

1. A 52-year-old patient presents with elevated LDL and reduced HDL levels, along with a history of smoking and hypertension. Considering the pathophysiological role of lipoproteins in atherosclerosis, which of the following statements BEST explains the mechanism by which LDL contributes to arterial plaque formation?

- A. LDL directly binds macrophages and inhibits foam cell formation in the intima
- B. LDL accumulates in the arterial intima, becomes oxidized, and triggers inflammatory responses leading to foam cell formation
- C. LDL increases endothelial nitric oxide production, thereby promoting vasodilation
- D. LDL prevents monocyte migration into the arterial wall by stabilizing endothelial cells
- E. LDL enhances HDL-mediated reverse cholesterol transport

2. In the context of lipoprotein metabolism, which of the following statements most accurately describes the structural and functional characteristics of HDL particles in comparison to LDL?

- A. HDL contains a high proportion of triglycerides and primarily delivers lipids to peripheral tissues
- B. HDL is synthesized in the intestine only and lacks apolipoproteins
- C. HDL facilitates reverse cholesterol transport and is associated with decreased atherosclerosis risk
- D. HDL binds LDL receptors using Apo B-100 to increase cholesterol uptake
- E. HDL is primarily responsible for transporting dietary triglycerides

3. A researcher is analyzing apolipoprotein function in lipid metabolism. Which of the following correctly describes the role of Apo C-II in lipoprotein physiology?

- A. It inhibits lipoprotein lipase activity and prevents triglyceride hydrolysis
- B. It acts as a cofactor for lipoprotein lipase, facilitating hydrolysis of triglycerides
- C. It binds LDL receptors and mediates LDL internalization
- D. It activates LCAT to esterify free cholesterol
- E. It prevents hepatic uptake of VLDL remnants

4. During evaluation of lipid transport pathways, a student incorrectly states that chylomicrons are synthesized in the liver. Which of the following statements correctly describes chylomicrons?

- A. They are synthesized in hepatocytes and transport endogenous cholesterol
- B. They have the highest density among lipoproteins
- C. They transport dietary triglycerides from the intestine to circulation
- D. They primarily carry cholesterol esters to peripheral tissues
- E. They are precursors of HDL particles

5. A patient with familial hypercholesterolemia shows markedly elevated LDL levels. What is the MOST likely underlying defect?

- A. Increased synthesis of Apo A-I leading to HDL deficiency
- B. Defective binding of LDL to LDL receptors due to Apo B-100 abnormality
- C. Increased activity of lipoprotein lipase
- D. Enhanced clearance of LDL by macrophages

- E. Decreased triglyceride synthesis in the liver
6. Which of the following BEST explains the inverse relationship between intracellular cholesterol levels and LDL receptor expression?
- A. High intracellular cholesterol stimulates LDL receptor synthesis
 - B. Increased cholesterol activates HMG-CoA reductase
 - C. High intracellular cholesterol suppresses LDL receptor synthesis and HMG-CoA reductase activity
 - D. LDL receptor expression is independent of intracellular cholesterol
 - E. Low cholesterol decreases LDL uptake
7. A patient presents with eruptive xanthomas and recurrent pancreatitis since childhood. Laboratory findings show massive chylomicron accumulation. Which condition is MOST consistent with this presentation?
- A. Type II hyperlipoproteinemia
 - B. Familial LPL deficiency (Type I)
 - C. Familial combined hyperlipidemia
 - D. Type IV hyperlipoproteinemia
 - E. Dysbetalipoproteinemia
8. Which of the following lipoproteins contains approximately 50% cholesterol and is considered the main carrier of cholesterol to peripheral tissues?
- A. Chylomicrons
 - B. VLDL
 - C. IDL
 - D. LDL
 - E. HDL
9. Apolipoprotein A-I plays a crucial role in lipid metabolism. Which of the following BEST describes its function?
- A. Activates lipoprotein lipase
 - B. Inhibits triglyceride breakdown
 - C. Activates LCAT to esterify cholesterol in HDL
 - D. Binds LDL receptors for cholesterol uptake
 - E. Promotes VLDL synthesis
10. Which of the following statements BEST describes the role of oxidized LDL in atherosclerosis?
- A. It prevents endothelial dysfunction
 - B. It suppresses macrophage activation
 - C. It triggers inflammation and foam cell formation
 - D. It enhances nitric oxide production

