Summary of Key Recommendations

Nutrition Recommendations to Reduce Risk Factors for Hypertension

Dietary Pattern

The Dietary Approaches to Stop Hypertension (DASH), Mediterranean, vegetarian, and portfolio diets are known to help manage blood pressure (BP).

Sodium

A reduction in sodium intake can lower BP.

- Prevention of hypertension (HTN): aim for 1500–2000 mg/day sodium.
- Management of HTN: aim for 1500–2300 mg/day sodium.

Potassium

Increasing dietary potassium to 4700 mg/day can help reduce BP.

- Aim to consume 4–5 servings/day vegetables and fruits, plus other foods high in potassium.

Calcium

Patients with HTN are recommended to consume the adequate intake (AI) for calcium.

- Males 19–70 years: 1000 mg/day, over 70 years: 1200 mg/day.
- Females 19–50 years: 1000 mg/day, over 50 years: 1200 mg/day.

Magnesium

Patients with HTN are encouraged to consume the AI for magnesium.

- Males 19 and older: 420 mg/day.
- Females 19–30 years: 310 mg/day, over 30 years; 320 mg/day.

Fibre

Foods high in soluble fibre have been shown to help reduce BP.

Lifestyle Recommendations to Reduce Risk Factors for Hypertension

Alcohol

Recommend avoiding alcohol or limiting intake to a maximum of 2 drinks/day.

Physical Activity

All adults with elevated BP are recommended to increase physical activity.

- Aerobic exercises: 30–60 min/day or 90–150 min/week
- Resistance exercises: 90–150 min/week
- Isometric exercises: 3 sessions/week

Smoking Cessation

Offer information and community supports to help patients who smoke quit.

Stress Management

Recommend stress management therapy for patients with HTN.

Weight

For patients living with obesity, a 5 kg (11 lbs) weight reduction can help prevent HTN and reduce BP.

Introduction

The purpose of the Hypertension Nutrition Guideline is to provide health professionals with an overview of the evidence-based nutrition recommendations for adults with hypertension (HTN) and provide answers to commonly asked questions (See Key Questions List).

Following the recommendations in this guideline can help patients:[1,2]

- Prevent and manage HTN
- Improve systolic and diastolic BP
- Reduce risk for cardiovascular disease
- Reduce risk of stroke mortality, coronary mortality, and overall mortality

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 a 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.

Key Questions List

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

Definitions

- What is hypertension?

Screening

- How is hypertension diagnosed?
- What range of blood pressure is recommended?
- What risk factors contribute to high blood pressure?

Dietary Patterns

- What dietary patterns help improve high blood pressure?
- What is the DASH diet?
- What is the Mediterranean diet?

Sodium

- Does sodium (salt) affect blood pressure?
- What tips are suggested to achieve a lower sodium diet?
- Is sea salt or Himalayan salt better than table salt?
- Are 'salt substitutes' (potassium chloride) recommended for people with hypertension?

Potassium

- Does potassium affect blood pressure?
- Are potassium supplements recommended for people with hypertension?

Calcium

- Does calcium affect blood pressure?
- Are calcium supplements recommended for people with hypertension?

Magnesium

- Does magnesium affect blood pressure?
- Are magnesium supplements recommended for people with hypertension?

Vitamins and Minerals

- Are there other vitamins and minerals to consider in the prevention and treatment of hypertension?

Fibre

- Does fibre affect blood pressure?

Alcohol, Caffeine, and Cocoa

- Does alcohol affect blood pressure?
- Does caffeine affect blood pressure?
- Does dark chocolate or cocoa affect blood pressure?

Physical Activity

- Is physical activity recommended for managing high blood pressure?

Smoking Cessation

- Does smoking affect blood pressure?

Stress Management

- Does stress affect blood pressure?

Weight

- Are people with obesity at higher risk for hypertension?

Considerations

- What are other important considerations for patients?

Resources

- Are there additional resources available for patients?
- Are there additional resources available for health professionals?

Answers to Key Questions

Definitions

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What is hypertension?

Hypertension is characterized by elevated BP. Elevated BP leads to decreased elasticity and damaged small blood vessels. It also causes thickening of the arteries and increases the risk for arterial plaque build-up known as atherosclerosis.[2,3] Atherosclerosis increases the risk of cardiovascular disease including heart failure, stroke, and coronary artery disease, as well as chronic kidney disease, dementia, and death.[2,4] There are 2 main types of HTN:[5]

- **Primary hypertension:** This is the most common form of HTN and is also referred to as essential or idiopathic. The cause of elevated BP may be due to nutrition or lifestyle habits such as increased sodium (salt) intake, chronic stress, or the cause may be unknown.
- **Secondary hypertension:** High BP is due to an underlying comorbidity or chronic condition like chronic kidney disease or endocrine disorders. Preventing HTN or managing BP can significantly influence the progression of these chronic health conditions.

