

Renal Disease- Not on Dialysis

1. Purpose

a. Nutrition Indicators

Patients who have any type of chronic kidney disease are considered “at nutritional risk” and should be considered for this diet. Patients with a glomerular filtration rate between 13 mL/min/1.73m² and 50 mL/min/1.73m² are eligible to receive medical nutrition therapy as part of Medicare Part B (Academy of Nutrition and Dietetics, 2014).

b. Criteria to Assign the Diet

To assess nutritional risk, the following factors should be considered as increasing risk of chronic kidney disease:

- Diabetes
- Hypertension
- Infections
- Autoimmune disease
- Neoplasia
- Family history
- Medical history
- Loss of kidney mass
- Certain drugs
- Low birth weight

Certain populations may be at additional risk, so the following must also be considered:

- Age (60+)
- Environmental conditions
- Low income
- Low education
- Ethnicity- African American, Asian, Hispanic, Pacific Islander, American Indian

Assessing the patient to assign the diet includes measures for:

- Blood pressure
- Urinalysis
- Creatinine level
- Protein-to-creatinine ratio
- Hemoglobin

Some patients may also benefit from assessment using the following:

- Ultrasound imaging
- Serum electrolytes
- Urinary concentration or dilution
- Urinary acidification

(Academy of Nutrition and Dietetics, 2014)

c. Rationale for Diet

Before dialysis, providing medical nutrition therapy for chronic kidney disease can help slow the progression of the disease by preventing protein-energy-malnutrition and electrolyte imbalances and disorders, as well as reducing the impact of other diseases that may worsen the CKD, including diabetes, hypertension, obesity, and metabolic disorders.

Benefits of MNT include an improved quality of life, the potential to delay the progression of CKD and the corresponding drop in GFR, and improvement in biochemical and anthropometric measurements (Academy of Nutrition and Dietetics, 2014).

2. Population

a. Overview

“**Chronic kidney disease (CKD)** is a syndrome of progressive and irreversible loss of the excretory, endocrine, and metabolic functions of the kidney secondary to kidney damage.” (Nelms, 2011). The kidneys are important for removing toxins from the blood through filtration, thereby purifying it, controlling acid/base balance in the body, activating vitamin D and contributing to bone health, and producing erythropoietin needed for red blood cell formation (National Institutes of Health, 2011). Kidney disease is classified based on glomerular filtration rate, and sorted into stages, ranging from 1 (Kidney damage) to 5 (Kidney failure). Stage 5 generally requires some type of kidney replacement procedure, such as dialysis or kidney transplant. Many patients exhibit other comorbid conditions that contribute to their decreased kidney function, including hypertension, diabetes mellitus, and glomerulonephritis.

The stages of CKD are classified as follows:

Stages of CKD	GFR (mL/min/1.73 m ²)
Stage 1	≥90
Stage 2	60-89
Stage 3	30-59
Stage 3A	= 45-59
Stage 3B	= 30-44
Stage 4	15-29
Stage 5	<15

(NKF-KDOQI, 2002)

b. Disease Process

Common causes of CKD are hypertension and type II diabetes. Risk is made greater with African American ethnicity and family history of CKD. Diabetic nephropathy is a common cause of CKD in diabetic patients, which results in a thickening of the glomerulus, allowing more protein to pass into the urine and producing damage before any symptoms begin (National Institutes of Health, 2012). High blood pressure contributes to kidney disease because it can reduce

blood flow to the kidneys because of damaged blood vessels, as well as damaging the nephrons of the kidney, leading to kidney disease. Kidney disease then can further contribute to hypertension because the diseased kidneys cannot help regulate blood pressure (National Kidney Foundation, 2010). Other risk factors include cardiovascular disease, recent urinary tract infections, HIV infection, or other immunological diseases (National Institutes of Health, 2011).

