Chapter 20 : Nutrition for Patients with Cardiovascular Disorders

What are Heart Diseases?

- A general term that covers a number of diseases which affect the heart, including coronary artery disease, heart-failure and angina.

- Cardiovascular disease is the # 1 killer.

- **It is highly preventable and controllable with diet and exercise.**

Hypertension

- Dietary factors play a prominent role in blood pressure regulation

TABLE 20.1 Blood Pressure Classifications

	Systolic	Diastolic
Normal blood pressure	<120	and <80
Prehypertension	120–139	or 80–89
Stage 1 hypertension	140–159	or 90–99
Stage 2 hypertension	≥160	≥100

Hypertension

- In people with stage 1 hypertension
  - Diet is the initial treatment before drug therapy is introduced and may eliminate the need for medication

- In people who have hypertension and are treated with medication, diet can lower blood pressure and reduce the dose of medication needed

TABLE 20.2 Diet and Lifestyle Recommendations to Lower Blood Pressure and Reduce the Risk of CVD

	Diet-Related Lifestyle Modifications that Effectively Lower Blood Pressure*	AHA Diet and Lifestyle Recommendations to Reduce the Risk of CVD†
Attain/maintain healthy body weight.	✓	✓
Consume a diet rich in vegetables and fruit.	✓	✓
Consume a diet rich in low-fat dairy products.	✓	
Choose whole grains.	✓**	✓
Consume 2 servings of fish/week, preferably fatty fish.		✓
Limit saturated fat and cholesterol intake.	✓	✓
Limit added sugars.	✓	✓
Limit salt.	✓	✓
Increase potassium intake.	✓**	
Follow recommendations when food is eaten outside the home.		✓
Drink alcohol in moderation, if at all.	✓	✓

The DASH Diet

Dietary
Approaches to
Stop Hypertension

- **Eating a diet rich in:**
  - Fruits, vegetables
  - low-fat dairy products
  - Nuts and legumes (a high intake of K, Mg, Ca, protein, and fiber)

- **Reduced amounts of:**
  - Fat
  - Red meat
  - Sweets, and sugar-sweetened beverages (a low intake of saturated fat, cholesterol, total fat, and extra sugars)

Significantly lowers both systolic and diastolic blood pressures as well as cholesterol

DASH-sodium

- Lowering sodium with either the control diet or DASH diet lowers blood pressure
- The lower the sodium intake, the lower the blood pressure.

- At each sodium level, blood pressure was lower on the DASH diet than on the control diet.

DASH-sodium

- The greatest reduction in blood pressure occurred at 1500 mg of sodium

- The DASH diet recommends that sodium intake initially be lowered to 2300 mg and gradually decreased to 1500 mg for maximum benefit

Whole and other grains and grain products*	
Cooked cereal, rice, pasta, unsalted, ½ cup	0–5
Ready-to-eat cereal, 1 cup	0–360
Bread, 1 slice	110–175
Vegetables	
Fresh or frozen, cooked without salt, ½ cup	1–70
Canned or frozen with sauce, ½ cup	140–460
Tomato juice, canned, ½ cup	330
Fruit	
Fresh, frozen, canned, ½ cup	0–5
Low-fat or fat-free milk and milk products	
Milk, 1 cup	107
Yogurt, 1 cup	175
Natural cheeses, 1½ oz	110–450
Process cheeses, 2 oz	600
Nuts, seeds, and legumes	
Peanuts, salted, ⅓ cup	120
Peanuts, unsalted, ⅓ cup	0–5
Beans, cooked from dried or frozen, without salt, ½ cup	0–5
Beans, canned, ½ cup	400
Lean meats, fish, and poultry	
Fresh meat, fish, poultry, 3 oz	30–90
Tuna canned, water pack, no salt added, 3 oz	35–45
Tuna canned, water pack, 3 oz	230–350
Ham, lean, roasted, 3 oz	1020

TIPS FOR CONTROLLING SODIUM INTAKE WHILE EATING OUT

- Request that food not be salted, if possible.
- Choose fruit juice instead of soup for an appetizer.
- Use oil and vinegar or fresh lemon instead of regular salad dressing.
- Choose foods that are grilled, baked, or roasted.
- Order plain meat and vegetables without gravy or sauce, or order them "on the side" and use sparingly.
- Choose plain baked potatoes and season sparingly with sour cream, butter, or pepper.
- Select fresh fruit for dessert. If the client is going to splurge, ice cream or sherbet is a better choice than pie, cake, cookies, or other desserts.
- Avoid fast food restaurant meals, which usually are high in sodium. If you have to go, order a child-sized meal.
- Order sandwiches without mayonnaise, sauces, or condiments; load with lettuce, tomato, and onion.

Weight Loss

- Weight is directly related to blood pressure and weight loss lowers blood pressure, even if healthy weight is not attained
- With or without sodium restriction

- The greater the weight loss, the greater the reduction in blood pressure in both hypertensive and nonhypertensive people

Potassium

- As potassium intake increases→ blood pressure decreases in hypertensive and nonhypertensive people

- The impact potassium has on blood pressure depends on sodium intake:
  - Potassium is more effective in lowering blood pressure when sodium intake is high
  - And conversely, a high sodium intake raises blood pressure more when potassium intake is low

Potassium

- The recommended amount of potassium (4.7 g/day)
- Can be obtained by following the DASH guidelines of
  - 4 to 5 servings/day of both fruits and vegetables
  - Eating whole grains
  - 4 to 5 servings/ week of nuts, seeds, and legumes

QUICK BITE

Selected sources of potassium

	Potassium (mg)		*Potassium (mg)*
1 medium potato	926	½ cup cooked lentils	370
1 medium sweet potato	540	⅓ cup roasted almonds	310
½ cup cooked soybeans	440	½ cup cooked spinach	290
1 medium banana	420	½ cup zucchini	280
¼ cup apricots	380	1 medium orange	237

Coronary Heart Diseases

- Non modifiable risk factors for CHD:
  - Genetics ,,, Gender ,,, Advancing age
- Modifiable risk factors:

MAJOR MODIFIABLE RISK FACTORS FOR CHD

- High blood LDL cholesterol
- Low blood HDL cholesterol
- High blood pressure
- Obesity, especially abdominal obesity
- Physical inactivity
- Cigarette smoking
- An atherogenic (meaning likely to cause atherosclerosis) diet, namely, a diet high in saturated fat, trans fat, and cholesterol and low in vegetables, fruits, and whole grains.