Screening

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How is hypertension diagnosed?

Hypertension is diagnosed using the criteria in Table 1.

Table 1. Diagnosis of Hypertension[6]

Diagnosis	Blood Pressure
Using automated blood pressure	≥135/85 mmHg
Using non-automated blood pressure	≥140/90 mmHg
People with diabetes*	≥130/80 mmHg
No diagnosis Whitecoat hypertension	≥135/85 mmHg at the clinic and <135/85 mmHg at home or using the average of a 24-hour ambulatory monitor.

*Using non-automated BP monitor in clinic

For more information on the diagnosis of HTN, refer to the Hypertension Canada Guidelines.

Considerations

Patients with obesity[6]

- The increased size or shape of the upper arm in patients with obesity may:
  - Lead to inaccurate BP measurements.
  - Prevent the arm cuff from fitting. A wrist measurement may be used as an alternate option.
- For more information, refer to the Nutrition Guideline: Adult Obesity Care.

What range of blood pressure is recommended?

Patients without Hypertension

It is recommended that patients without HTN target to keep BP below 120/80 mmHg to maintain good health and reduce the risk of stroke and heart disease.

Patients with Cardiovascular Risk and Diabetes

BP targets for patients with cardiovascular risk and diabetes vary depending on comorbid conditions and risk factors, refer to Table 2.[6] BP targets and treatment plans are determined in collaboration with patients and their primary care providers.

Table 2. Blood Pressure Targets to Treat Hypertension[6]

Patient Population	BP Treatment Target	
	Systolic BP (mmHg)	Diastolic BP (mmHg)
Low to Moderate Risk • Low cardiovascular risk factors	<140	<90
Diabetes	<130	<80
High Risk • Age ≥75 years • Cardiovascular disease • Chronic kidney disease	<120	-

What risk factors contribute to high blood pressure?

There are both modifiable and non-modifiable risk factors that may contribute to high blood pressure. HTN treatment and management focus on modifiable risk factors as summarized in Table 3.[6]

Table 3. Modifiable Risk Factors that Lower Blood Pressure[6]

Modifiable Risk Factor	Recommendations
Eating behaviours	Heart healthy dietary patterns include the Dietary Approaches to Stop Hypertension (DASH) diet, Mediterranean diet, vegetarian diet, and portfolio diet. See Dietary Patterns for more information.
Stress management	Include stress management as part of the intervention for patients with HTN. Patients with lower education and/or socioeconomic status are at an increased risk for HTN. See Stress Management for more information.
Physical activity	Regular, moderate exercise can help to lower systolic BP. See Physical Activity for more information.
Alcohol	Reducing alcohol intake can help lower BP. See Alcohol for more information.
Smoking	Advise patients who smoke to quit, and offer supports within the community. See Smoking Cessation for more information.
Sleep quality	Insufficient sleep is thought to be a potential contributor to elevated BP. Sleep experts recommend adults get 7–8 hrs sleep/night. More information on sleep quantity and quality can be found at CDC: Basics About Sleep

Non-Modifiable Risk Factors Include:

- **Age**: BP tends to increase with age due to the natural thickening and stiffening of blood vessels.
- **Ethnicity**: high BP is more common in people of African American descent.[7]
- **Genetics**: genes associated with the risk of developing higher BP or being more sensitive to sodium in the diet can often run in a family.
- **Other Health Conditions**: Many people with HTN may have other comorbid conditions like dyslipidemia, diabetes, and abdominal obesity.[7] Consider management of other comorbidities. Refer to Nutrition Guidelines on other diseases or specialty areas.

Dietary Patterns

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What dietary patterns help improve high blood pressure?

Eating patterns known to lower BP are rich in vegetables, fruits, whole grains, low-fat dairy products, and plant-based proteins.[2,6] They include a moderate amount of unsaturated fat from nuts, seeds, olive oil, and fish, as well as lean high-quality protein from poultry and unprocessed meat. These dietary patterns have many similarities to Canada's food guide; however, the research on HTN has focused on the following dietary patterns:

- Dietary Approaches to Stop Hypertension (DASH) diet
- Mediterranean diet
- Well-designed vegetarian diets
- Portfolio diet

Nutrition Handouts

Visit Nutrition Education Handouts for patient handouts on a vegetarian diet and portfolio diet.

