



Hypercholesterolemia

An overview

For Healthcare Professionals only



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Learning objectives

At the end of this session, you will be able to learn the following:



01

Overview of hypercholesterolemia

02

Hypercholesterolemia as a risk factor for CVD

03

Management of hypercholesterolemia

CVD, cardiovascular disease



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“ Overview of hypercholesterolemia

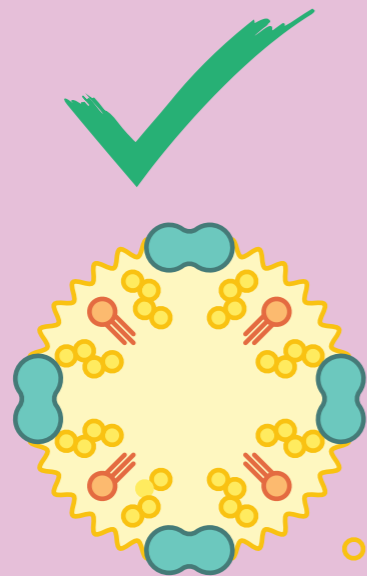


Image adapted from Shutterstock



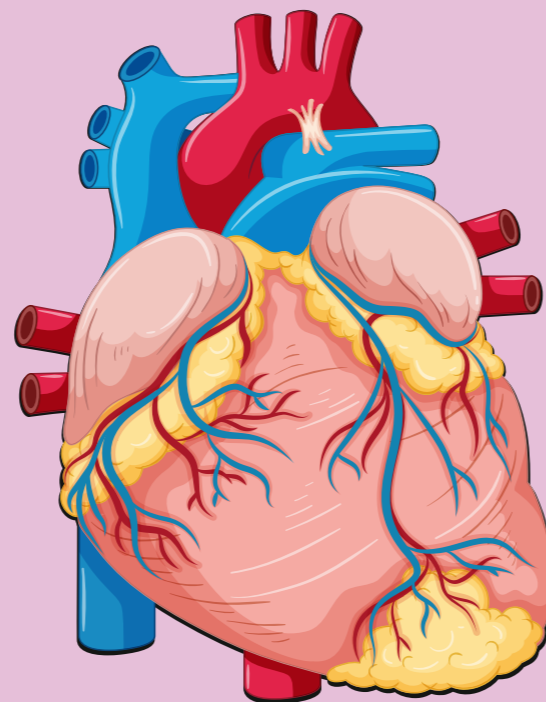
Definition

- Hypercholesterolemia is classified as an elevation of TC and/or LDL-C or non-HDL-C in the blood¹
- It is also referred to as dyslipidaemia as it might be accompanied by a decrease in HDL-C or an increase in triglycerides¹



HDL

(Good cholesterol)



LDL

(Bad cholesterol)



Proteins



Cholesterol



Triglyceride

Image adapted from Shutterstock

TC, total cholesterol; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol



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Hypercholesterolemia by the numbers



