Summary of Key Recommendations

Nutrition Recommendations to Improve Heart Health

Fat

Recommend total fat intake of 25–35% energy in order to avoid excess intake of carbohydrates, particularly from refined starches and added sugars.

Saturated Fat

Foods high in saturated fat are associated with higher serum low-density lipoproteins (LDL) levels, which increase cardiovascular (CV) risk. Recommend reducing saturated fat to 9% or less total energy for CV health.

Monounsaturated Fat

A diet high in monounsaturated fat can reduce serum LDL and slightly increase serum high-density lipoproteins (HDL).

Omega-3 Fat

Marine sources may reduce CV risk; however, these same benefits are not seen in supplement form.

Carbohydrates

Recommend patients consume <5% energy from added sugar, and not exceed 10%.

Fibre

Recommend consuming at least 30 g total fibre daily to lower CV risk and 10 g soluble fibre daily can help to lower total cholesterol and LDL.

Dietary Patterns

The Mediterranean, Dietary Approaches to Stop Hypertension (DASH), portfolio, and Nordic diets are recommended to support heart health.

Lifestyle Recommendations to Improve Heart Health

Alcohol

It is recommended that those, with or at risk for CV disease, limit their intake of alcohol to a maximum of 2 drinks/day.

Weight

For patients living with obesity, weight loss of 5–10% from baseline weight and reducing waist circumference may improve the lipid profile and reduce CV risk.

Physical Activity

Improvements in the lipid profile are observed with aerobic and resistance activities.

Smoking Cessation

Smoking cessation can greatly reduce CV risk and improve the lipid profile over time.

Nutrition and Lifestyle Interventions to Improve HDL, LDL, and Triglycerides

Refer to Point of Care Reference: Improving the Lipid Panel for a summary of nutrients, dietary patterns, and lifestyle modifications that can be targeted to improve HDL, LDL, high triglycerides, and very high triglycerides (TGs).

Introduction

The purpose of the Heart Health Nutrition Guideline is to provide health professionals with an overview of the evidence-based nutrition recommendations for adults with dyslipidemia, increased heart disease risk or cardiovascular conditions, and to provide answers to commonly asked questions (See Key Questions List).

Following the recommendations in the Nutrition Guideline can help to:[1,2]

- Reduce CV disease risk
- Improve serum lipid levels including LDL, HDL, and TGs:

The Nutrition Guideline was developed by registered dietitians (RD) from the Cardiovascular Care Nutrition Practice Working Group and is based on scientific evidence and best practice. It was reviewed by stakeholders across the province. If you have questions about this Nutrition Guideline, please contact: Nutrition_Resources@ahs.ca

This information is intended as a general resource only and is not meant to replace the medical counsel of a physician or individual consultation with an RD. It is the responsibility of health professionals to evaluate the situation of each patient in their care, and apply the Nutrition Guideline appropriately. Individuals who are at high risk of malnutrition or who have a medical condition that is impacted by nutrition should be referred to an RD.

Referral to a Registered Dietitian

For more information on referral to an RD and RD services available in Alberta Health Services (AHS):

- See Nutrition Guideline: Referral to a Registered Dietitian.
- Visit Referring Patients for Nutrition Services

Note: For purposes of this Nutrition Guideline, the single term patient will be used to refer to clients, patients, and residents.

Nutrition Guideline

Heart Health

Key Questions List

Key nutrition questions related to heart health addressed in this Nutrition Guideline are listed below.

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- What are polyphenols and how do they improve heart health?
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Answers to Key Questions

Definitions   **Return to Key Questions List**

What are frequently used terms in cardiovascular care?

Cardiovascular Disease: Includes diseases or injuries within the heart and the system of blood vessels throughout the heart, brain, and body.[3] Cardiovascular disease encompasses both heart disease and cerebrovascular disease.

Heart Disease: Disease that affects the structure or function of the heart. Includes, but is not limited to:

- Angina
- Atherosclerosis
- Myocardial infarction
- Valve disorders
- Heart failure
- Endocarditis
- Pericarditis

Cerebrovascular Disease: Disease specific to blood vessels that carry blood within the brain. Includes ischemic and hemorrhagic strokes.

Dyslipidemia: Abnormal amounts of serum triglycerides and cholesterol. Is a risk factor for CV disease.

Triglyceride: Fats that circulate in the blood and differ in length and saturation:

- Long, medium, and short chain
- Saturated and unsaturated

Cholesterol: A waxy substance made in the liver that is insoluble in the blood, essential for building cells and producing hormones and vitamins, transported around the body by lipoproteins. Too much cholesterol can increase the risk for CV disease.

Lipoproteins: A group of proteins that transport lipids (cholesterol and triglycerides) in the blood.

Low-Density Lipoproteins (LDL): Responsible for depositing cholesterol in the cells and tissues. High levels of LDL lead to plaque deposits that narrow or block blood vessels and harden arteries, increasing the risk of CV disease.[4]

High-Density Lipoproteins (HDL): HDL removes cholesterol from the tissues and transports it back to the liver. Higher levels of HDL are associated with a lower risk of CV disease.

Atherosclerosis: Condition in which the arterial walls build up with cholesterol plaque and lead to narrowing of the bloodstream. Depending on the location of arterial damage, atherosclerosis can increase the risk for coronary and peripheral artery disease, stroke, and kidney disease.

Hypertriglyceridemia: A condition of elevated serum triglycerides. Associated with increased CV risk and pancreatitis.

Risk Factors and Screening

What are the risk factors for cardiovascular disease?

The following tables review modifiable risk factors (Table 1) and non-modifiable risk factors (Table 2) for CV disease.

