

Principles of Nutrition

**NRSG
3103**

**Nutrition for Patients with Diabetes
Mellitus, Cardiovascular Disorders, and
Kidney Disorders**

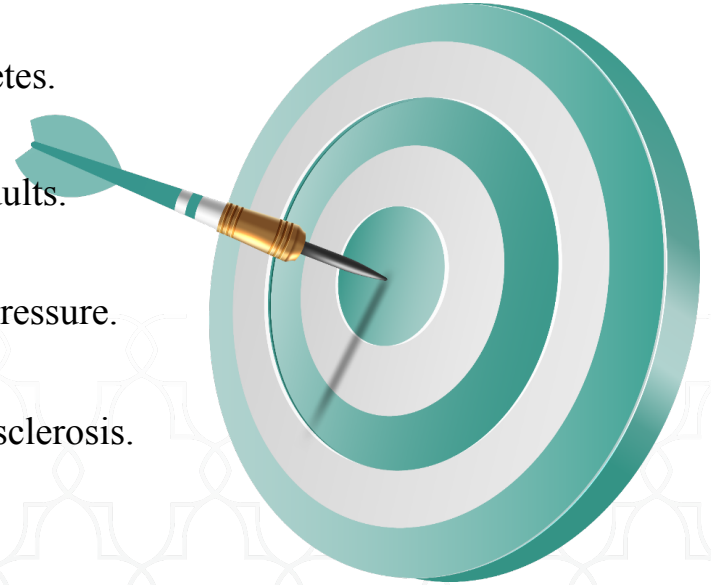


Lecture Objectives

At the end of this session, each student should be able to:

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- 1 Describe the nutrition recommendations for managing diabetes.
- 2 Discuss diabetes nutrition therapy in childhood and older adults.
- 3 Discuss diet and lifestyle interventions for lowering blood pressure.
- 4 Discuss diet and lifestyle interventions for managing atherosclerosis.



Lecture Objectives

5

Explain diet and lifestyle interventions for managing heart failure.

6

Describe a heart-healthy diet and lifestyle.

7

Explain nutrition therapy recommendations for nephrotic syndrome.

8

Explain nutrition therapy recommendations for chronic kidney disease (CKD)





Nutrition for Patients with Diabetes Mellitus

INTRODUCTION

- Diabetes is a major chronic disease with high health and economic costs. For overweight or obese individuals with prediabetes or type 2 diabetes, nutrition interventions often focus on weight loss. However, as the disease progresses, most people eventually need oral medications, insulin, or both to control blood glucose.



Preventing Diabetes

- It is done through focusing on weight loss through healthy eating and exercise.
Limiting saturated fat and increasing whole grains and fiber can improve insulin sensitivity and lower the risk of diabetes.



Managing Diabetes

- **Main goal:** keep blood glucose as close to normal as possible.

Meal Planning Approaches:

- Count and monitor carbohydrates to control blood glucose.
- Plan meals to match the person's lifestyle and food preferences.
- Main food groups: carbohydrates, meat/meat substitutes, and fats.
- Use a sample meal pattern based on usual eating habits, with a variety of healthy choices.



Macronutrients and carbohydrates :

- Acceptable Macronutrient Distribution Range (AMDR): 45%–65% of total calories.
- Low glycemic index (GI) foods can modestly improve postprandial blood glucose.
- Naturally occurring fructose in fruits and vegetables does not need to be avoided.
- Nonnutritive sweeteners (saccharin, aspartame, acesulfame, sucralose) can be used safely.



Fiber and Fats

- High-fiber foods can help you feel full, give you vitamins and minerals, and help lower serum cholesterol.
- Limits saturated fat, trans fat, and cholesterol.
- In diabetic kidney disease, keep protein at the Recommended Dietary Allowance (RDA) of 0.8 g/kg.



Sick-Day Management

- Acute illnesses can significantly raise blood glucose levels.
- Maintain normal medication schedule, monitor blood glucose levels every 2 to 4 hours, maintain an adequate fluid intake, and consult a physician to revise the dose in case of severe illness.
- A daily intake of 150 to 200 g of carbohydrates, approximately 50 g every 3 to 4 hours, is recommended.



For hospitalized patient

- Use a consistent carbohydrate meal plan.
- Adjust fat intake as needed.
- Keep meal and snack times regular; there is no single “best” hospital diet.



For Children and Adolescents

- Nutrient needs are similar to those of other children the same age.
- Growth, irregular meals, and changing activity make diabetes control harder.
- Too few calories or poor glucose control can slow growth.
- Use individualized meal plans and flexible insulin; focus on weight control to prevent type 2 diabetes.