**46% rise
in 4 years**
in the local
prevalence of
hypercholesterolemia²



**Almost 1 in 5
Malaysian
adults**
in the 18–19 year
age group had
hypercholesterolemia^{*2}

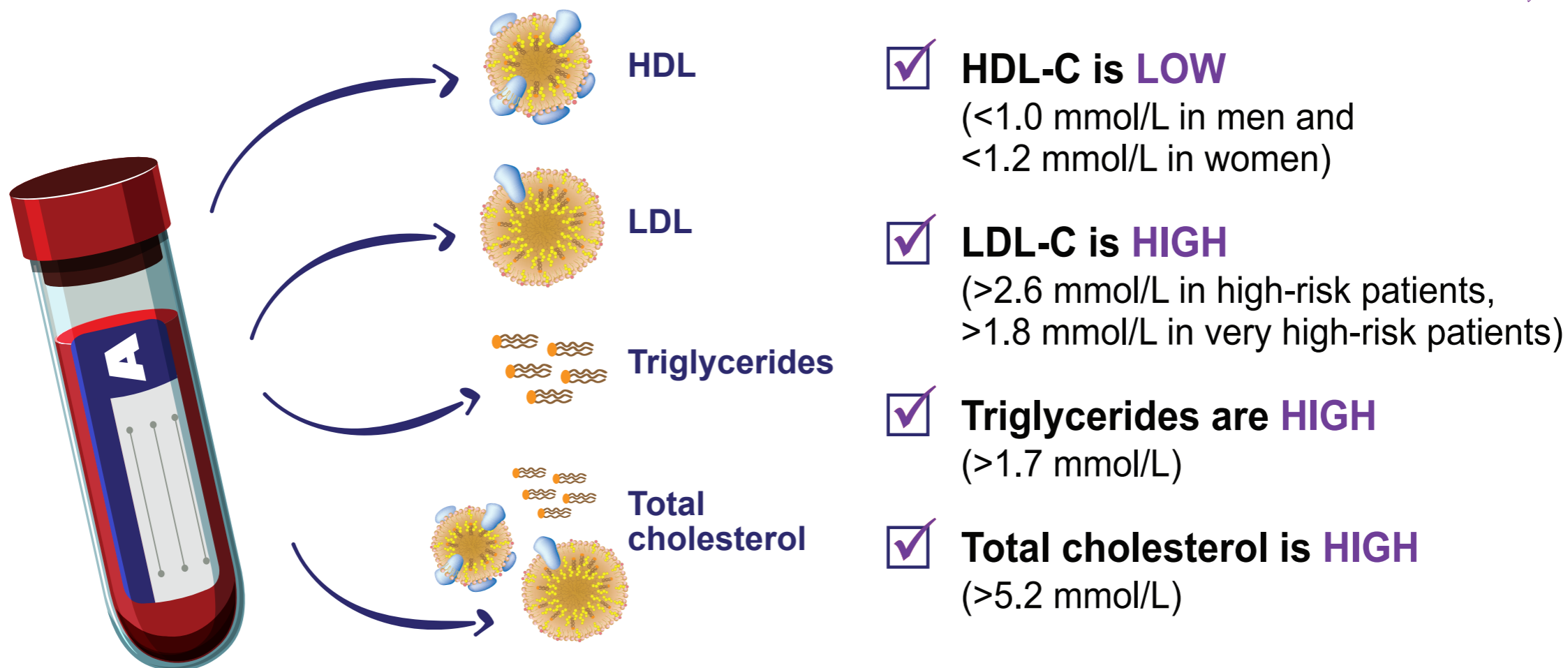


**47.7% of
Malaysian
adults over the
age of 18**
have
hypercholesterolemia,
with total cholesterol
of >5.2 mmol/L^{*2}



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Hypercholesterolemia refers to the following lipid profile²



- ✓ Hypercholesterolemia increases the risk of CVD²
- ✓ Studies have shown that reducing total cholesterol and LDL-C reduces vascular risk and prevents CVD²

LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; CVD, cardiovascular disease



Lowering of LDL-C reduces CVD events, therefore LDL-C is the primary target for cholesterol therapy²



Global Risk	LDL-C Levels to Initiate Drug Therapy (mmol/L)	Target LDL-C Levels (mmol/L)	Non HDL-C Level Corresponding to LDL-C targets in individuals with TG > 4.5 mmol/L
Low CV Risk*	clinical judgement**	< 3.0	< 3.8
Intermediate (Moderate) CV Risk*	> 3.4**	< 3.0	< 3.8
High CV risk >20% 10-year CVD risk Diabetes without target organ damage CKD with GFR 30-<60 mL/min/1.73m ²	> 2.6	≤ 2.6 or a reduction of > 50% from baseline***	≤ 3.4 or a reduction of > 50% from baseline***
Very high CV risk Established CVD, Diabetes with proteinuria or with a major risk factor such as smoking, hypertension or dyslipidaemia, CKD with GFR <30 mL/min/1.73m ² but not dialysis dependent****	> 1.8	< 1.8 or a reduction of > 50% from baseline***	< 2.6 or a reduction of > 50% from baseline***

*Low and Intermediate (moderate) CV risk is assessed using the Framingham General CVD Risk Score

**After a therapeutic trial of 8–12 weeks of therapeutic lifestyle changes and following discussion of the risk:benefit ratio of drug therapy with the patient