Patients with both CKD and Diabetes have a high risk of losing kidney function, or experiencing a major cardiovascular event that may lead to death. Therefore, controlling cardiovascular disease risk factors is a key focus of early CKD treatment. If kidney function is lost, which may be likely as the disease progresses through the stages with a decrease in GFR, dialysis or other kidney replacement measures will have to be initiated. During the process, blood sugar and blood pressure need to be controlled to reduce the risk of developing other complications (National Kidney Disease KDOQI, 2007).

c. Biochemical and Nutrient Needs

3. General Guidelines

a. Nutrition Rx

Nutrient	Amount Per Day
Protein (g/kg)	0.60-0.75 g/kg ≥50% HBV
Energy (kcal/kg)	23-35 kcal/kg (for adults with CKD)
Na ⁺ (g/day)	<2.4 g/day to no added salt
K ⁺ (g/day)	<2.4 g/day
Phosphorus (mg/g pro)	800-1000 mg/day 10-12 mg/g pro Maintain serum P and PTH WNL
Calcium (g/day)	DRI- should not exceed 2g/day; Maintain serum levels WNL
Fluid (cc/day)	Usually unlimited, determined by input/output, medical status
Vitamins/Minerals (daily)	DRI: B-complex & C, ensure adequate nutritional vitamin D, give 1.25 as needed to control PTH, individualize iron, zinc

(United States Department of Agriculture, 2006)
(Academy of Nutrition and Dietetics, 2014)

b. Adequacy of Nutrition Prescription

The recommendation of a low-protein diet is based on evidence showing a decrease in GFR decline. Higher protein (0.8-0.9 g/kg body weight) is

recommended with the presence of diabetic nephropathy (Academy of Nutrition and Dietetics, 2014).

c. Goals

Goals are to maintain serum phosphorus and parathyroid hormone within normal limits, maintain calcium levels within normal limits, maintain normal fluid status, ensure adequate iron and zinc to prevent anemia, maintain or lose weight if necessary. Comorbid conditions such as diabetes or hypertension should be treated as necessary, while maintaining sodium, potassium, and phosphorus requirements.

(Academy of Nutrition and Dietetics, 2014)

d. Does it Meet DRI

Care should be taken to reach the DRI for B-complex vitamins, calcium, and vitamin D. Sodium, potassium, and phosphorus intake should correspond with recommendations for patients based on the stage of kidney disease. Nutrients that may not reach the DRI based on the nutrition prescription are vitamin D, iron, and zinc.

(Academy of Nutrition and Dietetics, 2014)

4. Education Material

a. Nutrition Therapy

Clients should understand the definitions of energy, protein, sodium, and other nutrients. They should understand basic dietary guidelines provided, and understand the significance of their laboratory results, food/drug interactions, blood pressure control, bone disease management, and anemia management (Academy of Nutrition and Dietetics, 2014).

There are certain diet components that should be monitored in the case of a renal patient in stage 3. Of particular concern are protein, sodium, potassium, phosphorus, calories, calcium, and vitamins and minerals such as B vitamins, zinc, and iron (Academy of Nutrition and Dietetics, 2012).

b. Ideas for Compliance

Sample menus and education on

5. Sample Menu

a. Foods Recommended

- High Biological Value Protein Sources
- Nondairy creamers, frozen desserts, dessert toppings, alternative milks
- Clear-colored soft drinks (diet for diabetics)
- Spices
- Low-salt items
- Calcium-containing vegetables
- If necessary to limit potassium:
 - Low-potassium fruits:
 - Apples

- Apple juice
- Applesauce
- Apricot nectar
- Blackberries
- Blueberries
- Cranberries (fresh)
- Cranberry juice
- Fruit cocktail
- Gooseberries
- Grape juice
- Grapes
- Lemon
- Lemon juice
- Lime
- Lime juice
- Papaya nectar
- Peach
- Pear
- Pineapple
- Plum
- Raspberries
- Strawberries
- Tangerine
- Watermelon
- Low-potassium vegetables:
 - Alfalfa sprouts
 - Bamboo shoots
 - Bean sprouts
 - Beets
 - Cabbage
 - Cauliflower
 - Corn
 - Cucumber
 - Endive
 - Eggplant
 - Green beans
 - Lettuce
 - Mushrooms
 - Onions
 - Radishes
 - Water chestnuts
 - Watercress

