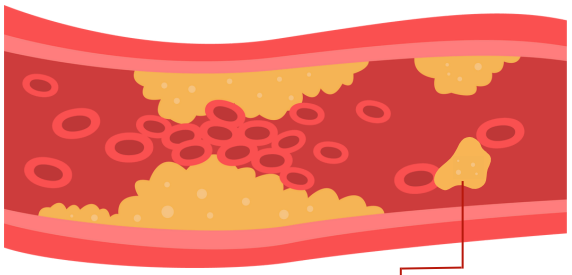
# WHY LIPID PANEL TESTS ARE IMPORTANT FOR YOUR HEART HEALTH

## 01 WHAT IS A LIPID PANEL TEST?

A lipid panel test measures the different fats (lipids) in your blood.[1] Healthcare providers use this test to screen for your risk of cardiovascular (heart and blood vessel) disease.

**People with additional risk factors like old age, smoking, and diabetes may need screenings at least once per year.[2,3]**

Cholesterol (including both 'good and 'bad') is an important class of lipids for heart health.[4] Too much bad cholesterol build-up in the blood vessels leads to inflammation and reduces blood flow, which can cause recurring chest pain (angina).



If the build-up of bad cholesterol breaks, it can block blood flow to the heart and brain, leading to a heart attack and stroke.[4]

## 02 TYPES OF LIPIDS MEASURED AND RECOMMENDED THRESHOLDS

A lipid panel measures the levels of different lipids in your blood. The most important lipids to monitor, in order of priority, are:

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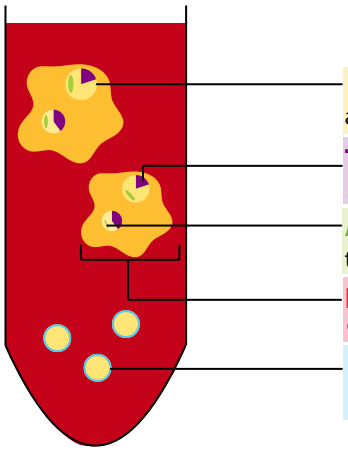
In people with established cardiovascular disease, CCS recommends levels **less than (indicated by " <"):**[5]



| | |
|---|---|
| **LDL cholesterol** (the "bad" cholesterol) – Builds up in artery walls and contributes to cardiovascular disease risk[4] | **1.8 mmol/L** |
| **Triglycerides** – High levels are linked to increased cardiovascular disease risk[4] | **1.5 mmol/L** |
| **Apolipoprotein B (ApoB)*** – Elevated levels are linked to higher risk of cardiovascular disease[7] | **0.7 g/L** |
| **Non-HDL-C*** – Elevated levels are a predictor of risk for cardiovascular disease[7] | **2.4 mmol/L** |
| **HDL cholesterol** (the "good" cholesterol) – Removes LDL cholesterol build-up from arteries, lowering cardiovascular disease risk[4] | |

*If triglyceride levels are above 1.5 mmol/L, healthcare providers may also consider two other types of lipid measurements linked to increased cardiovascular disease risk[5]: **Apolipoprotein B (ApoB)** and **non-HDL cholesterol levels.**

The following is recommended to measure at least once: **Lipoprotein(a):** High levels may increase the risk of heart attack or stroke.[1,5]

## 03 COMPLETE LIPID BLOODWORK BEFORE EACH VISIT

**Completing lipid bloodwork** before each visit allows healthcare providers to adjust treatments without delay. Depending on lipid panel results and other risk factors, treatment can range from **lifestyle changes** for lower risk individuals to **lipid lowering therapies** like **statins or biologics** for higher risk individuals.[5,6]

**Routine lipid testing after starting treatment allows healthcare providers to see the effectiveness of lifestyle changes or medication to manage cardiovascular disease.[2,5]**