***Whichever results in a lower level of LDL-C

****In dialysis-dependent patients, drug therapy is not indicated for primary prevention of CVD

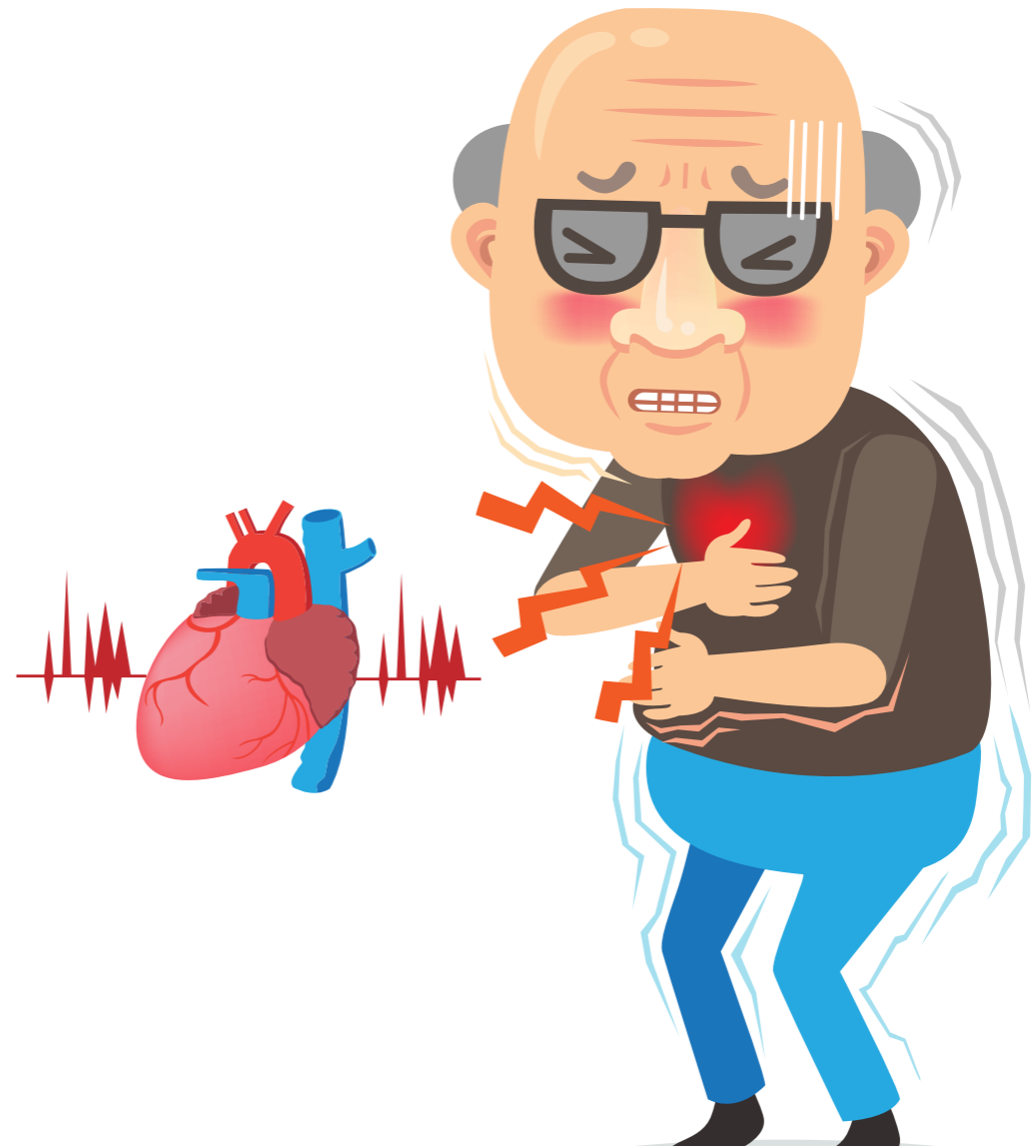
CV, cardiovascular; CVD, cardiovascular disease; TG, triglyceride; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; CKD, chronic kidney disease; GFR, glomerular filtration rate



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“
**Hypercholesterolemia
as a risk factor for CVD**



CVD, cardiovascular disease



- **Hypercholesterolemia is a major risk factor for CVD³**
 - Individuals with high cholesterol levels of $>240\text{mg/dL}$ carry twice the CVD risk of those who are at normal level³
- **Hypercholesterolemia/dyslipidaemia may be primary or secondary to various conditions and diseases, such as nephrotic syndrome, drugs, alcoholism, insulin resistance states such as T2DM and metabolic syndrome²**



Treatment of the underlying aetiology can lead to an improvement in the lipid profile²