Table 1. Modifiable Risk Factors for Cardiovascular Disease[1]

Risk Factor	Description
Dyslipidemia	• Improving serum lipids (e.g., total cholesterol, LDL, HDL and triglycerides) helps lower CV risk. • Refer to Practice Support Tool for more details.
Low Intake of Fruits and Vegetables	• Consuming ≥5 servings/day of vegetables and fruits is associated with reduced CV risk and CV mortality. • Refer to Dietary Patterns for more details.
Excess Adipose Tissue	• Reducing excess fat stores is shown to significantly lower CV risk, LDL, triglycerides, and raise HDL.[1,3] • Refer to Weight for more details.
Physical Inactivity	• Physical activity helps improve heart health by lowering cholesterol, blood pressure, blood glucose, and raising HDL. • Refer to Physical Activity for more details.
Elevated Blood Pressure	• Keeping blood pressure targets within a range based on age and other comorbidities can help to lower CV risk. • Refer to Nutrition Guideline: Hypertension for more details.
Smoking	• CV risk associated with smoking decreases soon after cessation and may continue to decrease over time. • Refer to Smoking Cessation for more details.

Table 2. Non-Modifiable Risk Factors for Cardiovascular Disease[5]

Risk Factor	Description
Age	• >40 years
Sex	• Female postmenopause
Ethnicity	• Indigenous peoples and people of South Asian and African descent are more likely to have hypertension and dyslipidemia; and therefore, are at increased CV risk.

Family History	• Premature CV disease is considered a CV event at:
	  ○ ≤55 years in males
	  ○ ≤65 years in females
	• Premature CV disease in a first-degree relative (i.e., a parent or sibling) increases CV disease risk.

How do you assess an individual's cardiovascular risk?

The Canadian Cardiovascular Society recommends a CV risk assessment every 5 years in individuals aged 40–75 years. The recommended assessment is the Framingham Risk Score (FRS).[1] The FRS is used to determine the risk of having a major CV event in the next 10 years (e.g., high, intermediate and low risk).[3] A modified FRS score is calculated when a patient has a first-degree relative with premature CV disease as this doubles the individual's CV risk.[1]

For more information on risk assessment, refer to the [Canadian Cardiovascular Society](#).

Total Fat   Return to **Key Questions List**

How much dietary fat is recommended for heart health?

Recommendations for total fat in CV health are similar to those recommended for general health. In CV health a total fat intake of 25–35% energy is recommended in order to avoid excess intake of carbohydrates, particularly from refined starches and added sugars.[6]

In addition to the amount of fat, there is a focus on the type of fat. It's recommended patients consume more monounsaturated and polyunsaturated fats from plant-based foods, fish or marine sources, compared to saturated fats from animal-based sources or tropical oils (coconut and palm).

Saturated Fat   Return to **Key Questions List**

Does saturated fat affect heart health?

Diets high in saturated fat are associated with higher serum LDL levels which are the leading cause of atherosclerosis and increased CV risk.[7,8] Research shows that not all sources of saturated fat have the same effect on heart health; however, benefits are seen in all adults who reduce their intake of foods high in saturated fat.[7]

For CV health, it is recommended to aim for 9% total energy from saturated fat or less.[1,7] For example, a patient eating 2000 kcal/day would aim for 20 g/day saturated fat or less. Some patients with atherosclerotic CV disease, a serum LDL >4.9 mmol/L, or increased FRS may consider reducing saturated fat intake as low as 5–6% total energy or ≤13 g/day on a 2000 kcal/day diet.[9]

What are sources of saturated fat?

See Table 3 for a list of foods high in saturated fat.

Table 3. Common Foods High in Saturated Fat[10]

Food	Portion Size	Saturated Fat
Coconut oil	1 Tbsp (15 mL)	11.9 g
Ice cream (16% M.F.)	½ cup (125 mL)	11.7 g
Bacon	2.5 oz (75 g)	10.6 g
Salami	2.5 oz (75 g)	9.8 g
Hard cheese (33% M.F.)	1.5 oz (50 g)	9.7 g
Ghee or clarified butter	1 Tbsp (15 mL)	8.6 g
Butter	1 Tbsp (15 mL)	7.4 g
Ground beef, regular	2.5 oz (75 g)	7.0 g
Hot dog	2.5 oz (75 g)	5.1 g
Beef ribs	2.5 oz (75 g)	4.7 g
Chicken wings with skin	2.5 oz (75 g)	4.5 g
Coffee cream (18% M.F.)	2 Tbsp (30 mL)	3.4 g
Milk (2% M.F.)	1 cup (250 mL)	3.2 g
Pork chop	2.5 oz (75 g)	2.6 g
Steak, beef tenderloin	2.5 oz (75 g)	2.4 g
Ham	2.5 oz (75 g)	2.0 g

% M.F. = % Milk Fat

How can patients reduce their intake of saturated fat?

It is recommended to reduce foods high in saturated fat and replace them with:
- Foods high in monounsaturated and polyunsaturated fat
- Foods high in fibre[1,7,11–13]

See the list below for heart healthy choices to replace foods high in saturated fat.
- Lean animal meats with minimal visible fat
- Fish and shellfish
- Eggs and egg whites
- Plant proteins like tofu, beans, lentils, hummus, and edamame
- Chicken and turkey breast or ground poultry
- Low-fat dairy products like skim or 1% M.F., yogurt, milk, and kefir.
- Liquid oils like olive, avocado, canola, and sunflower
- Soft margarine (vegetable oil margarine low in saturated fat)
- Nuts and seeds (e.g., flax, chia, walnuts, almonds, pumpkin, peanut, pistachio, and hemp)
- Avocados (guacamole) and olives (tapenade)

When purchasing packaged foods, patients can use the Nutrition Facts table and ingredient list to choose foods with <15% daily value from saturated fat per serving.

How do different types of meat and processed meat affect heart health?