1. HealthLink BC. Lipid Panel. HealthLink BC. Updated January 22, 2024.
2. Cleveland Clinic. Lipid Panel. Cleveland Clinic. Last reviewed December 9, 2024.
3. National Heart, Lung, and Blood Institute. Blood Cholesterol - Diagnosis. National Heart, Lung, and Blood Institute. Last reviewed April 18, 2024.
4. Ottawa Heart Institute. High Cholesterol. Ottawa Heart Institute.
5. Pearson GJ, Thanassoulis G, Anderson TJ, et al. 2021 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in Adults. *Can J Cardiol*. 2021 Aug;37(8):1129-1150. doi: 10.1016/j.cjca.2021.03.016.
6. Canadian Cardiovascular Society. FRAMINGHAM RISK SCORE (FRS) Estimation of 10-year Cardiovascular Disease (CVD) Risk. Canadian Cardiovascular Society; 2017.
7. Sniderman AD, Williams K, Contois JH, Monroe HM, McQueen MJ, de Graaf J, Furberg CD. A meta-analysis of low-density lipoprotein cholesterol, non-high-density lipoprotein cholesterol, and apolipoprotein B as markers of cardiovascular risk. Circ Cardiovasc Qual Outcomes. 2011 May;4(3):337-45. 9

# KNOW THE LDL THRESHOLD & FOLLOW THROUGH

**LDL THRESHOLD: 1.8 mmol/L OR LOWER**

## KEEPING TRACK OF LDL* LEVELS

THE CHART BELOW CAN BE USED TO TRACK LDL LEVELS OVER TIME AND COMPARE THEM TO THE LDL LEVELS TO AIM FOR.

| DATE | | | |
|---|---|---|---|
| LDL LEVEL (in mmoL/L) | | | |

## 01 KNOW LDL LEVELS, KNOW THE THRESHOLD

People who have had atherosclerotic cardiovascular disease, especially those who have had an event, are at high risk for another in the future.

**Cardiovascular events are health conditions caused by a blockage in the arteries related to a build-up of 'plaque' in the artery wall.**

Examples of such events include heart attacks, strokes, and peripheral vascular disease.[1,2]

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For people who have atherosclerotic cardiovascular disease, Canadian guidelines recommend their **LDL levels be below 1.8 mmol/L**.[1]


If the LDL level is not below this threshold, cardiovascular disease may get worse.[1]

## 02 WHY LOW LDL MATTERS

Lowering the LDL level can **stabilize or shrink plaques in the blood vessels that cause cardiovascular disease.**[3]

In addition to lifestyle modifications, lipid-lowering medications, like statins, are safe and effective at lowering LDL levels.[1]

If LDL levels remain above 1.8 mmol/L even with statins, additional lipid lowering therapies such as ezetimibe and PCSK9 inhibitors may need to be added.[1]

