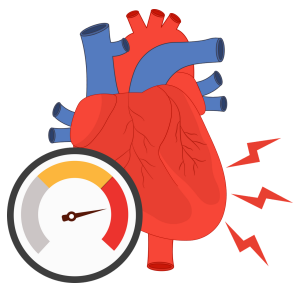
- 45 - 79 years
- 35 - 79 years with diabetes
- 30 - 79 years and are a First Nations person

- > 79 years
 - **Underestimate risk**
- Do not use calculator in those already known to be at high risk:
 - **Moderate-to-severe CKD and Familial Hypercholesterolemia**

Step 2: Use Aus CVD Risk calculator to assess CVD risk

Variables involved:

- Age, sex
- Smoking status
- Systolic BP
- TC: HDL-C ratio
- Diabetes status
- CVD medicines
- Postcode
- History of atrial fibrillation



For people with diabetes:

- HbA1c
- Time since diagnosis of diabetes
- uACR
- eGFR
- BMI
- Insulin



Classification of CV risk

Step 3: Identify CVD risk category

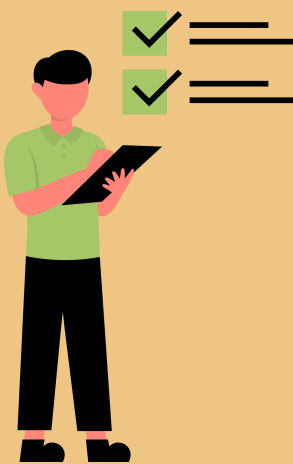
Australian Chronic Disease Prevention Alliance (ACDPA)
Aus CVD Risk Calculator estimates a person's risk over 5 years :



Risk Category	Estimated 5-year CVD Risk
< 5%	Low risk
5% - 10%	Intermediate risk
> 10%	High risk

Reclassification factors (may move an individual's risk estimate up or down):

- Ethnicity
- Family history of premature CVD
- eGFR & uACR
- Severe mental illness
- Coronary artery calcium (CAC) scoring



Source: AusCVDRisk



Goals of management

ASCVD risk	Established or Very high	High	Intermediate	Low
LDL-c ↓ (Primary Target)	≥ 50% ↓ from baseline & < 1.4 mmol/L (whichever is lowest)	≥ 50% ↓ from baseline & < 1.8 mmol/L (whichever is lowest)	< 2.6 mmol/L	< 3.0 mmol/L
non-HDL-c ↓	< 2.2 mmol/L	< 2.6 mmol/L	< 3.4 mmol/L	< 3.8 mmol/L
Triglycerides ↓	< 1.7 mmol/L	< 1.7 mmol/L	< 2.0 mmol/L	< 2.0 mmol/L

Source: Therapeutic Guidelines

Risk Category	Management	Reassessment Interval
High risk / Established ASCVD	- Start lipid-modifying drug therapy + lifestyle modification - Pharmacotherapy is necessary even if LDL is not markedly elevated	Formal reassessment of CVD is not generally required
Intermediate risk	- Lifestyle modification - Consider lipid-modifying therapy - Shared decision-making with patients weighing: - Absolute benefit - Risk factors - Patient preferences	Reassess risk every 2 years if not currently receiving pharmacotherapy to reduce CVD risk
Low risk	- Lifestyle modification first - Lipid-modifying therapy is not routinely recommended	Reassess risk every 5 years

For First Nations people in low/intermediate risk, reassess every year as part of an annual checkup, or at least every 2 years.