Type of Meat

- Certain cuts of meat with visible fat including ribs, T-bone steaks, chicken wings, pork chops, and regular ground meat contain high amounts of saturated fat (4–11 g/serving).[10] These higher fat cuts of meat are shown to increase CV risk.[14,15] It is recommended to reduce the frequency and portion size of high fat and visibly marbled meat.

- Lean cuts of meat such as tenderloin, sirloin, chicken breast, pork loin, and extra-lean ground meat contain much less saturated fat (0.4–3.6 g/serving).[10] In addition, many types of wild meat such as moose, deer, and elk are very low in saturated fat. These lean cuts of meat have no association with CV risk.[14,15]

Processed Meat

- Includes bacon, ham, sausage, salami, deli meat, and luncheon meats. These foods are high in saturated fat, sodium, and other additives such as nitrates and nitrites. Added nitrates promote endothelial dysfunction and atherosclerotic development.[14,16] Consuming 50–100 g/day processed meat increases cancer and CV risk.[14–16] Recommend patients avoid or limit all processed meat.

How does dairy fat affect heart health?

Dairy fat can be a major source of saturated fat; however, it does not seem to have the same negative CV effects as other sources of saturated fat. Despite this, it is still recommended to limit the intake of higher fat dairy products (e.g., milk of >2% M.F., cheese >20% M.F., cottage cheese >2% M.F.). Higher fat dairy products may also be replaced with lower fat dairy products (e.g., skim to 1% milk, yogurt, or kefir), or unsaturated fats like vegetable oils and fortified plant-based beverages.

Is ghee or clarified butter recommended for heart health?

Ghee is a type of clarified butter where the water and milk solids are removed making it more concentrated in fat.[10] There is minimal difference in nutritional composition between butter and ghee; therefore, it's recommended to limit both.[10,17]

- Ghee: 1 Tbsp. (15 mL): 13.9 g total fat, 8.7 g saturated fat
- Butter: 1 Tbsp. (15 mL): 11.7 g total fat, 7.4 g saturated fat

Vegetable oils are a better heart healthy alternative to animal sources of fat-containing high saturated fatty acids.

Considerations

Patients with dairy allergy or sensitivity:

- There may be a benefit in using ghee over butter for individuals with an allergy or sensitivity to dairy proteins or sugars. Ghee is completely free from milk sugar (lactose) and milk protein (casein); whereas butter may contain small fractions of each of these.

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Is butter or margarine recommended for heart health?

It is important to consider the amount of saturated fat when comparing butter and margarine. Butter is high in saturated fat, which is associated with elevated LDL levels. Margarine varies in the amount of saturated fat. The hard margarines often contain more saturated fat than soft tub margarines.

Previously, hard margarines also had high levels of trans fats which both increased LDL and lowered HDL, proving detrimental to heart health. Since Health Canada's Ban on Artificial Trans Fats (September 2018), all margarines now contain insignificant amounts of trans fat and can be lower in saturated fat.

Recommend patients check the Nutrition Facts table and select a spread that is low in saturated fat for heart health. The ingredient list will also list the percent (%) of vegetable oil; those with higher % vegetable oils are often lower in saturated fat.

For more information on reading food labels, refer to Nutrition Guideline: Label Reading.

Considerations

Trans fat in the food supply:

Despite Health Canada's Ban on Artificial Trans Fats, patients will continue to see trace amounts of trans fats in the food supply, mainly from the following sources:

- Natural trans fat: foods that naturally contain trans fat include dairy products, beef, lamb and some oils. These trans fat are different from artificially created trans fat and are not considered hazardous to heart health.
- Fully hydrogenated oils, including hydrogenated palm oil or hydrogenated kernel oil. These contain very low amounts of trans fat, similar to that of liquid vegetable oils.

Does coconut oil affect heart health?

Coconut oil is high in saturated fat which is associated with increased serum LDL levels. One tablespoon (14 g) coconut oil contains 12 g saturated fat, which is a significant contribution to the daily saturated fat quota.[10] Although there are signs that coconut oil can increase serum HDL it is not recommended over vegetable oils due to the adverse effects it has on LDL.

Medium Chain Triglycerides   Return to Key Questions List

What are medium chain triglycerides and how do they affect heart health?

Medium chain triglycerides (MCT) have a unique way of being digested and absorbed that differs from other types of dietary fats. Compared to long-chain fatty acids, MCTs are directly transported to the bloodstream from the intestine.[18] MCTs occur naturally in some foods, but the primary use of MCTs is in manufactured supplements or functional foods. MCTs do not contain the essential fatty acids omega-3 and -6; therefore, cannot replace all sources of healthy fats.

The effect of MCTs on serum lipid profiles continues to be disputed; therefore, more research is needed.

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Considerations

Patients with digestive or absorptive diseases:

- Due to the ability of MCT fatty acids to bypass stimulation of the liver, gallbladder, and pancreas, they are often used for clinical conditions like pancreatitis, reduced pancreatic enzyme release, reduced bile salt production, overproduction of chylomicrons, or in people with severe malabsorption.

Unsaturated Fat   Return to **Key Questions List**

What are sources of monounsaturated fats and how do they improve heart health?

Foods high in monounsaturated fats are summarized in Table 4. A diet rich in monounsaturated fat can improve the lipid profile by reducing LDL and slightly increasing HDL.[19,20] Encourage patients to replace saturated fat with monounsaturated fat to reduce CV risk.

Table 4. Food Sources of Monounsaturated Fat

Source	Description
Olive Oil	- Extra virgin and virgin olive oil contain added nutrients including vitamin E, polyphenols, and phytosterols which may have CV benefits.[21] - Regular or light olive oil is the most processed (refined with heat or chemicals) which results in the loss of beneficial compounds.
Nuts	- Tree nuts (e.g., walnuts, almonds, and pistachios) have a favourable impact on lowering LDL and triglycerides, improving heart health, and lowering inflammation.[1,9,22–26] - Nuts are a source of fibre, unsaturated fats, protein, vitamins, and minerals. - Encourage 30 g (1/4 cup) daily.
Canola Oil	- Canola oil is a rich source of monounsaturated fat known to support CV health, especially when substituted for foods high in saturated fat.[27]

What are sources of omega-3 fats and how do they improve heart health?