*LDL, low density lipoprotein cholesterol

Development of this infographic was directed by a group of Canadian cardiologists:
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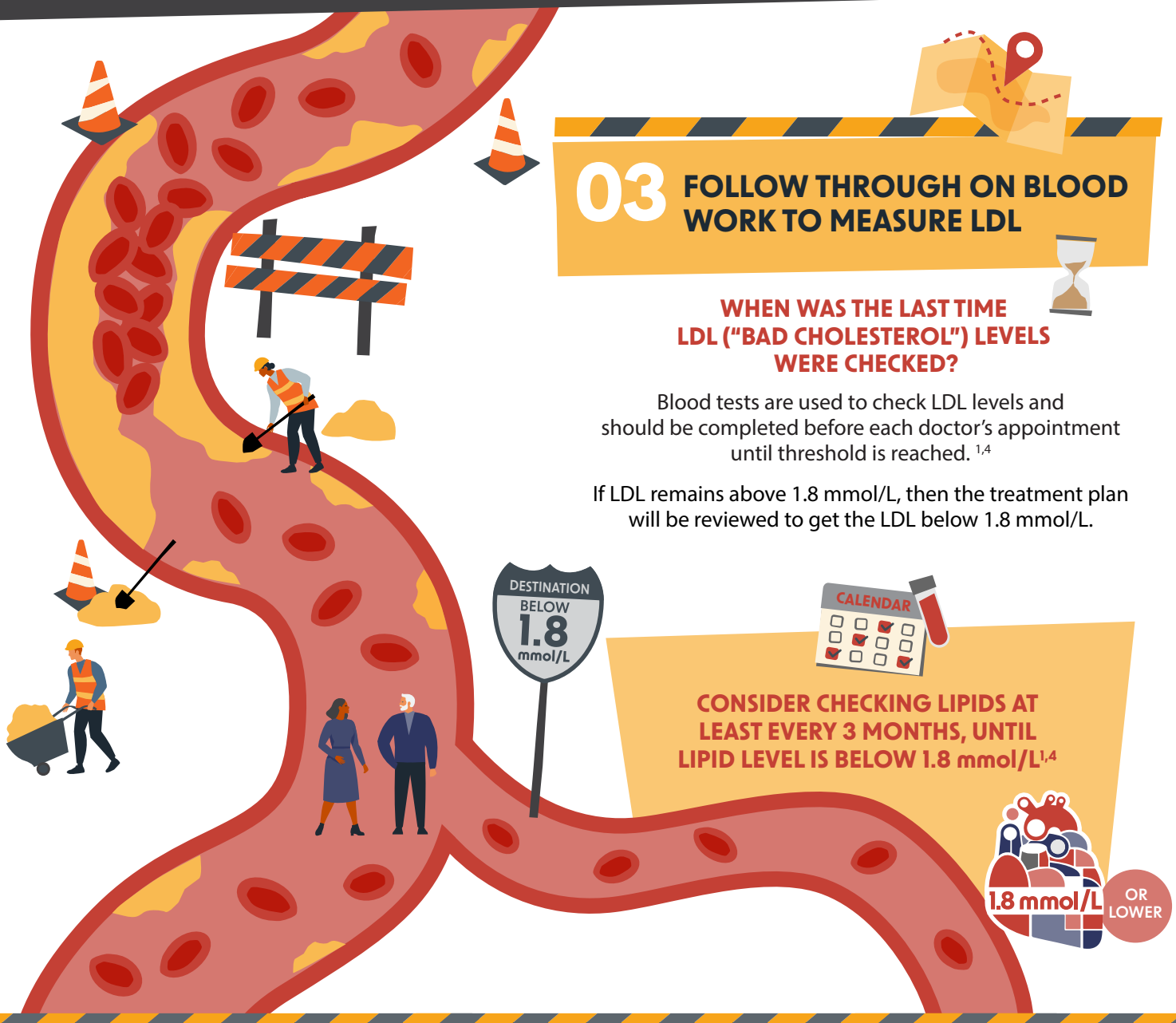
# KNOW THE LDL THRESHOLD & FOLLOW THROUGH




## 03 FOLLOW THROUGH ON BLOOD WORK TO MEASURE LDL

### WHEN WAS THE LAST TIME LDL ("BAD CHOLESTEROL") LEVELS WERE CHECKED?

Blood tests are used to check LDL levels and should be completed before each doctor's appointment until threshold is reached. [1,4]

If LDL remains above 1.8 mmol/L, then the treatment plan will be reviewed to get the LDL below 1.8 mmol/L.




**CONSIDER CHECKING LIPIDS AT LEAST EVERY 3 MONTHS, UNTIL LIPID LEVEL IS BELOW 1.8 mmol/L[1,4]**




**FOR MORE INFORMATION, CHECK OUT THESE RESOURCES**

### HEART HEALTHY DIET

There are many ways of eating that can help lower the cholesterol and risk of heart disease.

### CARDIORISK CALCULATOR™

Calculate cardiovascular risk[6]

### LIPIDLINK

Visualize how a plaque can lead to a cardiovascular event and learn about the effect of lowering LDL on plaques[7]

1. Pearson GJ, et al. Can J Cardiol. 2021;37:1129-1150. 2. World Health Organization. Cardiovascular diseases (CVDs). Accessed September 25, 2024. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds) 3. Nicholls SJ, et al. JACC Cardiovasc Imaging. 2022;15(7):1308-1321. 4. Mach F, et al. Eur Heart J. 2020;41:111-188. 5. Heart and Stroke. Specific Diets. Accessed January 7, 2025. https://www.heartandstroke.ca/healthy-living/healthy-eating/specific-diets 6. CIRCL. CardioRisk Calculator™. Accessed November 20, 2024. https://www.circl.ubc.ca/cardiorisk_webportal.html 7. Amgen. LipidLink. Accessed November 20, 2024. https://www.lipidlink.com/index.html