For older adults

- Aging affects blood glucose; levels often rise over time.
- Cognitive problems may limit self-care.
- A fasting glucose goal of 90–150 mg/dL may be suitable for many older adults.



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Nutrition for Patients with Cardiovascular Disorders

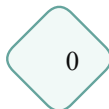


Nutrition for Patients with Cardiovascular Disorders

- Hypertension
- Atherosclerosis
- Heart Failure (HF)



Hypertension





Introduction

Diet is the first treatment for stage 1 hypertension, often eliminating the need for drugs.

For those on hypertension medication, it lowers blood pressure and reduces the required doses.



Managing Hypertension with Diet

Primary Approaches:

- **Dietary Approaches to Stop Hypertension (DASH) Diet:** is a food group approach that focuses on fruits, vegetables, whole grains, moderate fish, poultry, nuts, and low-fat red meat and sugars. Lowers systolic/diastolic pressure and cholesterol.
- **Sodium Reduction:** Less sodium lowers blood pressure; the greatest effect is at 1500 mg/day.
- **Potassium Intake:** Higher potassium intake reduces blood pressure; aim for 4.7 g per day.



Managing Hypertension with Diet

Weight Control:

- Weight gain raises blood pressure; loss lowers it.
- Achieving a healthy weight (BMI <25) is an effective intervention to manage blood pressure.
- Preventing weight gain is critical.



Atherosclerosis



Atherosclerosis

Atherosclerosis is the "hardening of the arteries." Diet significantly affects its progression and cardiovascular disease (CVD) risk.



Risk Factors of Atherosclerosis

1. Non-Modifiable Risk Factors

Genetics, gender, and advancing age.

2. Major Modifiable Risk Factors

- High LDL cholesterol, low HDL cholesterol.
- High blood pressure.
- Obesity (especially abdominal).
- Physical inactivity.
- Cigarette smoking.



Heart Failure (HF)



Heart Failure (HF)

Stages A–B (At Risk, Pre-HF):

- **Goal:** Control risks like CHD or hypertension.
- Use the DASH low-sodium diet.
- Encourage exercise, quit smoking, and avoid alcohol.



Heart Failure (HF)

Stage C HF (Structural heart disease with prior/current symptoms):

- Sodium intake should be limited to 2 g/day or less.
- A fluid restriction of 1.5 L/day for patients with hyponatremia.
- A low-calorie diet for patients who are overweight.
- Small, frequent meals.
- Soft, easy-to-chew foods for patients with fatigue.
- Increased potassium intake for patients who are taking thiazide (potassium-wasting) diuretics or digitalis.



Heart-Healthy Diet and Lifestyle

General Guidelines:

- Follow a balanced, varied, and nutritionally adequate diet.
- Include regular physical activity and avoid tobacco use.
- Recommendations to lower coronary heart disease (CHD) risk also help reduce blood pressure.

Calories, Activity, and Weight:

- Maintain a healthy weight to reduce cardiovascular disease (CVD) risk.
- Reduce calorie intake and increase physical activity for weight control.
- Limit sedentary behavior—stay active regardless of weight status.



Heart-Healthy Diet and Lifestyle

Fruits and Vegetables

- Diets rich in fruits and vegetables lower blood pressure and reduce CVD risk, especially stroke.
- Prepare foods to preserve fiber and nutrients; avoid added fat, sugar, or salt.

Whole Grains

- High intake reduces CVD risk.
- Both soluble and insoluble fiber are beneficial.

Fatty Fish and Omega-3s

- Omega-3 fatty acids reduce CVD risk.
- Eat two 4-oz servings of fatty fish weekly, prepared without added fats.



Heart-Healthy Diet and Lifestyle

Fats and Cholesterol

- Limit saturated fat (found in animal products); it raises LDL cholesterol.
- Choose lean meats and replace saturated fats with unsaturated fats.
- Total fat: 25–35% of total calories.
- Limit trans fats (<1% of calories) to lower CHD risk.
- Limit dietary cholesterol (found only in animal foods).

Added Sugars and Sodium

- Limit added sugars to reduce excess calories.
- Restrict sodium to help control blood pressure.



Heart-Healthy Diet and Lifestyle

Alcohol

- Alcohol can raise triglycerides and blood pressure and increase health and safety risks.

Consume moderately or avoid.