There are three main types of omega-3 fats described in Table 5.
- Alpha-linolenic acid (ALA)
- Eicosapentaenoic acid (EPA)
- Docosahexaenoic acid (DHA)

Table 5. Potential Health Benefits of Omega-3 Fats[28]

Type of Omega-3	Sources	Potential Health Benefits
ALA	• Vegetable oils (e.g., canola, soybean) • Flaxseed • Chia seed • Walnuts	• Encourage these foods for heart health, although the evidence for reducing CV risk is seen more with an intake of long-chain omega-3 fats.
EPA and DHA	• Fatty fish (e.g., salmon, trout, mackerel, herring, sardines) • Marine food sources (e.g., kelp and seaweed)	• Reduce CV risk • Reduce blood pressure • Keep arteries supple • Prevent blood clots • Lower triglycerides

Considerations

Supplementation:

- The use of over-the-counter omega-3 supplements is not recommended to reduce CV risk.[5]

Hypertriglyceridemia:

- High dose (2–4 g/day) omega-3 EPA and DHA supplementation may be used to treat very high triglycerides. First review supplementation with physician and medical team for any adverse interactions.[5]

Pregnancy:

- Individuals who are pregnant are advised to include at least 150 g (5 oz) cooked fish rich in omega-3 fatty acids and low in mercury each week.
- Pregnant individuals are advised to restrict their consumption of flaxseed to the amounts commonly found in foods and to avoid flaxseed oil.
- For more information, refer to Nutrition Guideline: Pregnancy.

Icosapent ethyl (IPE):[5,29]

- A daily dose of 4g IPE (e.g., Vascepa®), a prescription form of EPA, has been shown to reduce major CV events in statin-treated patients with hypertriglyceridemia and established CV disease or diabetes and at least one CV disease risk factor.[5]
- Despite this medication being approved by Health Canada, providers are encouraged to discuss potential coverage issues and high costs with patients.

What are sources of omega-6 fats and how do they impact heart health?

Omega-6 fats are found in a variety of foods including:

- Nuts and seeds: walnuts, sunflower, safflower, sesame, pumpkin seeds and their oils
- Soybeans, soy nuts, and soybean oil
- Corn and corn oil
- Meat, poultry, fish, and eggs

Omega-6 fats are healthy unsaturated fats like omega-3 fats. However, omega-3 fats help reduce inflammation while omega-6 fats can increase inflammation. There are no recommendations for omega-6 fats and heart health.

Dietary Cholesterol   Return to **Key Questions List**

Does dietary cholesterol impact heart health?

There is no evidence to support limiting dietary cholesterol in the general population for heart health.

A high intake of cholesterol is considered 500–900 mg/day cholesterol from foods such as meats, poultry, shellfish, egg yolks, and milk products.[9,28,30,31] This intake is not associated with increased CV risk; however, some individuals may respond differently to dietary cholesterol. Those individuals with a history of CV disease identified as having elevated lipids and a high intake of cholesterol-rich foods may benefit from reducing cholesterol to 200 mg/day or less to lower secondary CV event risk.[32]

Carbohydrates   Return to **Key Questions List**

How do added sugars affect heart health?

Sugars can be naturally occurring or added. Naturally occurring sugars are found in foods such as fruit and dairy. Added sugars are sugars and syrups put in foods during preparation, processing or at the table.

Consuming higher levels of added sugar is associated with adverse health effects like excess abdominal fat, cancer, dental caries, type 2 diabetes, dyslipidemia, hypertension, and CV disease.[4,33–35] A diet high in added sugar is considered 10–25% energy from sugar or 50–125 g sugar/day. Refer to Table 6 for a list of foods high in added sugar.

Table 6. Foods High in Added Sugar[10,36]

Food	Portion Size	Added Sugar
Frappuccino, vanilla	16 oz (473 mL)	69 g
Energy drink	1 can (355 mL)	41 g
Carbonated drink, cola	1 can (355 mL)	40 g
Muffin, blueberry	1 medium (110 g)	35 g
Fruit flavoured yogurt	¾ cup (175 mL)	23 g
Fruit beverage	½ cup (125 mL)	18 g
Ice cream	½ cup (125 mL)	15 g
Granola	½ cup (125 mL)	14 g
Instant oatmeal, flavoured	¾ cup (175 mL)	13 g
Cookie, chocolate chip	1 cookie (40 g)	13 g
Cereal, cold	~½ cup (30 g)	10 g
Granola bar	1 bar (35 g)	9.5 g

What are the recommendations for added sugar?

Encourage patients to consume less than 5% energy from added sugar, and to not exceed 10%.[35,37] For example, a 2000-calorie diet would aim for less than 25 g/day added sugar and no more than 50 g/day.

Considerations

Patients living with diabetes:

- For more information on added sugar and diabetes, refer to Nutrition Guidelines: Adult Diabetes and Adult Prediabetes.

Is a restricted carbohydrate diet recommended for heart health?

Consuming a moderately restricted carbohydrate diet is associated with improved HDL and reduced triglycerides in people with overweight or obesity.[38] A moderately restricted carbohydrate diet is defined as <45% energy from carbohydrates. This would be less than 225 g carbohydrates/day on a 2000-calorie diet.[38]

A very low carbohydrate diet (<10% carbohydrates, or <50 g/day), such as ketogenic diets, may result in a reduced intake of fibre and micronutrients.

If a patient is following a restricted carbohydrate diet, a referral to an RD is recommended.