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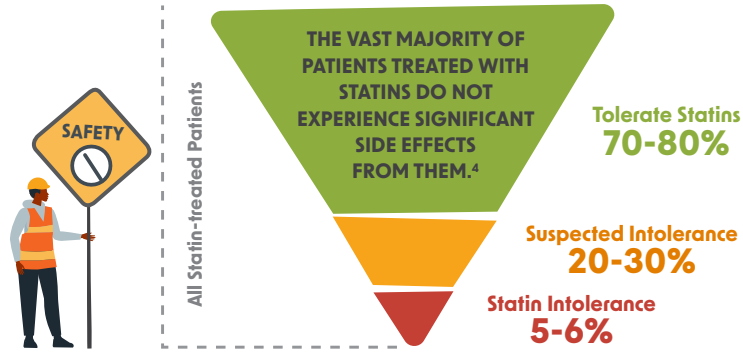
# WHAT IS STATIN INTOLERANCE?

## 01 MUSCLE PAIN CAUSED BY STATIN USE IS REAL, BUT UNCOMMON

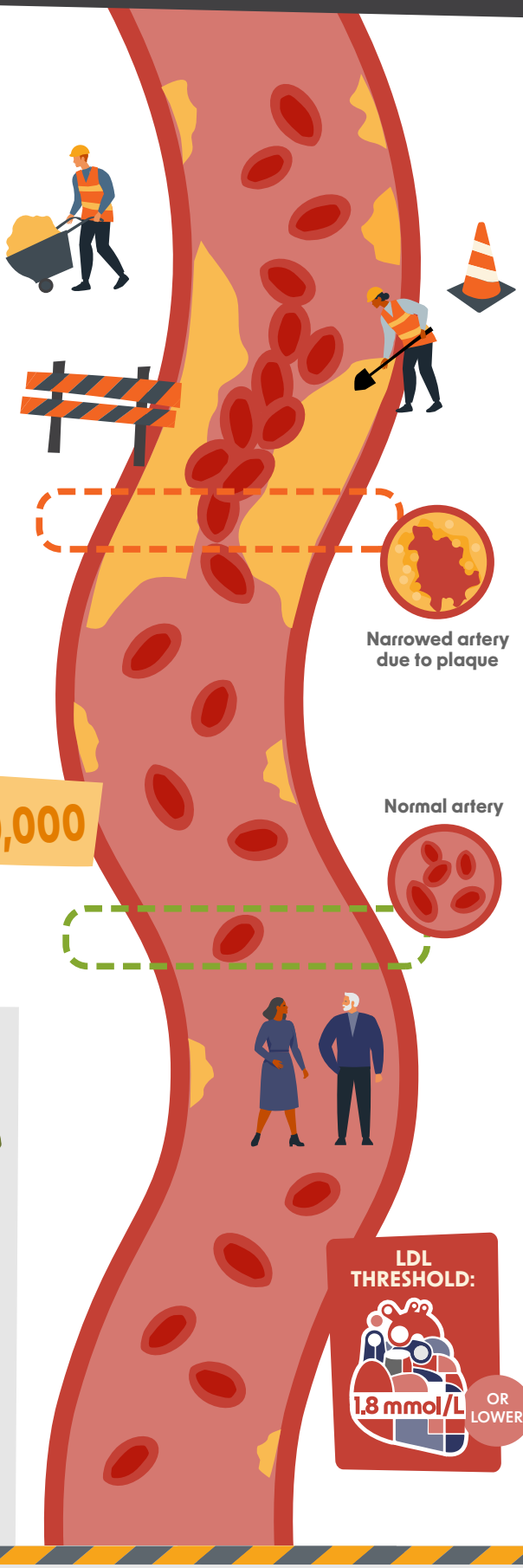
Statins are useful medications that healthcare providers recommend to reduce LDL ("bad cholesterol") levels in the blood, helping to reduce the risk of cardiovascular events, like a heart attack or stroke.[1,2]




Few people experience side effects with statins, but some become "statin intolerant", meaning they develop a side effect that prevents them from taking that dose of statin.[1,2]