Other Considerations

- Fish oil supplements (1 g capsule daily, providing 200–800 mg omega-3) can help meet weekly needs (1500–2000 mg) to prevent heart disease.



Nutrition for Patients with Kidney Disorders



Nephrotic Syndrome



Nephrotic Syndrome Nutrition Therapy

- Nephrotic syndrome is a kidney disorder marked by heavy proteinuria, hypoalbuminemia, hyperlipidemia, and edema.

Goals

- Minimizes edema, proteinuria, and hyperlipidemia
- Raises serum albumin, lowers serum lipid levels, and slows kidney disease progression.
- Replace urinary nutrient losses.
- Reduce risks of renal damage and atherosclerosis.



Nephrotic Syndrome Nutrition Therapy

Key Recommendations:

- Sodium: Restrict to 2 g/day for edema/blood pressure control.
- Fluid: Restrict only if hyponatremia is present.
- Protein: Limit to 0.8 g/kg/day.
- Vitamin D: Supplement if deficient.
- Phosphorus/Calcium: Phosphorus allowance is based on lab values; limit calcium to 1000–1500 mg/day.



Chronic Kidney Disease (CKD)



Chronic Kidney Disease Nutrition Therapy

Goals:

- Reduce kidney workload and uremic toxin buildup.
- Maintain optimal nutritional status.
- Adjust diet based on symptoms and lab values with frequent monitoring.



Chronic Kidney Disease Nutrition Therapy

Protein and Energy

- Kidney decline impairs waste excretion; low-protein diets ease symptoms but risk protein-energy wasting (PEW).
Handwritten notes: 1, 2, 3, 4
- Dialysis increases protein needs by ~50% due to losses.
Handwritten note: 5
- Ensure adequate calories (35 kcal/kg for <60 years; 30–35 kcal/kg for older adults) to spare protein for synthesis.
Handwritten note: 6
- Peritoneal dialysis adds 340–680 kcal/day via dialysate; use sugars/fats to meet calories while limiting protein.
Handwritten note: 7



Chronic Kidney Disease Nutrition Therapy

Electrolytes and Fluid

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- Sodium/Fluid: Monitor via weight gain; fluid restriction is challenging in hemodialysis.
 - Potassium: Individualize based on serum levels (hyperkalemia risk with poor function; hypokalemia with dialysis/diuretics/vomiting/diarrhea).

Other

- Heart-healthy diet recommended (limit saturated fat, cholesterol, trans fat) due to accelerated atherosclerosis risk.



Self-Reading Review Questions



Quick question

What are the calorie recommendations for patients with chronic kidney disease?

- a. 40 cal/kg for adults younger than 60 years; 35 to 40 cal/kg for those who are older
- b. 35 to 40 cal/kg for all adults
- c. 35 to 40 cal/kg for adults younger than 60 years; 30 to 35 cal/kg for those who are older
- d. **35 cal/kg for adults younger than 60 years; 30 cal/kg for those who are older**



Which statement indicates the patient understands nutrition recommendations regarding carbohydrate intake?

- a. People with diabetes should avoid sugars and foods that contain sugars.
- b. It is important to consume the proper balance of starch, sugar, and fiber at each meal.
- c. **It is important to consume the correct amount of carbohydrate** at each meal and snack.
- d. Carbohydrates must be balanced in relation to the amount of protein and fat consumed.



What is the priority for preventing diabetes in people who are at high risk?

- a. Eat a low-carbohydrate diet.
- b. Consume a consistent amount of carbohydrate at every meal.
- c. **Achieve moderate weight loss through increased activity and lowered calorie and fat intake.**
- d. Eat a low-sugar diet.



Which statement indicates the patient understands the instruction about a DASH-style diet?

- a. The most important thing about a DASH diet is to eat less cholesterol. No egg yolks for me.
- b. **I need to eat more fruits, vegetables, and whole grains.**
- c. As long as I don't add salt to my food while cooking or at the table, I will be able to achieve a low-sodium diet.
- d. I had given up sugar-sweetened soft drinks but now I am going to go back to drinking them because they are allowed on my diet.



Which statement indicates the patient needs further instruction about diet for nephrotic syndrome?

- a. **“I know I need to eat a high-protein diet to replace the protein lost in urine.”**
- b. “I need to limit my intake of saturated fat and cholesterol.”
- c. “I should not use salt in cooking or at the table and avoid foods high in sodium such as processed foods, fast foods, convenience foods, condiments, and canned meat and vegetables.”
- d. I am going to try substituting soy protein for animal sources of protein because it may be better for me.”