For more information on restricted carbohydrate diets, refer to Nutrition Guideline: Restricted Carbohydrate Diet.

Fibre

Is fibre important for heart health?

A higher fibre intake is beneficial to heart health and associated with:

- Improved triglycerides
- Reduced total cholesterol and serum LDL
- Reduced risk of heart disease, stroke, hypertension, diabetes, obesity, certain gastrointestinal disorders, all-cause mortality, and CV mortality

How can patients eat more fibre?

To lower CV risk, it is recommended to consume at least 30 g/day of fibre.[1] When reading a label, aim for 4–5 g of fibre per serving (or 15% daily value) and choose fibre-rich foods at each meal. Fibre-rich foods include whole grains, fruit, vegetables, legumes, nuts, and seeds.

Recommend patients:

- Gradually increase their fibre each week to reduce the risk of gastrointestinal side effects.[39]
- Try to include 5 g fibre daily more for 1 week before increasing fibre intake again.[40]

How does soluble fibre help lower serum LDL?

Sources of soluble fibre are those that dissolve in water and form a gel-like substance. Soluble fibre binds to bile acids. As fibre is not absorbed into the body and remains in the intestine, this soluble fibre brings the bile into the stool. This helps lower total cholesterol and LDL in individuals with and without dyslipidemia.[3,40,41]

Individuals with and without dyslipidemia are recommended to consume 10 g soluble fibre each day to lower serum LDL.[3,42] Examples of foods rich in soluble fibre include konjac noodles, bran cereal with psyllium, legumes, pears, dried figs, and ground flaxseed.

Dietary Patterns

What dietary patterns support heart health?

Table 7 details the dietary patterns shown to improve CV outcomes such as increasing HDL, lowering LDL, and reducing CV risk.[1,43–48]

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Table 7. Heart Health Dietary Patterns

Dietary Pattern	Description	Effect on CV Risk
Mediterranean Diet	Emphasizes plant-based foods such as vegetables, beans, whole grains, fruits, nuts and seeds, and plant-based oils, especially olive oil.	Reduces waist circumference, triglycerides, and blood pressure, and increases serum HDL.[44,48] Reduces major CV events including myocardial infarction, stroke and CV mortality.[1,21,26,48,49]
Dietary Approaches to Stop Hypertension (DASH)	Promotes vegetables, fruits, low-fat dairy products, whole grains, and plant-based proteins low in saturated fat.[1,3,50] Suggests reducing intake of added sugar and limiting sodium to 1500–2300 mg/day.	The combination of lipid-lowering and blood pressure management helps reduce CV risk.[1]
Portfolio Diet	A modified vegetarian diet that emphasizes 4 pillars of food, shown to improve CV risk on their own and in combination with each other.[1,43,45,46,51,52] • Nuts • Plant protein • Plant sterols • Soluble viscous fibre	Each pillar lowers serum LDL by 5–10% on its own, and when combined and adhered to for one month, can lower LDL by 29% and reduce the Framingham Risk Score by 25%.
Nordic Diet	Reflects foods consumed in Nordic countries. Diet is low in sodium, sugar, and saturated fat.[47] Emphasizes whole grains, temperate fruits, legumes, vegetables, canola oil, fatty fish, low-fat dairy products, nuts, soluble fibre, and plant-based protein.	Improved serum lipids, blood pressure and inflammation.[53]

Considerations

Patients with chronic kidney disease (CKD):

- Dietary patterns rich in vegetables and fruit, whole grains and beans and lentils are also high in potassium and phosphorus. The higher intake of foods rich in potassium and phosphorus may be contraindicated in patients with CKD.
- For information on CKD and dietary patterns, refer to Nutrition Guideline: Renal.

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Antioxidant Rich Foods

Return to Key Questions List

What are polyphenols and how do they improve heart health?

Polyphenols are a large group of beneficial compounds found in plants. They include beta-carotene, vitamin C, vitamin E, selenium, and flavonoids. See Table 8.

Polyphenols may be referred to as antioxidants or having anti-inflammatory properties. Consuming foods high in polyphenols is known to help reduce oxidative stress, inflammation, and the formation of atherosclerotic plaque.[3,10,39]

Table 8. Food Sources of Polyphenols

Polyphenols	Food Sources
Beta-carotene	• Sweet potatoes, carrots, pumpkin, apricots, red bell peppers, and other red, orange, and yellow vegetables and fruits
Vitamin C	• Citrus fruit, peppers, and strawberries
Vitamin E	• Nuts and seeds, wheat germ, avocado, and soy proteins
Selenium	• Brazil nuts, yeast extract spread (e.g., Marmite® and Vegemite®), turnips, tofu, eggs, mushrooms, and seafood
Flavonoids	• Cocoa,[54] tea, grapes, red wine, and blueberries

How do vegetables and fruits improve heart health?

Vegetables and fruit improve heart health by providing nutrients that have antioxidant properties. Consuming five or more servings of brightly coloured vegetables and fruits each day is associated with:[1,3,55,56]

- Reducing CV risk, including heart disease and stroke
- Lowering blood pressure
- Reducing CV mortality. Once intake exceeds 5 servings/day there is no further risk reduction observed.
- Lowering triglycerides

Alcohol

Return to Key Questions List

Does alcohol affect heart health?

Excessive alcohol consumption is a leading cause of chronic disease. The general recommendation for adults is to follow Canada's Low Risk Alcohol Drinking Guidelines to minimize an individual's overall health risk.