https://www.aakp.org/education/resourcelibrary/ckd-resources/item/foods-for-dialysis-patients.html?category_id=4

b. Foods to Avoid

- Processed foods

- Foods with high sodium content
- Canned iced teas
- Cola beverages
- Foods containing high saturated fat:
 - Butter
 - Bacon fat
 - Cream
 - Cream cheese
 - Lard
 - Sour cream
 - Whipped cream
- Meats with high levels of sodium and phosphorus:
 - Bacon
 - Sausage
 - Canned tuna, canned fish
 - Cheese
 - Canned, salted beans
 - Deli meats
 - Frankfurters or sausages
 - Ham
 - Organ meats
 - Vegetarian meat alternates
- Dairy and dairy products
 - Milk
 - Milk products
 - Evaporated milk
 - Pudding
 - Yogurt
- If necessary to limit potassium, avoid these fruits:
 - Apricots
 - Bananas
 - Dates
 - Honeydew melon
 - Kiwifruit
 - Nectarine
 - Orange
 - Orange juice
 - Prune juice
 - Raisins
- If necessary to limit potassium, avoid these vegetables:
 - Artichokes
 - Avocado
 - Bamboo shoots
 - Beets
 - Brussels sprouts
 - Chard

- Greens
- Kohlrabi
- Okra
- Parsnips
- Potatoes
- Pumpkins
- Spinach
- Sweet Potatoes
- Tomatoes
- Tomato sauce
- Tomato juice
- Wax beans
- Winter Squash
- Yams

c. Example of a meal plan

CKD with Diabetes Sample 1-Day Menu	
Breakfast	1/2 cup cranberry juice 1/2 cup low-fat, sugar-free yogurt 2 slices toast 2 teaspoons margarine 2 teaspoons jam, low-sugar 1 cup coffee, with sugar substitute
Lunch	2 slices whole-wheat bread 1 oz sliced turkey 2 leaves lettuce 1 slice tomato 1 tablespoon mayonnaise 1/2 cup cucumber slices 2 tablespoons oil and vinegar dressing 1 medium peach 10 small vanilla wafers 1 cup lemonade, sugar-free
Evening Meal	3 oz broiled fish 1 cup rice 1/2 cup green beans 1 cup tossed salad 1/3 cup low-sugar baked beans 1 tablespoon oil and vinegar dressing 1 dinner roll 1 teaspoon margarine 1/2 cup sugar-free orange gelatin 1 cup tea, iced and unsweetened
Evening Snack	1 slice pound cake (1/10th) 1/2 cup sliced strawberries 2 tablespoons whipped topping

(Academy of Nutrition and Dietetics, 2012)

6. Websites

a. Organizations with Websites

Suggested Foods for Dialysis Patients:

https://www.aakp.org/education/resourcelibrary/ckd-resources/item/foods-for-dialysis-patients.html?category_id=4

Nutrition and Chronic Kidney Disease

https://www.kidney.org/atoz/pdf/NutriKidFail_Stage1-4.pdf

Salt-Free Seasonings

http://www.kidney.org/patients/kidneykitchen/content/salt_free_seasonings.cfm

American Kidney Fund

<http://www.akfinc.org/>

Life Options- Kidney Info

<http://lifeoptions.org/kidneyinfo/>

b. Government Websites

CDC- Kidney Disease

<http://www.cdc.gov/nchs/fastats/kidbladd.htm>

NIDDK- Kidney Disease Information

<http://www.niddk.nih.gov/research-funding/at-niddk/labs-branches/kidney-disease-branch/kidney-diseases-section/glomerular-disease-primer/kidney-disease/Pages/kidney-disease.aspx>

National Kidney Disease Education Program

<http://nkdep.nih.gov/>

7. References

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Manual: www.nutritioncaremanual.org

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2014 4-February from eatright.org:

<http://www.eatright.org/Public/content.aspx?id=4294967540>

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http://fnic.nal.usda.gov/fnic/interactiveDRI/dri_results.php