What is the DASH diet?

The DASH diet recommends a sodium reduction and includes foods that are rich sources of specific minerals including calcium, potassium, and magnesium. See Table 4.[2,6]

Table 4. DASH Diet Recommendations Based on 2000 kcal/day[6]

Food	Portion	Recommendations and Serving Size
Whole grains	6–8 servings/day	• 1 slice whole grain bread • 1 cup (250 mL) whole grain cereal • ½ cup (125 mL) cooked brown rice, whole grain pasta
Vegetables	4–5 servings/day	• 1 cup (250 mL) raw leafy vegetables • ½ cup (125 mL) cooked vegetables • 4 oz (125 mL) vegetable juice (low sodium)
Fruits	4–5 servings/day	• 1 medium piece of fruit • ½ cup (125 mL) fresh, frozen, or canned fruit • ¼ cup (63 mL) dried fruit

Food	Portion	Recommendations and Serving Size
Dairy and plant-based beverages	2–3 servings/day	• 1 cup (250 mL) skim or 1% milk • ¾ cup (175 mL) yogurt, 0–2% M.F. (milk fat) • 1½ oz (50 g) cheese, 6–18% M.F. • 1 cup (250 mL) unsweetened fortified plant-based beverage
Nuts, seeds, legumes	4–5 servings/week	• ⅓ cup or 1.5 oz (100 mL) unsalted nuts (e.g., almonds, peanuts, walnuts, sunflower) • 2 Tbsp (30 mL) nut/seed butter or seeds (e.g., pumpkin, sunflower) • ½ cup (125 mL) cooked dry beans or peas (e.g., soybeans, lentils, chickpeas, edamame) • ¾ cup (175 mL) tofu

Meats, poultry, fish	<6 oz/day
	(<150 g/day)
		• Cooked lean meats
		  ○ Fish (e.g., char, herring, mackerel, salmon, sardines, trout)
		  ○ Trim away visible fat from red meat, duck, goose, lamb, etc.
		  ○ Broil, roast, or boil. Avoid frying
		  ○ Remove skin from poultry

Oils and fats	2–3 tsp/day (10–15 mL/day)	• Heart healthy oils (e.g., extra virgin olive oil, avocado) • Vegetable oil (e.g., safflower, canola, or corn) • Soft margarine (non-hydrogenated), mayonnaise, or salad dressing
Sweets	≤5 servings/week	• 1 Tbsp (15 mL) sugar, jelly, or jam • ½ cup (125 mL) sorbet, frozen yogurt, or ice cream
Sodium	Aim for 1500 mg (2/3 tsp) salt/day	• 2300 mg sodium will help lower BP, moving to 1500 mg will lower it further • Choose foods with less than 15% DV (Daily Value) for sodium • Choose low sodium or no salt added versions of food products

Effect of DASH Diet on Hypertension

Research shows the DASH diet is an effective treatment in people with HTN. The DASH diet can lower BP in people with or at risk for HTN, with or without antihypertensive medications as shown below:[2,6–9]

General Population

- Reduces systolic BP by 3–6 mmHg
- Reduces diastolic BP by 2.1–3 mmHg

People with Hypertension

- Reduces systolic BP by 5–11 mmHg
- Reduces diastolic BP by 3–5.5 mmHg

Nutrition Handouts

Visit MyHealth.Alberta.ca for information on the DASH diet, including a DASH Diet Sample Menu.

Considerations

Patients living with obesity:

- Individuals with excess adipose tissue and HTN who follow an energy-restricted heart healthy diet, such as the DASH diet, can achieve a greater reduction in BP.
- For more information, refer to Nutrition Guideline: Adult Obesity Care.

Patients with chronic kidney disease (CKD):

- Higher intake of foods rich in potassium and phosphorus may be contraindicated in patients with CKD.
- The DASH diet may be useful for patients with stages 1–3 CKD who do not require a restriction in phosphorus or potassium.
- The DASH diet is not recommended for patients with stage 4 or 5 CKD.
- For information on CKD and dietary patterns, refer to Nutrition Guideline: Renal.

What is the Mediterranean diet?