For individuals at risk for CV disease that choose to consume alcohol, greater than 2 drinks/day is not recommended as it can elevate triglycerides, and the risk for pancreatitis is proportional to the amount of alcohol consumed.[32,57,58] For patients with triglycerides above 5.5 mmol/L, it is recommended to avoid all alcohol.[3]

Considerations

Red wine:

- Wine is fermented alcohol that contains polyphenols (i.e. resveratrol). Resveratrol is known for its potential beneficial effects on serum lipids, inflammation, blood vessels, and blood pressure. Evidence for the positive effect of wine on CV health is limited and additional research is required to support recommendations.[59]
- Refer to [AHS Alcohol Information for Health Professionals](#) for more information.

Weight   Return to **[Key Questions List](#)**

Does excess adipose tissue impact heart health?

Obesity or carrying excess adipose tissue centrally (also referred to as central adiposity) is an independent risk factor for CV disease. For patients living with obesity or with central adiposity, weight loss of 5–10% from baseline weight and reducing waist circumference may improve the lipid profile and reduce CV event risk.

Refer to Nutrition Guideline: [Adult Obesity Care](#) for more information.

Physical Activity   Return to **[Key Questions List](#)**

Is physical activity recommended for heart health?

Regular activity is important for overall health and CV disease prevention.[1,32] Moderate-intensity activity or higher is encouraged to help lower CV event risk and improve the lipid panel, see Table 9 for physical activity recommendations. Note that patients can accumulate time in 10-minute bouts or more.[1,32]

Table 9. Physical Activity Suggestions to Lower CV Risk and Specific Lipid Levels[1,32]

Activity	Lower CV Risk	Lower LDL	Raise HDL	Lower Triglycerides
Aerobic activity (moderate to vigorous intensity)	150 min weekly or 30–60 min/day	200–300 min/week or 30–60 min/day	30–60 min/day	30–60 min/day Limit time without activity Exercise before higher fat meals
Resistance training (muscle and bone-strengthening activities)	≥2 times weekly		≥3 times weekly	

*Recommend patients consult with their physician or physiotherapist prior to beginning.

Smoking Cessation

Does smoking affect heart health?

Smoking daily or occasionally is a risk factor for CV disease. Healthcare professionals are encouraged to assess patients' use of tobacco products as they are a major risk of atherogenic CV disease.

Smoking cessation reduces CV mortality and myocardial infarction by 50% or more in those with CV disease. Quitting smoking can raise HDL by 7–12%.[1] Heart disease risk associated with smoking begins to decrease soon after cessation and may continue to decrease over time. The risk of atherosclerosis and blood clots related to smoking also declines over time following cessation.

For smoking cessation supports for patients, visit www.albertaquits.ca

Considerations

What are other important considerations for patients with cardiovascular disease?

Household Food Insecurity

Household food insecurity (HFI) is defined as "an inadequate or insecure access to food because of financial constraints";[60] it impacts physical, mental and social well-being. Health professionals will encounter patients living in food-insecure households, due to the high prevalence of HFI among those accessing health care.[61]

HFI is best addressed through income-based interventions.[60,62,63] Those experiencing HFI have food preparation, budgeting, and cooking skills similar to the general population.[64] Interventions focused on food skills do not protect people from, nor improve HFI.[64] Emergency food programs (e.g. food banks) may provide temporary relief.[65] However, these programs do not solve HFI and are inappropriate and/or inaccessible for many patients.[65]

Health professionals can offer better support if they are aware when patients are worried about having enough money for food and are experiencing other challenges because of financial strain.[66,67] Health professionals are encouraged to work with patients to develop interventions that are sensitive to financial strain.

Key steps for health professionals include:
- Learn about financial strain, how to screen patients for poverty, and the link between poverty and poorer health through the **Identifying Financial Strain and Addressing Financial Barriers to Health Care Modules**; available on MyLearningLink for AHS staff and on CLiC for Covenant Health staff.
- Review the Nutrition Guideline: Household Food Insecurity for additional information on how to support patients experiencing HFI.
- Assist patients in accessing available income supports. The provincial directory 211 (ab.211.ca) can be used to identify financial benefits, programs, and services.

Resources

Are there additional resources available for patients with cardiovascular disease?

- Nutrition handouts are available for patients on a variety of topics to help support their learning needs and nutrition goals. Visit Nutrition Education Handouts for more information.

Are there additional resources available for health professionals providing care for patients with cardiovascular disease?

- Nutrition Guidelines are available on a variety of topics to help support health professionals provide consistent, evidence-based messaging. Visit Nutrition Education Handouts for more information.
- For the Canadian Cardiovascular Society's Guidelines and Position Statement, refer to CCS Guidelines and Position Statement.
- For detailed information on the Canadian National Guidelines for Hypertension, refer to Hypertension Canada 2018 Guidelines.

References

1. Anderson TJ, Gregoire J, Pearson GJ, Barry AR, Couture P, Dawes M, et al. 2016 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult. Can J Cardiol. 2016;32:1263–82.

2. Lichtenstein AH, Appel LJ, Brands M, Carnethon M, Daniels S, Franch HA, et al. Diet and lifestyle recommendations revision 2006: A scientific statement from the American heart association nutrition committee. Circulation. 2006;114(1):82–96.

3. Dietitians of Canada. Cardiovascular Disease - Summary of Recommendations and Evidence [Internet]. 2020. Available from: Access only by subscription.

4. Jellinger PS, Handelsman Y, Rosenblit PD, Bloomgarden ZT, Fonseca VA, Garber AJ, et al. American Association of Clinical Endocrinologists and American College of Endocrinology Guidelines for Management of Dyslipidemia and Prevention of Cardiovascular Disease. Endocr Pract. 2017;23(April):1–87.

5. Pearson GJ, Thanassoulis G, Anderson TJ, Barry AR, Couture P, Dayan N, et al. 2021 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in Adults. Can J Cardiol. 2021;37(8):1129–50.

6. Handelsman Y, Jellinger PS, Guerin CK, Bloomgarden ZT, Brinton EA, Budoff MJ, et al. Consensus statement by the American association of clinical endocrinologists and American college of endocrinology on the management of dyslipidemia and prevention of cardiovascular disease algorithm-2020 executive summary. Endocr Pract. 2020;26(10):1196–224.