These side effects are very rarely life threatening.[2] The most common symptom of statin intolerance are muscle aches, pains, weakness, or cramps, but it is extremely rare for serious muscle damage to occur (1 in every 100,000 people).[2,3]

For certain people, statin intolerance is more common (for example, some patients with untreated hypothyroidism, vitamin D deficiency may develop statin intolerance).[2]


## 02 ARE STATINS THE PROBLEM?

Many patients who **feel they have statin intolerance** may actually be experiencing a **'nocebo effect'.**[5,6]

A nocebo effect happens when people **expect harm from a treatment** and **experience symptoms,** but not from the treatment itself.[5,6]


LDL, low-density lipoprotein-cholesterol

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# WHAT IS STATIN INTOLERANCE?

CREATINE KINASE (CK) IS FOUND IN MUSCLES. ELEVATED LEVELS OF CK IN THE BLOOD CAN INDICATE MUSCLE INJURY OR INFLAMMATION. VERY HIGH CK LEVELS MAY ALSO LEAD TO MUSCLE ACHES.

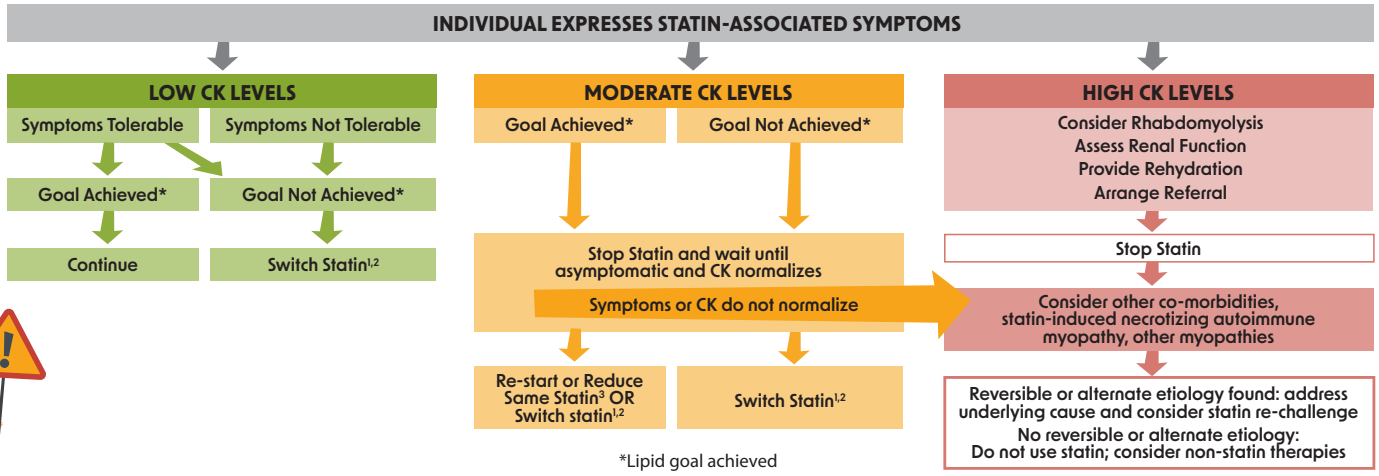
## 03 WHAT HEALTHCARE PROVIDERS CAN DO WITH THEIR PATIENTS


If an individual taking a statin experiences muscle pain, their doctor may recommend a "statin rechallenge" strategy, where the patient may stop the statin for a few weeks.[2,7]

If symptoms resolve, the doctor will restart the statin to see if the symptoms return.[2,7]

If the symptoms come back, the doctor may change medications to manage these symptoms, while continuing other treatments to reduce the risk of cardiovascular events.[2,7]

### APPROACH TO STATIN-ASSOCIATED MUSCLE AND OTHER STATIN-ASSOCIATED SYMPTOMS[5]




*Lipid goal achieved

[1]Repeat algorithm once and if goals are not achieved, Goal-inhibiting Statin Intolerance warrants use of non-statin adjuncts
[2]Consider use of readily available non-statin (eg, ezetimibe) at any time during process particularly to avoid protracted non-treatment of lipid-related risk in high CV risk individuals
[3]Repeat algorithm to determine if problem reoccurs, if unsuccessful, switch to a different statin and repeat algorithm