The Mediterranean diet is a heart healthy eating pattern based on the eating habits of countries bordering the Mediterranean Sea. A description of the Mediterranean diet can be found in Table 5. Studies have shown that the Mediterranean diet improves cardiovascular risk factors including waist circumference, high-density lipoprotein (HDL) cholesterol, triglycerides, and BP.[10,11]

Table 5. Description of Mediterranean Diet[12–14]

Food	Portion	Recommendations and Serving Size
Olive oil	≥4 Tbsp (60 mL)/day	• Abundant use of extra virgin or virgin olive oil used in cooking and on salads.
Vegetables	≥5 servings/day	• 1 medium vegetable • ½ cup (125 mL) fresh, frozen, or canned with no added salt or sugar • 1 cup (250 mL) raw, leafy vegetables • ≥2 servings from raw vegetables or salad
Fruits	≥3 servings/day	• 1 medium fruit • ½ cup (125 mL) fresh, frozen, or canned with no added salt or sugar • ¼ cup (60 mL) dried fruit

Food	Portion	Recommendations and Serving Size

Wine	Up to 1–3 glasses wine/day.	• One glass of wine is:
		  ○ 100 mL (3.5 oz) for females
		  ○ 150 mL (5 oz) for males
		• For individuals that do not drink, do not recommend starting.

Nuts, seeds, olives, avocado	≥3 serving/week	• ¼ cup (60 mL) unsalted nuts or seeds • 10 small or 7 large olives • ½ avocado
Legumes	≥3 servings/week	• ¾ cup (175 mL) beans, peas, lentils.
Fish or seafood	≥3 servings/week	• 3.5 oz (175 mL) cooked from fresh, frozen, or canned • At least 1 serving/week from fatty fish like trout, salmon, sardines, and mackerel.
Lean meat, poultry, and eggs	≤2 serving/day	• Select poultry more often than red meat • 2.5 oz (75 g) or ½ cup (125 mL)
Sofrito sauce*	≥2 times/week	• Sofrito is a fresh condiment made from tomato, garlic, and onions. • Flavour vegetables, pasta, rice, and other dishes with Sofrito.*
Whole grains	5–6 serving/day	• ½ cup (125 mL) cooked grains, rice, pasta • ½ pita, tortilla, roti
Dairy and plant-based beverages	1–3 serving/day	• 1 cup (250 mL) skim, 1% milk, or fortified plant beverage • ¾ cup (175 mL) lower fat yogurt or kefir • 1.5 oz (50 g) cheese <20% M.F.

Foods to limit/avoid	≤1 serving/week	• 3–5 oz (100–150g) higher fat animal products:
		  ○ Red meat (high in saturated fat).
		  ○ Cured or fatty cheese (high in salt and saturated fat).

	<3 per week	• Commercially baked products:
		  ○ Pastries
		  ○ Cakes
		  ○ Doughnuts
		  ○ Cookies
		  ○ Desserts
		  ○ Pudding
		  ○ Custard

	≤1 Tbsp/day	• Cream, butter, or margarine
	≤1 drink/day	• Sugar-sweetened beverages
	Limit or avoid	• French fries or potato chips
	Limit or avoid	• Cold meat, pate

Nutrition Handouts

Visit Nutrition Education Handouts for a patient handout on the Mediterranean diet.

Considerations

Patients living with obesity:

- Those with excess adipose tissue and HTN who follow an energy-restricted heart healthy diet, such as the Mediterranean diet, can achieve a greater reduction in BP.
- For more information on weight management, refer to Nutrition Guideline: Adult Obesity Care.

Patients with chronic kidney disease (CKD):

- The higher intake of foods rich in potassium and phosphorus may be contraindicated in patients with CKD.
- For information on CKD and diet patterns, refer to Nutrition Guideline: Renal.

Sodium

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Does sodium (salt) affect blood pressure?

A sodium reduction can lower BP.[2] Even people without HTN can benefit from reducing their sodium intake to lower their BP. See below for recommended sodium limits.[2,9,15,16]

Sodium Recommendations*

- Prevention of hypertension: Limit sodium to 1500–2000 mg/day
- Management of hypertension: Limit sodium to 1500–2300 mg/day

*Note that 2300 mg sodium is equivalent to 1 tsp salt.

Considerations

Minimum sodium intake:

- For all adults, it is not recommended to reduce sodium below 1500 mg.
- For detailed information on nutrient requirements, refer to Dietary Reference Intakes.

Kidney disease and heart failure:

- Patients with comorbidities involving the kidney or heart can retain fluid if sodium intake is too high. For recommendations on these comorbid conditions, refer to the following Nutrition Guidelines: Renal and Heart Failure.

What tips are suggested to achieve a lower sodium diet?