7. Hooper L, Martin N, Abdelhamid A, G DS. Reduction in saturated fat intake for cardiovascular disease (Review) Summary of Findings for the Main Comparison. Cochrane Database Syst Rev. 2015;(6).

8. Ference BA, Ginsberg HN, Graham I, Ray KK, Packard CJ, Bruckert E, et al. Low-density lipoproteins cause atherosclerotic cardiovascular disease. 1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the European Atherosclerosis Society Consensus Panel. Eur Heart J. 2017;38(32):2459–72.

9. Eckel RH, Jakicic JM, Ard JD, de Jesus JM, Houston Miller N, Hubbard VS, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014;129(25 Suppl 2):76.

10. Government of Canada. Canadian Nutrient File (CNF) [Internet]. [cited 2020 May 8]. Available from: https://food-nutrition.canada.ca/cnf-fce/index-eng.jsp

11. Fenton T, Royall D. Evidence Clip: Butter, margarine, saturated and trans fats – making sense of research reported in the news. Dietitians of Canada. 2015.

12. Zong G, Li Y, Wanders AJ, Alssema M, Zock PL, Willett WC, et al. Intake of individual saturated fatty acids and risk of coronary heart disease in US men and women: two prospective longitudinal cohort studies. BMJ. 2016;355:i5796.

13. Sacks M. F, Carey J. V, Anderson A. M. C, Miller III R. E, Copeland T, Charleston J, et al. Effects of High vs Low Glycemic Index of Dietary Carbohydrate on Cardiovascular Disease Risk Factors and Insulin Sensitivity. JAMA - J Am Med Assoc [Internet]. 2014;312(23):2531–41. Available from: http://www.scientificamerican.com/article/what-makes-you-fat-too-many-calories-or-the-wrong-carbohydrates/%5Cnhttp://dx.doi.org/10.1016/j.amjmed.2011.04.024%5Cnhttp://www.nejm.org/doi/abs/10.1056/NEJMc1306659

14. Bronzato S, Durante A. A Contemporary Review of the Relationship between Red Meat Consumption and Cardiovascular Risk. Int J Prev Med. 2017;8:40.

15. Micha R, Wallace SK, Mozaffarian D. Red and processed meat consumption and risk of incident coronary heart disease, stroke, and diabetes mellitus: a systematic review and meta-analysis. Circulation. 2010;121(21):2271–83.

16. World Health Organization. Red Meat and Processed Meat [Internet]. Vol. 114, Iarc Monographs on the Evaluation of Carcinogenic Risks to Humans. 2018. 511 p. Available from: http://monographs.iarc.fr/ENG/Monographs/vol114/mono114.pdf

17. U.S. Department of Agriculture. Agricultural Research Service. FoodData Central. Ghee, Clarified Butter. [Internet]. 2020. [cited 2022 May 6]. Available from: https://fdc.nal.usda.gov/fdc-app.html#/food-details/1103844/nutrients

18. St-Onge M-P, Jones PJH. Physiological effects of medium-chain triglycerides: potential agents in the prevention of obesity. J Nutr. 2002 Mar;132(3):329–32.

19. Mensink RP, Zock PL, Kester ADM, Katan MB. Effects of dietary fatty acids and carbohydrates on the ratio of serum total to HDL cholesterol and on serum lipids and apolipoproteins: a meta-analysis of 60 controlled trials. Am J Clin Nutr. 2003 May;77(5):1146–55.

20. Chiu S, Williams PT, Krauss RM. Effects of a very high saturated fat diet on LDL particles in adults with atherogenic dyslipidemia: A randomized controlled trial. PLoS One. 2017 Feb 1;12(2).

21. Estruch R, Ros E, Salas-Salvadó J, Covas MI, Corella D, Arós F, et al. Primary prevention of cardiovascular disease with a Mediterranean diet. N Engl J Med. 2013;368(14):1279–90.

22. Aune D, Keum NN, Giovannucci E, Fadnes LT, Boffetta P, Greenwood DC, et al. Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: A systematic review and dose-response meta-analysis of prospective studies. BMC Med. 2016;14(1):1–14.

23. Ros E. Nuts and novel biomarkers of cardiovascular disease. Am J Clin Nutr. 2009 May;89(5):1649S-56S.

24. Luu HN, Blot WJ, Xiang Y-B, Cai H, Hargreaves MK, Li H, et al. Prospective evaluation of the association of nut/peanut consumption with total and cause-specific mortality. JAMA Intern Med. 2015 May;175(5):755–66.

25. Luo C, Zhang Y, Ding Y, Shan Z, Chen S, Yu M, et al. Nut consumption and risk of type 2 diabetes, cardiovascular disease, and all-cause mortality: a systematic review and meta-analysis. Am J Clin Nutr. 2014 Jul;100(1):256–69.

26. Estruch R, Ros E, Salas-Salvadó J, Covas M-I, Corella D, Arós F, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. N Engl J Med. 2018;378(25):e34.

27. Lin L, Allemekinders H, Dansby A, Campbell L, Durance-Tod S, Berger A, et al. Evidence of health benefits of canola oil. Nutr Rev. 2013 Jun;71(6):370–85.

28. Sacks FM, Lichtenstein AH, Wu JHY, Appel LJ, Creager MA, Kris-Etherton PM, et al. Dietary fats and cardiovascular disease: A presidential advisory from the American Heart Association. Circulation. 2017;136(3):e1–23.