E. It reduces plaque formation

11. Which of the following is considered a “negative risk factor” for coronary heart disease?

A. LDL >160 mg/dL

B. HDL <40 mg/dL

C. HDL >60 mg/dL

D. Smoking

E. Hypertension

12. A patient has triglyceride levels of 600 mg/dL. How would this level be classified?

A. Normal

B. Borderline high

C. High

D. Very high

E. Optimal

13. Which of the following lipoproteins is the precursor of LDL?

A. HDL

B. IDL

C. Chylomicrons

D. VLDL remnants

E. Apo A particles

14. A mutation in Apo E would MOST likely impair which of the following processes?

A. HDL formation

B. LDL oxidation

C. Hepatic uptake of remnant lipoproteins

D. Triglyceride synthesis

E. Cholesterol esterification

15. Which of the following conditions is classified as a secondary cause of hyperlipidemia?

A. Familial hypercholesterolemia

B. Dysbetalipoproteinemia

C. Hypothyroidism

D. Apo B mutation

E. LPL deficiency

16. Which of the following BEST describes VLDL?

A. Synthesized in intestine, transports dietary fats

B. Synthesized in liver, transports endogenous triglycerides

C. Contains highest protein content

D. Converts directly to HDL

E. Has highest density

17. Atherosclerosis is BEST described as:

A. Acute infection of arterial walls

B. Chronic inflammatory response to endothelial injury

C. Genetic disorder of collagen synthesis

D. Autoimmune destruction of vessels

E. Purely lipid storage disease

18. Which of the following events occurs FIRST in atherosclerosis?

A. Plaque rupture

B. Foam cell formation

C. Endothelial injury

D. Thrombosis

E. Smooth muscle proliferation

19. Which of the following BEST explains foam cell formation?

A. Smooth muscle cells engulf LDL

B. Macrophages ingest oxidized LDL

C. Platelets accumulate lipids

D. HDL deposits cholesterol

E. Endothelial cells synthesize triglycerides

20. Which of the following lipoproteins has the highest protein content?

A. Chylomicrons

B. VLDL

C. LDL

D. HDL

E. IDL

21. Which apolipoprotein is a marker of total number of atherogenic particles?

A. Apo A-I

B. Apo C-II

C. Apo B-100

D. Apo E

E. Apo A-II

22. Which condition is associated with tendon xanthomas?

- A. Type I
- B. Type II
- C. Type III
- D. Type IV
- E. Type V

23. Which of the following increases risk of atherosclerosis MOST?

- A. High HDL
- B. Low LDL
- C. High Apo B
- D. Low triglycerides
- E. High Apo A-I

24. Which process leads to plaque rupture?

- A. Thick fibrous cap
- B. Lipid depletion
- C. Thin fibrous cap and inflammation
- D. Increased HDL
- E. Reduced macrophages

25. Which enzyme is activated by Apo A-I?

- A. LPL
- B. HMG-CoA reductase
- C. LCAT
- D. ACAT
- E. Lipase

26. Which lipoprotein is lowest in density?

- A. HDL
- B. LDL
- C. IDL
- D. VLDL
- E. Chylomicrons

27. Which condition is associated with Apo C-II deficiency?

- A. Increased LPL activity
- B. Decreased triglyceride breakdown
- C. Increased HDL
- D. Reduced VLDL

E. Increased LDL clearance

28. Which factor aggravates Type V hyperlipoproteinemia?

A. Exercise

B. Alcohol

C. Low-fat diet

D. Fasting

E. Hydration

29. Which lipoprotein removes cholesterol from tissues?

A. LDL

B. VLDL

C. HDL

D. IDL

E. Chylomicrons

30. Which of the following is a modifiable risk factor?

A. Age

B. Genetics

C. Smoking

D. Gender

E. Family history

31. Which artery type is MOST affected by atherosclerosis?

A. Capillaries

B. Small veins

C. Large and medium arteries

D. Lymphatics

E. Arterioles only

32. Which of the following occurs after plaque rupture?

A. Vasodilation

B. Thrombosis

C. Decreased platelet activity

D. Lipid clearance

E. Endothelial repair

33. Which of the following BEST describes IDL?

A. Final lipoprotein form

B. Precursor to LDL

C. Synthesized in intestine

D. High protein content

E. Removes cholesterol

34. Which condition presents with palmar xanthomas?

A. Type II

B. Type III

C. Type IV

D. Type I

E. Type V

35. Which of the following BEST explains LDL calculation using Friedewald formula?

A. Direct measurement of LDL

B. LDL estimated from total cholesterol, HDL, and triglycerides

C. LDL measured via Apo B

D. LDL equals HDL minus triglycerides

E. LDL independent of VLDL

Answers:

1. B

2. C

3. B

4. C

5. B

6. C

7. B

8. D

9. C

10. C

11. C

12. D

13. B

14. C

15. C

16. B

17. B

18. C

19. B

20. D

21. C

22. B

23. C

24. C

25. C

26. E

27. B

28. B

29. C

30. C

31. C

32. B

33. B

34. B

35. B