Canadians consume most of their sodium from baked goods, mixed dishes (e.g., pizza), processed meats (e.g., bacon, ham), and soups.[17] The average restaurant meal contains 1455 mg/serving sodium.[18] See below for a list of tips to lower sodium intake.

Tips to Lower Sodium Intake

- Eat fresh, unprocessed foods
  - Cook at home as often as possible
- Limit restaurant meals and fast foods
  - If eating at a restaurant or fast-food location, choose smaller portions
  - Ask for condiments and sauces on the side and use a smaller amount on food
  - Ask for no added salt
- Season foods with herbs and spices
  - Remove the saltshaker from the table (e.g., table, Himalayan, sea, kosher)
  - Taste buds will adjust over time
- Avoid salty snack foods (e.g., chips, crackers)
  - Replace with low sodium alternatives (e.g., unsalted nuts, air-popped popcorn)
- Read the Nutrition Facts table on food labels
  - Aim for foods with ≤5% Daily Value (DV) sodium
  - Limit foods with ≥15% DV sodium
- Read the Ingredients List on food packages
  - If the word “salt”, “sodium”, or “soda” appears in the first 3 ingredients, choose an alternate food

Nutrition Handouts

Visit Nutrition Education Handouts for patient handouts on sodium.

Considerations

Kidney disease and heart failure:

- For sodium recommendations for those with comorbid conditions involving the kidneys or heart, refer to the following Nutrition Guidelines: Renal and Heart Failure.

Is sea salt or Himalayan salt better than table salt?

All salt, regardless of the source, contributes to sodium intake and is recommended to be consumed in small quantities. The use of sea salt or Himalayan salt is not recommended over the use of other salts like kosher salt or white table salt.

Sea salt is obtained directly through the evaporation of seawater. Himalayan salt is mined from rock crystals. Both salts are made of sodium chloride, the basis of table salt. However, they also contain additional trace minerals such as magnesium, potassium, calcium, and other nutrients. The minerals found in sea salt and Himalayan salt are in very small amounts and are much greater in other dietary sources. Table salt is processed to remove these minerals.

Sea salt and Himalayan salt still contribute to daily sodium intake and will have the same effect on BP.[19] Limitation of all sources of salt and sodium are recommended.

Are 'salt substitutes' (potassium chloride) recommended for people with hypertension?

Salt substitutes (e.g., No-Salt®, Half-Salt®) contain potassium chloride instead of sodium chloride. The use of salt substitutes is a potential strategy to reduce sodium intake. Some sodium-reduced foods (e.g. low-sodium soups) also contain potassium chloride as a salt substitute.

Spice and herb mixtures with no salt added are safe to use for most individuals (e.g., Mrs. Dash®). Individuals should be encouraged to read the list of ingredients to ensure there is no salt added.

Considerations

Contraindications for salt substitutes:

- Salt substitutes are not recommended for individuals who need to limit the amount of potassium in their diet or are taking medications such as potassium-sparing medications. Encourage patients to check with their healthcare provider before using salt substitutes.
- For more information, refer to Nutrition Guideline: Renal.

Potassium

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Does potassium affect blood pressure?

Increasing dietary potassium intake to 4700 mg/day can help reduce BP.[9] This is the AI recommended for all adults. To meet this target, it is recommended to consume 4–5 servings/day vegetables and fruits, plus other foods high in potassium.

Nutrition Handouts

Visit the Nutrition Education Handouts for a handout on Potassium sources.

Considerations

Hyperkalemia:

- Patients taking certain medications or those with chronic kidney disease are at risk of hyperkalemia, therefore, they need to be cautious when increasing dietary potassium. Consultation with the healthcare team and laboratory monitoring is recommended.
- For more information, refer to Nutrition Guideline: Renal.

Are potassium supplements recommended for people with hypertension?

Patients with hypertension are encouraged to consume adequate potassium from dietary sources. If the AI of 4700 mg/day cannot be met through diet, supplementation may be considered. This supplementation may be in the form of a salt substitute added to foods (e.g., potassium chloride) or a potassium supplement up to 3700 mg/day.

Consultation with the healthcare team and laboratory monitoring would be necessary with potassium supplementation.

Considerations

Acute or chronic kidney disease:

- Consultation with the healthcare team is recommended when addressing potassium levels for patients with acute or chronic kidney disease.
- For more information, refer to Nutrition Guideline: Renal.

Hypokalemia or hyperkalemia:[7]

- Both low serum potassium and high serum potassium can be caused by many factors and involve various treatments. Consultation with a pharmacist and physician is recommended.