29. Bhatt DL. Reduction of Cardiovascular Events With Icosapent Ethyl–Intervention Trial - REDUCE-IT. Ameical Coll Cardiol [Internet]. 2021; Available from: https://www.acc.org/latest-in-cardiology/clinical-trials/2018/11/08/22/48/reduce-it

30. U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015-2020 Dietary Guidelines | health.gov [Internet]. [cited 2020 Jun 4]. Available from: https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/guidelines/

31.   Berger S, Raman G, Vishwanathan R, Jacques PF, Johnson EJ. Dietary cholesterol and cardiovascular disease: a systematic review and meta-analysis. Am J Clin Nutr. 2015 Aug;102(2):276–94.

32.   Jacobson TA, Ito MK, Maki KC, Orringer CE, Bays HE, Jones PH, et al. National Lipid Association recommendations for patient-centered management of dyslipidemia: Part 1 - Full report. J Clin Lipidol [Internet]. 2015;9(2):129–69. Available from: http://dx.doi.org/10.1016/j.jacl.2015.02.003

33.   Langlois K GD. Sugar consumption among Canadians of all ages [Internet]. [cited 2020 Jun 9]. Available from: https://www150.statcan.gc.ca/n1/pub/82-003-x/2011003/article/11540-eng.htm

34.   Yang Y, Liu DC, Wang QM, Long QQ, Zhao S, Zhang Z, et al. Alcohol consumption and risk of coronary artery disease: A dose-response meta-analysis of prospective studies. Nutrition [Internet]. 2016;32(6):637–44. Available from: http://dx.doi.org/10.1016/j.nut.2015.11.013

35.   World Health Organization. WHO | Sugars intake for adults and children [Internet]. Vol. 2019. World Health Organization; Available from: http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/

36.   Starbucks Canada. Nutrition data [Internet]. 2018. Available from: https://globalassets.starbucks.com/assets/94fbcc2ab1e24359850fa1870fc988bc.pdf

37.   The Heart and Stroke Foundation. Sugar, Heart Disease and Stroke. Hear Stroke Found Canada [Internet]. 2014;1–12. Available from: http://www.heartandstroke.com/atf/cf/%7B99452D8B-E7F1-4BD6-A57D-B136CE6C95BF%7D/Sugar-Eng.pdf

38.   Dietitians of Canada. Diet Composition – Low Carbohydrate Summary of Recommendations and Evidence. In: Practice-based Evidence in Nutrition [PEN]. [Internet]. 2019. Available from: Access only by subscription.

39.   Therapeutic Research Center. Welcome to the Natural Medicines Research Collaboration [Internet]. [cited 2020 May 8]. Available from: https://naturalmedicines.therapeuticresearch.com/

40.   Chutkan R, Fahey G, Wright WL, Mcrorie J. Viscous versus nonviscous soluble fiber supplements: Mechanisms and evidence for fiber-specific health benefits. J Am Acad Nurse Pract. 2012;24(8):476–87.

41.   McRorie JW. Evidence-based approach to fiber supplements and clinically meaningful health benefits, Part 2: What to look for and how to recommend an effective fiber therapy. Nutr Today. 2015;50(2):90–7.

42.   Dietitians of Canada. In adults with elevated LDL cholesterol (LDL-C), what are the effects of the following dietary components on LDL-C levels: fibre, plant sterols, nuts, soy and pulses? In: Practice-based Evidence in Nutrition [PEN]. [Internet]. Available from: Access only by subscription.

43.   Sievenpiper JL, Chan CB, Dworatzek PD, Freeze C, Williams SL. Nutrition Therapy. Can J Diabetes. 2018 Apr;42 Suppl 1:S64–79.

44.   Kastorini CM, Milionis HJ, Esposito K, Giugliano D, Goudevenos JA, Panagiotakos DB. The effect of mediterranean diet on metabolic syndrome and its components: A meta-analysis of 50 studies and 534,906 individuals. J Am Coll Cardiol. 2011 Mar 15;57(11):1299–313.

45.   Jenkins DJA, Kendall CWC, Marchie A, Faulkner D, Vidgen E, Lapsley KG, et al. The effect of combining plant sterols, soy protein, viscous fibers, and almonds in treating hypercholesterolemia. Metabolism. 2003;52(11):1478–83.

46.   Jenkins DJA, Kendall CWC, Marchie A, Faulkner DA, Wong JMW, De Souza R, et al. Effects of a Dietary Portfolio of Cholesterol-Lowering Foods vs Lovastatin on Serum Lipids and C-Reactive Protein. J Am Med Assoc. 2003;290(4):502–10.

47.   Adamsson V, Reumark A, Fredriksson IB, Hammarström E, Vessby B, Johansson G, et al. Effects of a healthy Nordic diet on cardiovascular risk factors in hypercholesterolaemic subjects: A randomized controlled trial (NORDIET). J Intern Med. 2011;269(2):150–9.

48.   Dietitians of Canada. In adults with elevated LDL-cholesterol (LDL-C), what are the effects of dietary patterns (i.e. portfolio, Mediterranean, DASH) on LDL-C levels? [Internet]. 2019. Available from: Access only by subscription.

49.   Estruch R, Ros E, Salas-Salvadó J, Covas MI, Corella D, Aros F, et al. Retraction and Republication: Primary Prevention of Cardiovascular Disease With a Mediterranean Diet. N Engl J Med 2013;368:1279-90 - PubMed [Internet]. 2018 [cited 2020 Jun 11]. Available from: https://pubmed.ncbi.nlm.nih.gov/29897867/

50.   Nerenberg KA, Zarnke KB, Leung AA, Dasgupta K, Butalia S, McBrien K, et al. Hypertension Canada's 2018 Guidelines for Diagnosis, Risk Assessment, Prevention, and Treatment of Hypertension in Adults and Children. Can J Cardiol. 2018;34(5):506–25.

51.   Jenkins DJA, Kendall CWC, Faulkner D, Vidgen E, Trautwein EA, Parker TL, et al. A dietary portfolio approach

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