Management (Lifestyle Modification)

1 DIET MODIFICATION

DIET SUGGESTIONS

Mediterranean diet

Diet supplemented with extra-virgin olive oil and nuts

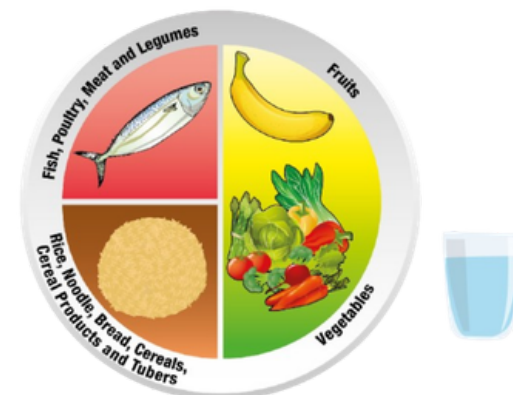


Malaysian Healthy Plate Guideline (#QuarterQuarterHalf diet)

1/4: Carbohydrates - rice, noodles, bread, cereals

1/4: Protein - fish, poultry, meat and/or legumes

1/2: Fruits and vegetables



Drink plain water



Other suggestions:

Low salt intake (5 g of salt/day = 1 teaspoon)

Limit red meats and avoid processed meats (burger, sausage)

Reduce saturated & trans fats (deep-fried fast foods, margarine)



2 PHYSICAL ACTIVITY

- Moderate-intensity aerobic exercise
 - ≥ 150 minutes weekly
- AND/OR
- Vigorous-intensity aerobic exercise
 - ≥ 75 minutes weekly
- Strength training $\geq 2x$ / week

3 WEIGHT LOSS



- Asian target
 - BMI: 18.5 - 24.9
 - Waist circumference:
 - $< 90\text{cm}$ (men)
 - $< 80\text{cm}$ (women)
- Gradual and sustained loss of 5 - 10 % of initial body weight over 6 - 12 months

4 SMOKING CESSATION



5 ALCOHOL RESTRICTIONS



Management

(Pharmacotherapy)

STEP 1: START STATIN

- **First-line** lipid-modifying therapy
- HMG CoA reductase inhibitors
 - ↓ LDL 25–55%
 - ↓ Triglycerides 10–20%
- Use maximum tolerated dose
- Taken once daily
- Reassess lipids after 6 weeks



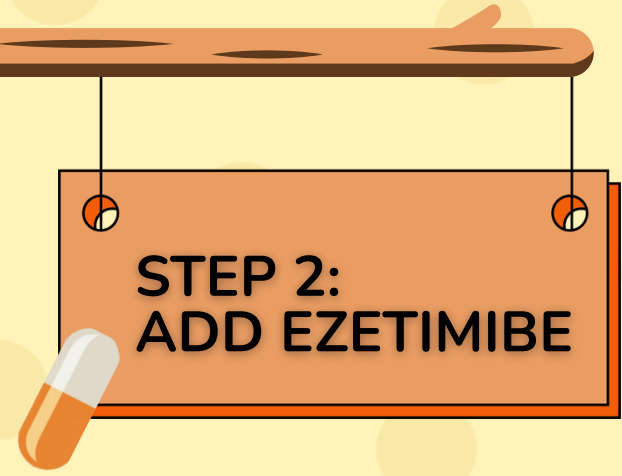
**CONTRAINDICATED IN
PREGNANCY AND LACTATION**

High Intensity (>50% reduction in LDL-C)	Moderate Intensity (30–49% reduction in LDL-C)	Low Intensity (<30% reduction in LDL-C)
Atorvastatin 40-80 mg	Atorvastatin 10-20 mg	
Rosuvastatin 20-40 mg	Rosuvastatin 5-10 mg	
Indications • Established ASCVD • Secondary prevention of CV events • Primary prevention in very high or high ASCVD risk • Had a CV event	Simvastatin 20-40 mg	Simvastatin 10 mg
	Pravastatin 40-80 mg	Pravastatin 10-20 mg
	Lovastatin 40-80 mg	Lovastatin 20 mg

ADVERSE EFFECTS OF STATINS (RARE)