Calcium

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Does calcium affect blood pressure?

Consuming ≥800 mg/day calcium can help reduce BP (up to 4/2 mmHg) in adults with HTN.[9] People with HTN are recommended to consume adequate dietary calcium to meet the AI. See requirements below:

- Males 19–70 years: 1000 mg/day, over 70 years: 1200 mg/day.
- Females 19–50 years: 1000 mg/day, over 50 years: 1200 mg/day.

Nutrition Handouts

Visit Nutrition Education Handouts for patient handouts on Calcium.

Considerations

Patients with or at risk of osteoporosis:

- For recommendations specific to this population, refer to the Nutrition Guideline: Calcium and Vitamin D for Prevention and Treatment of Osteoporosis.

Are calcium supplements recommended for people with hypertension?

Most people with or at risk for HTN can meet their calcium needs through food. If dietary intake is insufficient, a supplement may be considered. Taking a calcium supplement for the treatment or prevention of HTN is not recommended as evidence is lacking to show benefit.[6,9]

The upper limit for calcium is 2500 mg/day. Calcium supplements that lead to an intake of both supplements plus food above 2500 mg/day are not recommended.[9,20] There is limited evidence on the effects of calcium supplementation in people at high cardiovascular risk.

Studies show that the general population has no beneficial or harmful effects on cardiovascular events when taking up to 1500 mg/day calcium in supplement form.[20] For detailed information on nutrient requirements, refer to Dietary Reference Intakes.

Considerations

Supplement dose:

- Calcium supplements are best absorbed when no more than 500 mg elemental calcium is taken at one time.[21] For example, if a patient is taking 1000 mg calcium/day, recommend they split the dose, and take 500 mg at 2 separate times each day.

Bariatric surgery:

- Patients who have had bariatric surgery are at increased risk for calcium and other micronutrient deficiencies.
- For more information, refer to Nutrition Guideline: Adult Obesity Care.

Celiac disease:

- Patients with celiac disease are at higher risk of calcium deficiency.
- For more information, refer to Nutrition Guideline: Gluten-free Diet.

Kidney stones:

- Supplemental calcium is discouraged in this population.
- For more information, refer to Nutrition Guideline: Kidney Stones.

Magnesium

Return to Key Questions List

Does magnesium affect blood pressure?

The effect of dietary sources of magnesium on BP remains unclear. Patients with HTN are encouraged to consume adequate magnesium to meet the AI as part of a healthy diet. The AI for magnesium is 310–420 mg/day.[9]

- Males 19 and older: 420 mg/day.
- Females 19–30 years: 310 mg/day; over 30 years: 320 mg/day.

Nutrition Handouts

Visit Nutrition Education Handouts for patient handouts on Magnesium.

Are magnesium supplements recommended for people with hypertension?

Routine supplementation of magnesium for the prevention and treatment of HTN is not supported by national guidelines at this time.[6] For most individuals, magnesium can be attained from food. If dietary intake is insufficient to meet the daily requirements, supplementation may be considered.[9] If supplementation is considered, titrate dose up slowly to reduce gastrointestinal side effects (e.g., diarrhea).[9]

Considerations

- For all adults, it is not recommended to exceed 350 mg/day supplemental magnesium.
- For detailed information on nutrient requirements, refer to the Dietary Reference Intakes.

Vitamins and Minerals

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Are there other vitamins or minerals to consider in the prevention and treatment of hypertension?

Some certain vitamins and minerals have been researched in the prevention or management of HTN. See Table 6.

Table 6. Vitamins and Minerals with Potential Roles in Preventing or Managing Hypertension

Micronutrient	Recommendation	Considerations
Vitamin C	No current evidence with supplemental vitamin C and HTN.[22]	Patients with a history of kidney stones are recommended to avoid high doses of supplemental vitamin C. For more information, refer to Nutrition Guideline: Kidney Stones.
Vitamin D	Vitamin D is essential for calcium absorption. Routine vitamin D supplementation for the general adult population is safe and necessary: • Adults 18–50 years: supplement 400 IU/day • Adults 51 years and older: supplement 1000 IU/day The association between low vitamin D levels and increased HTN risk is inconsistent. There is no evidence to support supplementation specific to HTN.[23,24]	For patients with or at risk of osteoporosis, refer to the Nutrition Guideline: Calcium and Vitamin D for Prevention and Treatment of Osteoporosis. Patients post-bariatric surgery can develop micronutrient deficiencies, including vitamin D. For more information, refer to Nutrition Guideline: Adult Obesity Care. Patients with celiac disease are at higher risk of vitamin D deficiency. For more information, refer to Nutrition Guideline: Gluten-free Diet.