### AT ALL TIMES HEALTHCARE PROVIDERS WILL:

**CONSIDER** individuals' priorities, level of risk and indication for therapy, understanding about CV risk reduction, new co-morbidities or new drug-drug interactions

**MONITOR** individuals' symptoms, quality of life, adherence, and efficacy in achieving goal with medication and lifestyle interventions

**IDENTIFY AND MODIFY** risk factors (hypothyroidism, impaired renal or hepatic function, vitamin D deficiency, inflammatory condition, elevated baseline CK levels etc)

**CONSIDER** use of other testing (eg, liver function tests, vitamin D, CRP, TSH etc)

**CONSIDER** non-statins requiring special access procedures if Goal-inhibiting Statin Intolerance is documented

## 04 WHAT PATIENTS CAN DO

If patients experience muscle pain while on statins, they should inform their doctor, who may order investigations, but they should not stop taking the statin.

Continued statin use is important to reduce the risk of cardiovascular events, like a heart attack.[2]

**EXPECTED LDL REDUCTION WITH[8,9]:**

**LIFESTYLE**
**2-12%**
A healthy lifestyle is essential but not enough if you have heart disese, diabetes, or extremely high LDL-cholesterol

**MODERATE-INTENSITY STATIN**
**30-49%**
This level of reduction can help achieve the lower LDL levels recommended for people with diabetes

**HIGH-INTENSITY STATIN**
**50%**
This level of reduction can help achieve the lower LDL levels recommended for people with heart disease or extremely high LDL


1. Mancini GBJ, et al. Can J Cardiol. 2016;32(7 Suppl):S35-65. 2. Fitchett DH, et al. Circulation. 2015;131(13):e389-e391. 3. Law M, et al. Am J Cardiol. 2006;97:52C-60C.
4. NPS MedicineWise. Statin-associated muscle symptoms. Accessed November 28, 2024.
https://www.nps.org.au/professionals/managing-lipids/statin-associated-muscle-symptoms-sams 5. Iatan I, et al. Exp Rev Cardiovasc Ther. 2023;21(6):423-435.
6. Krishnamurthy A, et al. Curr Cardiol Rep. 2022;24:1101-1108. 7. Gaine SP, et al. NLA 2022 Definition of Statin Intolerance. Accessed November 28, 2024.
https://www.acc.org/Latest-in-Cardiology/Articles/2022/08/08/12/27/NLA-2022-Definition-of-Statin-Intolerance 8. National Association of Community Health Centers.
Accessed November 28, 2024. https://millionhearts.hhs.gov/files/Statin-Infographic-508.pdf 9. Grundy SM, et al. Circulation. 2019;139(25):e1082-e1143.

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# HOW LOW SHOULD PATIENTS WITH A PRIOR CARDIOVASCULAR EVENT GO

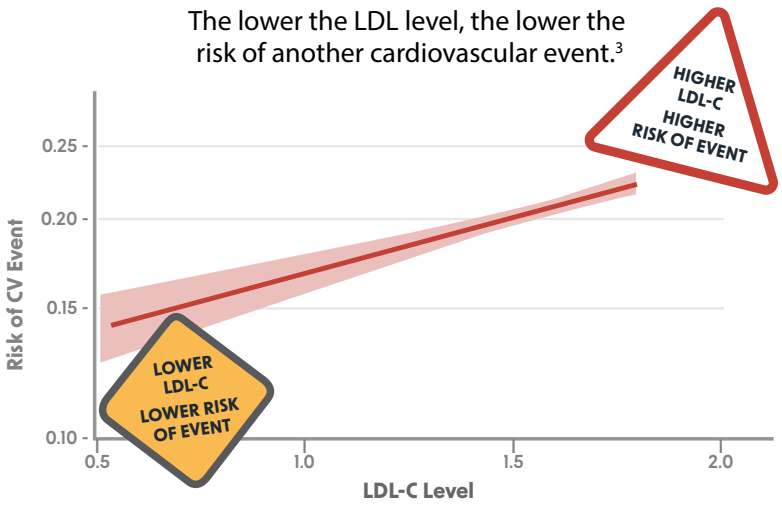
## LDL LEVELS THAT PATIENTS SHOULD AIM FOR