CVD, cardiovascular disease; T2DM, type 2 diabetes mellitus



“ Management of hypercholesterolemia



- The intensity of CV risk factor reduction and target lipid levels will depend on an individual's CV risk²

- 
- **Very High Risk** Individuals are those with:
 - ✓ Established CVD
 - ✓ Diabetes with proteinuria or with a major risk factor such as smoking, hypertension or dyslipidaemia
 - ✓ CKD with GFR < 30 mL/min/1.73 m² (≥ Stage 4)
 - **High Risk Individuals** include:
 - ✓ Diabetes without target organ damage
 - ✓ CKD with GFR ≥ 30 - < 60 mL/min /1.73 m² (Stage 3)
 - ✓ Very high levels of individual risk factors (LDL-C > 4.9 mmol/L, BP > 180/110 mmHg)
 - ✓ Multiple risk factors that confer a 10-year risk for CVD > 20% based on the Framingham General (FRS) CVD Risk Score
 - **Intermediate (Moderate) Risk** Individuals:
 - ✓ Have a FRS-CVD score that confer a 10-year risk for CVD of 10-20%
 - **Low Risk** Individuals:
 - ✓ Have a FRS-CVD score that confer a 10-year risk for CVD <10%

CV, cardiovascular; CVD, cardiovascular disease; LDL-C, low-density lipoprotein cholesterol; CKD, chronic kidney disease; GFR, glomerular Filtration rate; FRS, Framingham General



- Therapeutic lifestyle changes remain as the foundation for CVD risk reduction prior to and after initiation of lipid-lowering therapy²

Therapeutic lifestyle changes



Adhering to a healthy diet



Alcohol restriction



Avoidance of tobacco smoking



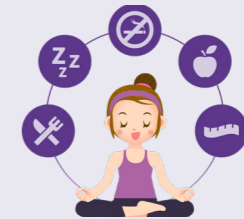
Maintenance of an ideal weight

CVD, cardiovascular disease



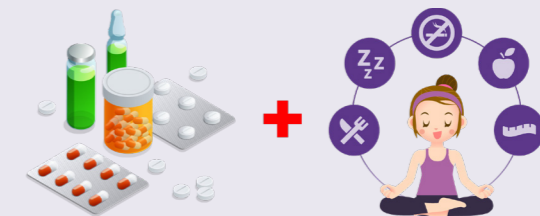
- Most patients at **low and intermediate (moderate) CV risk** can be managed with therapeutic lifestyle changes alone²

Occasionally, drug therapy may be used to achieve target lipid levels²



- Patients who are at very high and high CV risk should be managed with drug treatment in conjunction with therapeutic lifestyle changes²

Statin treatment has been demonstrated effective in reducing CV events in all age groups, irrespective of the LDL-C baseline²



Pharmacotherapy	Indication	Grade of Recommendation, Level Of Evidence
Statins	Very High and High CV Risk	I,A
	Intermediate (Moderate) and Low CV risk*	I,A

*After therapeutic lifestyle changes
Based on recommendations by the Malaysian CPG on the Management of Dyslipidaemia 2017 (5th Edition)

CV, cardiovascular; LDL-C low-density lipoprotein cholesterol



Summary



1. Reduction in total cholesterol and LDL-C reduces vascular risk and prevents CVD²
2. The risk reduction efforts and treatment goals will depend on the individual's CV risk²
3. Statin therapy has been demonstrated effective in reducing CV events in all age groups, irrespective of the LDL-C baseline²

LDL-C, low-density lipoprotein cholesterol; CVD, cardiovascular disease; CV, cardiovascular



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References



1. BMJ Best Practice. Hypercholesterolemia. Available at: <https://bestpractise.bmj.com/topics/en-gb/170>. Accessed 18 February 2023.
2. Ministry of Health Malaysia. 5th Edition of Clinical Practice Guidelines on the Management of Dyslipidaemia 2017. Available at: http://www.acadmed.org.my/view_file.cfm?fileid=849. Accessed 18 February 2023.
3. Stapleton PA, *et al.* *J Inflamm* 2010;7:54.