Micronutrient	Recommendation	Considerations
Folic Acid	There is insufficient evidence to support folic acid supplementation for HTN at this time.[2,25]	Individuals of childbearing age who may become preganant are recommended to take a daily multivitamin with 400 mcg/day folic acid. Those who also have pre-existing diabetes, obesity, advanced liver disease, or alcohol misuse may require higher folic acid supplementation. For more information, refer to Nutrition Guideline: Pregnancy. Patients living with obesity or post-bariatric surgery can develop micronutrient deficiencies, including folate. For more information, refer to Nutrition Guideline: Adult Obesity Care.

Fibre

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Does fibre affect blood pressure?

There are different types of fibre in foods. Soluble fibre may be beneficial in reducing BP.[2] The following are soluble-rich foods that have been shown to moderately lower BP.

- Ground or milled flaxseed
- Oat bran
- Barley

People with or at risk for HTN are recommended to consume the same amount of total fibre as the general population. Most adults require about 25–38 g/day fibre for general health.[12,26]

When increasing fibre-rich foods, it is recommended to increase fluid (water) intake to reduce gastrointestinal side-effects such as bloating, gas, and constipation. Slowly increase fibre-rich foods over a few days or weeks. Note that fibre supplements do not have the same BP-lowering effect.

Nutrition Handouts

Visit Nutrition Education Handouts for patient handouts on Soluble Fibre.

Considerations

Pregnancy:

- Individuals who are pregnant are advised to limit their daily intake of flaxseed and flaxseed oil.[27]
- For more information, refer to Nutrition Guideline: Pregnancy.

Medications:

- To prevent interfering with the absorption of medications, flaxseeds should be taken at least two hours before or after prescription medications.

Alcohol, Caffeine, and Cocoa

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Does alcohol affect blood pressure?

The timing of alcohol affects BP differently:[2]

- Within the first several hours of alcohol intake, BP is reduced.
- BP is increased 10–15 hours after initial alcohol intake.

People with HTN are recommended to reduce alcohol consumption or abstain to reduce BP and prevent HTN. There is no safe limit for alcohol consumption to prevent HTN.[28]

In healthy adults, abstaining from alcohol or reducing alcohol intake to 2 drinks/day or less is recommended for the prevention and management of HTN.[28]

People who choose to consume alcohol or would like help reducing their intake can refer to Canada's Low Risk Alcohol Drinking Guidelines.[29]

For more information for healthcare professionals on alcohol, visit AHS Alcohol Information for Health Professionals.

Does caffeine affect blood pressure?

Caffeine raises BP temporarily by stimulating the nervous system, constricting blood vessels, and reducing dilation of the blood vessels.[2,30] Although there are changes in BP due to caffeine intake, there is no indication for people with or at risk for HTN to lower their caffeine intake below what is recommended for the general population. All adults are recommended to consume no more than 400 mg/day caffeine.

Table 7 provides examples of sources rich in caffeine. This list is not comprehensive.

Table 7. Caffeine Content in Foods and Beverages[31]

Food or Beverage	Serving Size	Caffeine Content
Coffee, brewed	1 cup or 8 oz (250 mL)	100–170 mg
Tea, leaf or bag (black, flavoured black)	1 cup or 8 oz (250 mL)	43–80 mg
Tea (green, oolong, white)	1 cup (250 mL)	25–48 mg
Dark chocolate	1 bar (40 g)	27 mg
Carbonated soft drinks (e.g., diet cola, cola, root beer)	355 mL (1 can)	25–43 mg
Energy drink, various types	1 cup (250 mL)	80–100 mg

The time that caffeine is consumed can affect BP differently. Consuming about 200–300 mg caffeine may temporarily increase BP in people with HTN in the following time frames:[2]

- Within 30 minutes of consuming caffeine, BP is increased
- At 1–2 hours after consuming caffeine, BP is at a peak and may last up to 4 hours
- Within 3–10 hours of consuming caffeine, caffeine will be eliminated from the body

People who do not regularly consume caffeine may see a more predominant rise in BP than people who habitually consume caffeine. People with mild HTN who consume caffeine regularly do not see an increase in BP in the long term.