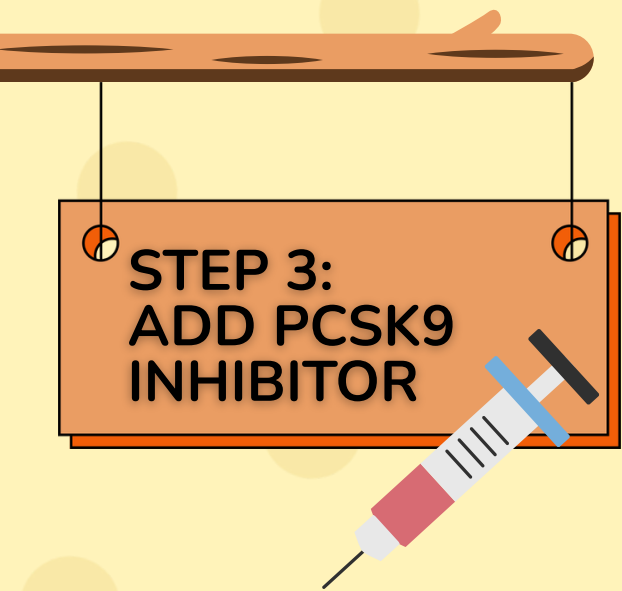
1. Muscle symptoms
2. Changes in liver biochemistry
3. Rhabdomyolysis
 - Life-threatening
 - **DO NOT restart statin in confirmed rhabdomyolysis cases**
4. Necrotising autoimmune myopathy
 - Life-threatening

Management (Pharmacotherapy)



STEP 2: ADD EZETIMIBE

- Indications:
 - Statins are not tolerated/contraindicated
 - Statin monotherapy is insufficient
- Inhibits intestinal cholesterol absorption
 - ↓ LDL 15–25%
- Taken once daily
- Well tolerated



STEP 3: ADD PCSK9 INHIBITOR

- Indications:
 - Only after statin + ezetimibe is inadequate or not tolerated
- ↑ LDL receptor recycling → ↑ LDL clearance
 - ↓ LDL 60%
 - (alone or with statins)
 - Evolocumab ↓ LDL 20–30%
 - homozygous familial hypercholesterolaemia
 - ↑ HDL
- Subcutaneous injection every 2–4 weeks
- Adverse effects/Limitations
 - Injection site reactions
 - High cost
 - Lack long-term safety data

(Other Pharmacotherapy)

Class	Typical effect on lipids	Tolerability	Comments
Fibrates 	↓ LDL ↓ Triglycerides ↑ HDL	 - GI disturbances - Gallstones	Used in severe hypertriglyceridemia (triglycerides >10 mmol/L) to prevent pancreatitis
Fish oils (omega-3 fatty acids) 	↓ Triglycerides	High doses ↑ bleeding time	Used in hypertriglyceridemia or with LDL-lowering medications in mixed hyperlipidemia
Nicotinic acid 	↓ LDL ↓ Triglycerides ↑ HDL	- Poorly tolerated - Flushing	May be used for hypertriglyceridemia or in combination therapy for mixed hyperlipidemia (if tolerated)
Colestyramine (bile acid binding resin)	↓ LDL ↑ Triglycerides	 - GI disturbances - Poorly tolerated	May be used in combination treatment

Quiz Time!

Question 1



A 39-year-old male with a prior history of myocardial infarction complains of yellow bumps on his elbows and buttocks. Yellow-colored cutaneous plaques are noted in those areas. The lesions occur in crops and have a surrounding reddish halo. Which of the following is the best next step in the evaluation of this patient?

- A. Biopsy of skin lesions
- B. Lipid profile
- C. Uric acid level
- D. Chest x-ray
- E. Liver enzymes

Quiz Time!

Question 2



A 60-year-old white man with a history of myocardial infarction last year has just moved to town and needs to establish care. He has stopped his discharge medications in favor of lifestyle modifications (low-fat diet and exercise). He has no history of hypertension, diabetes, or smoking. His lipid profile shows the following:

- Total cholesterol: 194 mg/dL
- Triglycerides: 140 mg/dL
- HDL: 42
- LDL (calculated): 124
- ECG shows Q waves in leads II, II, and aVF

Which of the following recommendations would most optimally treat his lipid status?

- A. Continue current dietary efforts and exercise
- B. Add an HMG-CoA reductase inhibitor (statin drug)
- C. Add a fibric acid derivative such as gemfibrozil
- D. Review previous medications and resume an angiotensin-converting enzyme inhibitor
- E. Begin aspirin 81 mg daily

References

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