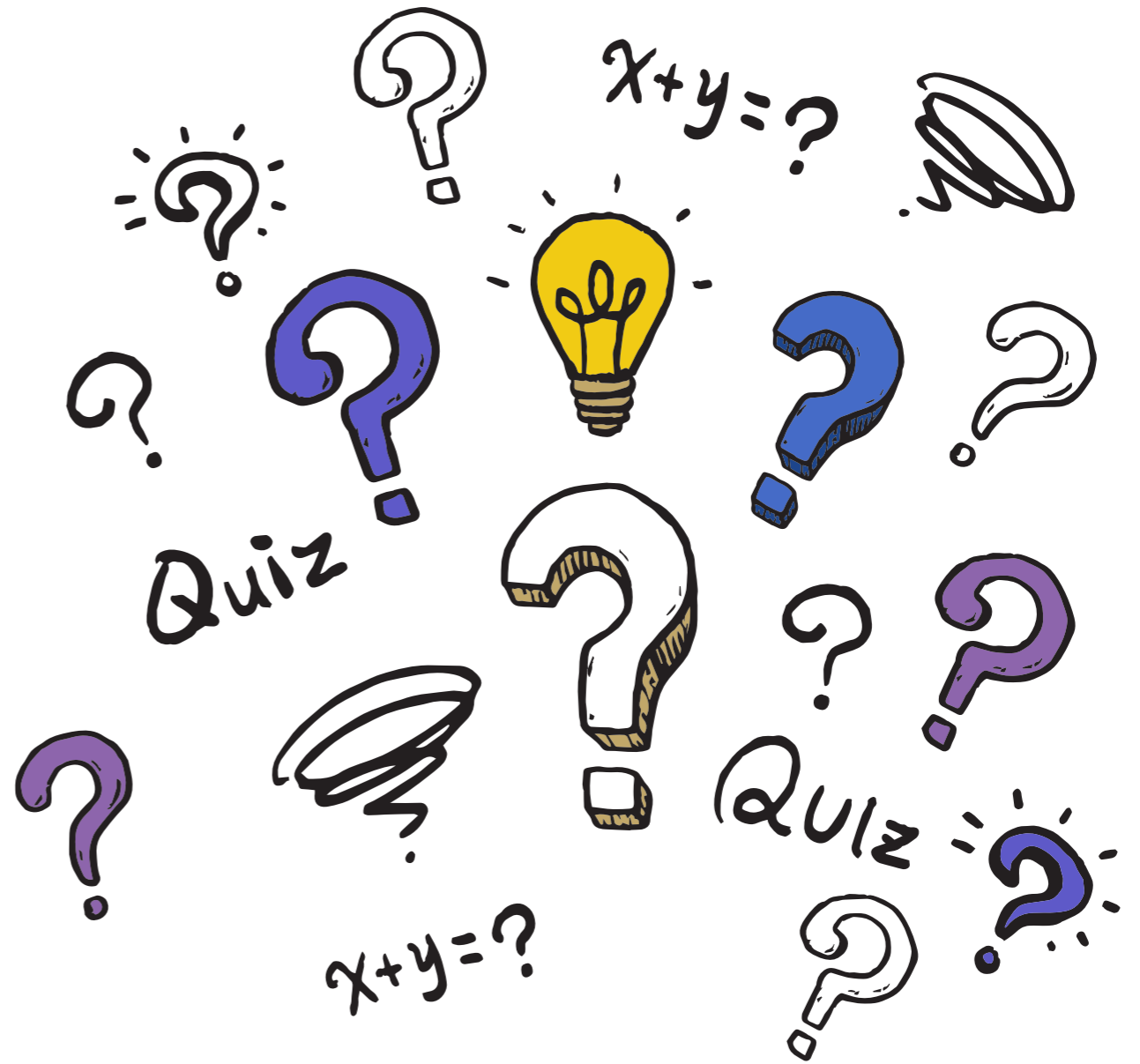
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Q & A

1. Which of the following lipid levels, if reduced may reduce vascular risk and prevent CVD?

- I. HDL-C
- II. LDL-C
- III. Triglycerides
- IV. Total cholesterol

- A. I & II
- B. II & III
- C. I & III
- D. II & IV



Answer:

D



Reference: Ministry of Health Malaysia. 5th Edition of Clinical Practice Guidelines on the Management of Dyslipidaemia 2017.
Available at: http://www.acadmed.org.my/view_le.cfm?leid=849. Accessed 18 February 2023.