High Blood Cholesterol Levels

- As the level of LDL increases, so does the risk of developing CVD.

- Levels of HDL are inversely correlated to CHD risk.

ABLE 20.5 Classification of Cholesterol Levels

	Total Cholesterol (mg/dL)	LDL cholesterol (mg/dL)	HDL cholesterol (mg/dL)
Desirable	<200	<100*	≥60
Borderline risk	200–239	130–159	
High risk	≥240	160–189†	

*Less than 70 is desirable for people at very high risk.

†Greater than 190 is considered very high risk.

Lower LDL levels

- Diet and lifestyle changes are appropriate for all people, whether the goal is preventing or treating heart disease and regardless of the LDL level.

- Cholesterol-lowering medications are added for high-risk people.

HDL levels

- It is not known if raising HDL reduces the risk of CHD, so there are no goal levels for increasing HDL

- The best strategy for people with low HDL is:
  - lower their LDL
  - lose weight if overweight
  - avoid smoking
  - Exercise

Cigarette Smoking

- Increases heart rate
- Narrows arteries
- Increases blood pressure
- Lowers HDL
- Promotes clot formation

Cigarette Smoking

- On average, male smokers die 13.2 years earlier than male nonsmokers

- People who smoke have a 2 to 4 times greater risk of CHD than nonsmokers

Metabolic Syndrome

A cluster of metabolic abnormalities that appear to promote a relatively high long term risk for both atherosclerotic CVD and type 2 diabetes

Diagnostic criteria for metabolic syndrome

Risk Factor	Defining Level
Metabolic syndrome is confirmed by the presence of three of the following five risks:	
1. Abdominal obesity*	
Men	>40 in. waist
Women	>35 in. waist
2. Elevated triglycerides	≥150 mg/dL
3. Low HDL	
Men	<40 mg/dL in men
Women	<50 mg/dL in women
4. Elevated blood pressure	≥130 mmHg systolic blood pressure or ≥85 mmHg diastolic blood pressure or Drug treatment for hypertension
5. Elevated fasting glucose	≥100 mg/dL

HEART HEALTHY DIET

- Balanced
- Varied
- Adequate

Calories, Activity, and Weight

- Excess body weight:
  - increases the risk of CHD
  - Heart failure (HF)
  - Stroke
  - cardiac arrhythmias
- by raising LDL and blood glucose levels; increasing blood pressure; and lowering HDL levels

Fruits and Vegetables

- It is not known if they reduce the risk of CVD because of the nutrients and substances they provide or because they displace other foods that are not as beneficial

Whole Grains

- Soluble fibers modestly lower LDL levels **beyond the effects of a low saturated fat, low trans fat, low cholesterol diet**

- Sources ???

Fatty Fish

- Increased intake of omega-3 fatty acids, namely, **EPA** and **DHA**, the polyunsaturated fatty acids found in fish oils, reduces the risk of CVD

how fish oils work ??

- preventing arrhythmias
- lowering triglycerides
- Lowering blood pressure
- decreasing platelet aggregation
- decreasing inflammation.

How much of fatty fish??

- The American Heart Association recommends 2 servings (~8 ounces) of **fatty fish** per week, prepared in ways that do not add saturated or trans fats.

Alpha linolenic acid

- **ALA** is an omega-3 fatty acid found in flaxseed, canola, soybeans, and walnuts.

- Can slightly prevent CVD, **but cannot be replaced by seafood** !

Saturated Fat

- increases LDL and total cholesterol levels

- Increases the ratio of LDL to HDL cholesterol

Trans Fat

- Increase LDL and total cholesterol levels
- Increases the ratio of LDL to HDL cholesterol

- Found in partially hydrogenated fats (e.g., stick margarine, shortening)

Cholesterol

- Dietary cholesterol raises LDL levels

- Lowering saturated fat intake !

Added Sugars

- The purpose of limiting the intake of beverages and foods with added sugars is to **lower calorie intake** and help ensure nutritional adequacy

Sodium

- As the intake of salt increases, so does blood pressure; high blood pressure is a major risk factor for CVD

QUICK BITE

Sodium content of selected foods

	Sodium (mg)
1 packet dry onion soup mix	3132
1 tsp salt	2325
1 six-inch fast food sub	1651
1 fast food single cheeseburger with condiments and bacon	1314
1 large fast food taco	1233
2 fast food pancakes with syrup	1104
1 cup canned macaroni and cheese	1061
1 fast food beef chimichanga	910

Plant Stanols/Sterols

- Compounds derived from soybeans and pine-tree oils
- Plant sterols are plant stanols that have been commercially hydrogenated to be used as a food additive.

- **They reduce intestinal absorption of cholesterol from food and bile.**
- For people with high LDL levels, **plant stanols/sterols** can be used as a therapeutic option to help lower LDL levels by up to 15%

Mediterranean diet