Considerations

Pregnancy and lactation:

- Individuals who are planning to become pregnant, are pregnant, or are lactating should limit caffeine to a maximum of 300 mg/day.
- For more information, refer to Nutrition Guidelines: Pregnancy and Nutrition for Lactation.

Does dark chocolate or cocoa affect blood pressure?

Cocoa products with a high percent of cocoa solids contain flavonoids with antioxidant properties that can lower BP and improve vascularization of blood vessels.

Educate patients that choose to eat chocolate, to choose higher percent cocoa solid products along with being mindful of the added calories, sugar, and fat that is often associated with cocoa products like chocolate bars and chocolate milk.

Physical Activity

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Is physical activity recommended for managing high blood pressure?

Increasing physical activity can lead to a reduction in BP. Adults with elevated BP or HTN are recommended to increase physical activity with a structured exercise program to the amounts recommended below (see Table 8).[6,7] Recommend patients consult with their physician or physiotherapist prior to beginning.

Table 8. Physical Activity Recommendations for Patients with Hypertension[6,7]

Aerobic Exercises	Resistance Exercises	Isometric Exercises
30–60 min/day or 90–150 min/week • Walking • Jogging • Cycling • Swimming	90–150 min/week • Weight training	3 sessions/week • Hand grip • Plank • Side-bridge • Yoga balancing poses

For more information on specific exercise recommendations refer to the Hypertension Canada Guidelines.[6]

Smoking Cessation

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Does smoking affect blood pressure?

The nicotine in cigarettes and other tobacco products causes an acute increase in BP and heart rate. Smoking and tobacco use are one of the major modifiable risk factors for high BP and risk of HTN.[2,32,33] Smoking cessation is recommended to support vascular protection, pulmonary health, and lower cardiovascular risk.[2,9]

Support patients who smoke to quit and offer information about community supports. See www.albertaquits.ca for more information or visit AHS: Health & Wellness for information on Smoking & Tobacco Cessation

Stress Management

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Does stress affect blood pressure?

Hormones released during stress can temporarily increase BP causing a rapid heart rate and narrowing of the blood vessels (vasoconstriction). Sustained elevated BP may be the result of chronic and non-adaptive responses to stress.[2] If stress is a contributing factor to elevated BP in people with HTN, stress management therapy is recommended.[6]

A referral to Mental Health services can support the patient with stress management strategies. See AHS Mental Health Resources for more information.

Weight

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Are people with obesity at higher risk for hypertension?

Having excess body weight and/or abdominal adiposity is correlated with elevated BP.[19] For individuals living with obesity who have HTN or are at risk of developing HTN, obesity treatment is recommended.[2,7,34] A 5 kg (11 lbs) reduction in body weight can help prevent HTN and reduce BP in people with HTN.[2] A greater reduction in BP is seen with additional weight loss, refer to Table 9.

Table 9. Weight Loss and Associated Reduction in Blood Pressure[22,35]

Weight Loss	Systolic BP Reduction	Diastolic BP Reduction
For each 1 kg (2.2 lb) lost	1.6 mmHg	1.1 mmHg
For each 5 kg (11 lb) lost	4–7 mmHg	3–6 mmHg

Weight loss has a similar effect on lowering BP as antihypertensive medications in people living with obesity and/or with excess abdominal adiposity.[6]

Refer to the Nutrition Guideline: Adult Obesity Care for further information on screening/assessing for obesity/central adiposity and treatment options if applicable.

Considerations

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What are other important considerations for patients with HTN?

Household Food Insecurity

Household food insecurity (HFI) is defined as "an inadequate or insecure access to food because of financial constraints";[36] it impacts physical, mental and social well-being. Providers will encounter patients living in food-insecure households, due to the high prevalence of HFI among those accessing health care.[37]

HFI is best addressed through income-based interventions.[36,38,39] Those experiencing HFI have food preparation, budgeting, and cooking skills similar to the general population.[40] Interventions focused on food skills do not protect people from, nor improve HFI.[40] Emergency food programs (e.g. food banks) may provide temporary relief.[41] However, these programs do not solve HFI and are inappropriate and/or inaccessible for many patients.[41]

Care providers 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.[42,43] Providers are encouraged to work with patients to develop interventions that are sensitive to financial strain.

Key steps for care providers 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 Covenant Learning Connection (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.

Refer to Nutrition Guideline: Household Food Insecurity and Household Food Insecurity in Alberta: A Backgrounder for in-depth information on this topic.

Resources

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Are there additional resources available for patients?

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?

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 detailed information on the Canadian National Guidelines on Hypertension, refer to Hypertension Canada Guidelines.

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