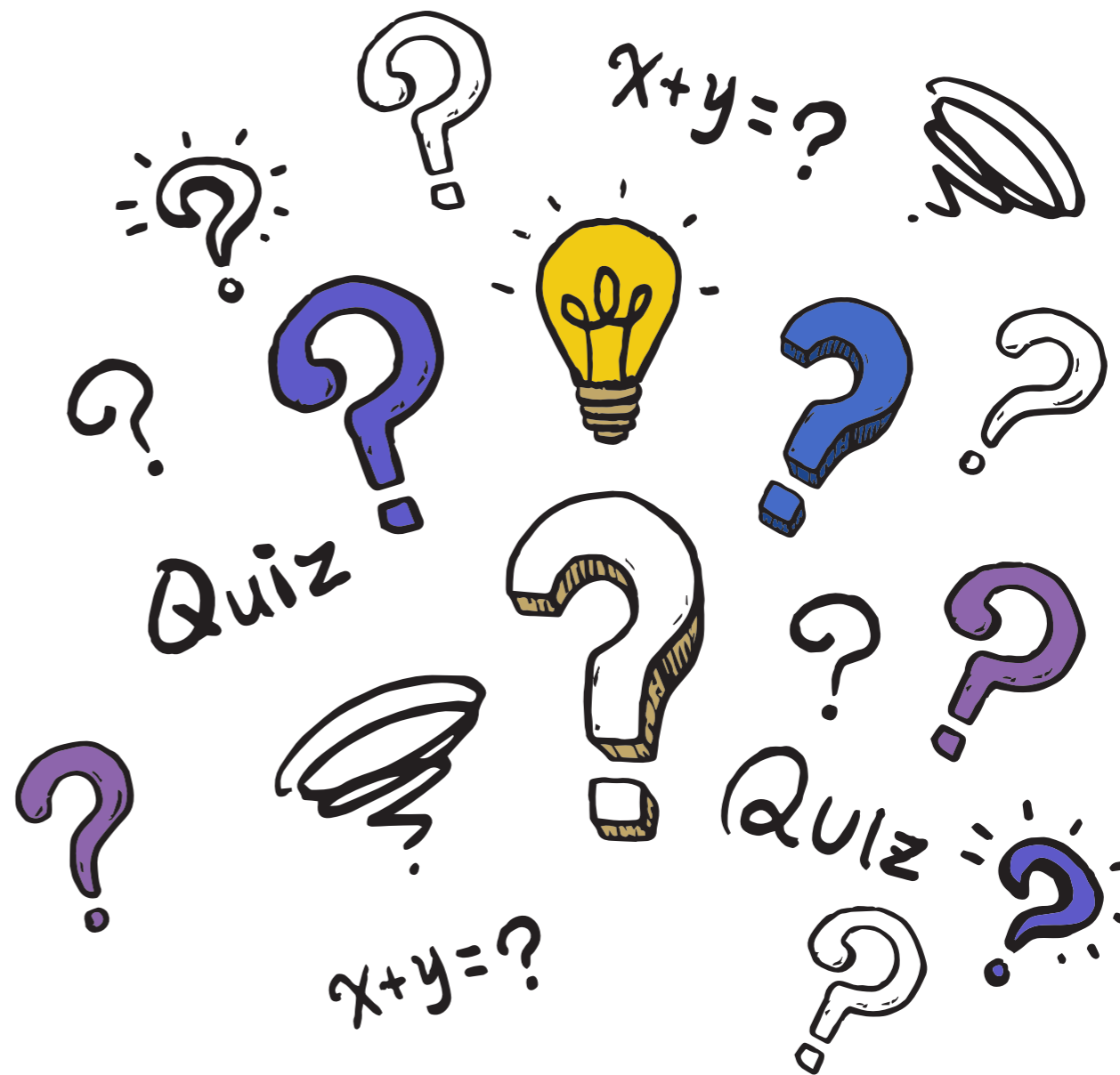


Q & A

2. Statin treatment has been demonstrated effective in reducing CV events in all age groups, irrespective of the LDL-C baseline.

TRUE or FALSE?

- A. TRUE
- B. FALSE



Answer:

A



Reference: Ministry of Health Malaysia. 5th Edition of Clinical Practice Guidelines on the Management of Dyslipidaemia 2017.
Available at: http://www.acadmed.org.my/view_le.cfm?leid=849. Accessed 18 February 2023.





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