## 01 PEOPLE WHO HAVE HAD A CARDIOVASCULAR EVENT ARE AT A HIGHER RISK OF ANOTHER EVENT

**High LDL ("bad cholesterol") levels increase the risk of having another cardiovascular event,** like a heart attack or stroke.[1,2]

To reduce the risk, it is important to keep LDL levels under control.[1]

The lower the LDL level, the lower the risk of another cardiovascular event.[3]




**FOR EVERY 1-POINT DECREASE IN LDL, THE RISK OF A CARDIOVASCULAR EVENT DECREASES BY ALMOST 25%.[3]**

## 02 PEOPLE WHO HAVE HAD A CARDIOVASCULAR EVENT SHOULD AIM FOR AN LDL BELOW 1.8 mmol/L

For people who have cardiovascular disease, Canadian guidelines recommend LDL levels below 1.8 mmol/L.[1]

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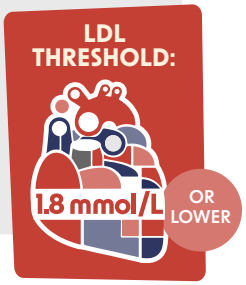


LDL, low density lipoprotein cholesterol

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# HOW LOW SHOULD PATIENTS WITH A PRIOR CARDIOVASCULAR EVENT GO

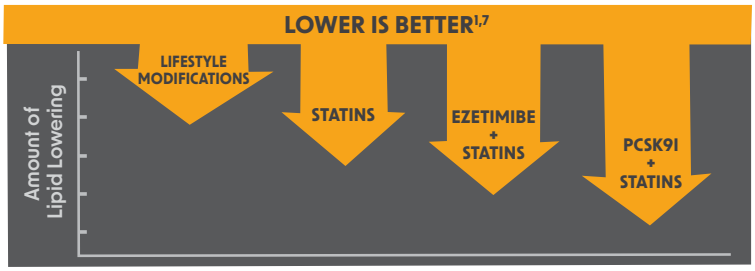
## LDL LEVELS THAT PATIENTS SHOULD AIM FOR

## 03 THE SOONER THE BETTER, THE LOWER THE BETTER


The longer an individual has high LDL levels, the higher their risk of another cardiovascular event.[4]

Canadian guidelines recommend lifestyle modifications, like dietary changes or increasing physical activity, to help lower LDL levels.[1]

The guidelines also recommend lipid-lowering medications like statins, ezetimibe, and PCSK9 inhibitors, which can work faster than lifestyle modifications alone to reduce LDL and keep it low.[1]

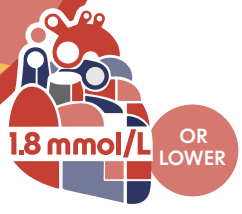



Having a very low LDL level is safe.[5,6]

FOR EXAMPLE, EVEN THOUGH THE BRAIN IS MADE UP OF HIGH AMOUNTS OF CHOLESTEROL, THERE IS NO CONNECTION BETWEEN LOW LDL LEVELS IN THE BLOOD AND BRAIN HEALTH. THE BRAIN MAKES ITS OWN SUPPLY OF LDL.[6]

## 04 WHAT PATIENTS WHO HAVE HAD A CARDIOVASCULAR EVENT CAN DO WITH THEIR HEALTH TEAMS






1. Pearson GJ, et al. Can J Cardiol. 2021;37:1129-1150. 2. World Health Organization. Cardiovascular diseases (CVDs). Accessed September 25, 2024. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds) 3. Sabatine MS, et al. JAMA Cardiol. 2018;3(9):823-828. 4. Ference et al. J Am Coll Cardiol. 2018;72(10):1141-1156. 5. Sabatine MS, et al. JAMA Cardiol. 2018;3(9):823-828. 6. Goldstein LB, et al. Arterioscler Thromb Vasc Biol. 2023;43(10):e404-e442. 7. Mackinnon ES et al. Cardiol Ther. 2023;12:327-338.

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