



Harvard Vanguard
Medical Associates
Atrius Health

NUTRITION AND CHRONIC KIDNEY DISEASE

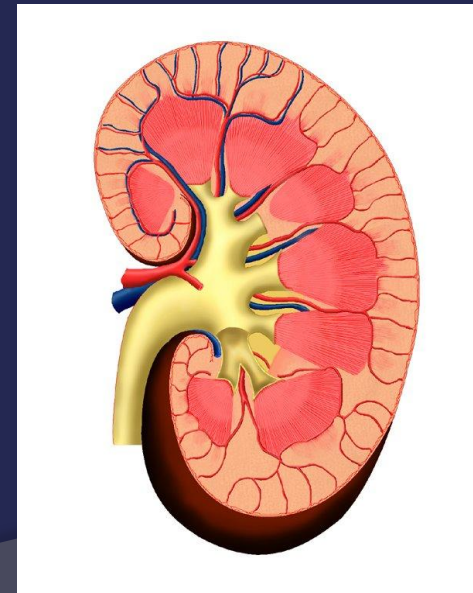
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Content

- ① **Basics of Kidney**
- ② **What Should You Eat for Your Chronic Kidney Disease (CKD)?**
- ③ **Is Herbal Supplement Beneficial or Harmful for CKD?**

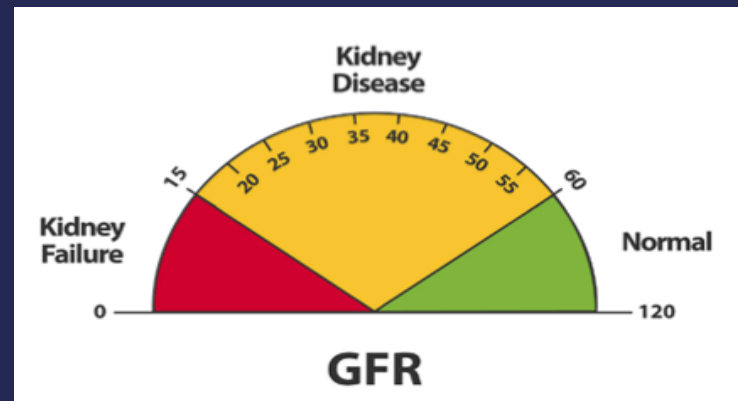
Basics of Kidney

- ⦿ **Maintain homeostatic balance**
 - Fluid
 - Electrolytes
- ⦿ **Excretion of metabolic waste**
 - Urine
- ⦿ **Produce hormones**
 - Renin
 - Erythropoietin
 - Vitamin D



Basics of Kidney

- Measurement of Kidney Function
 - Glomerular Filtration Rate (GFR): GFR is measure of how well your kidneys filter blood
 - Use estimated GFR called " eGFR".
- Stages of Chronic Kidney Disease (CKD)
 - 5 stages (1-5)
 - Stage 3- 5



CKD Stages

Stage	Description	eGFR
1	Kidney damage but normal eGFR	90 or more
2	Kidney damage with mild decrease of eGFR	60 - 89
3	Kidney damage with moderate decrease of eGFR	30 - 59
4	Kidney damage with severe decrease of eGFR	15 - 29
5	Kidney failure: need renal replacement therapy	Less than 15
5D	Dialysis	

CKD Risk Factors

- ⦿ **Diabetes**
- ⦿ **Hypertension**
- ⦿ **Family history of kidney failure**
 - Polycystic kidney disease (PKD)
- ⦿ **Cardiovascular disease**
- ⦿ **Prolonged consumption of over the counter medication (i.e. ibuprofen) or herbal supplements (Aristolochic acid, Echinacea, Creatine, Chromium, Cat's claw)**

What is Healthy Eating for CKD?

◎ Purpose

- To maintain good nutritional status
- Slow progression of CKD
- To treat complications

◎ Key Diet Components

- Controlling blood pressure: Low sodium intake
- Reducing protein intake if EXCESS
- Managing diabetes

**There is no DIET call “RENAL
DIET”**

**What Should I Eat
with My CKD???**

**Everything is Individualized
Based on your own Medical
Problems**

In General

- ⦿ **Low Sodium**

- ⦿ **Low Potassium**

- Is your blood potassium level high?
- Do you take medication called “ACEI or ARB”?

- ⦿ **Moderate Amount of Protein**

- Do you spill protein in urine?

- ⦿ **Low Phosphorus**

Low Sodium Diet

- ⦿ **What does sodium do in the body?**
 - Thirst
 - Fluid gain
 - Increase blood pressure
- ⦿ **How much sodium should I take a day?**
 - Please choose
 - **1 Table spoon of salt**
 - **1 teaspoon of salt**
 - **2000mg of sodium**

Low Sodium Diet

- Nutrition Label
- What should you read?
 - Portion size
 - Servings per container
 - Nutrients
 - Calories
 - Protein
 - Fat (total, saturated fat, trans fat)
 - Cholesterol
 - Carbohydrates (sugar, fiber)
 - Vitamins and Minerals
 - Sodium
 - Your restriction
 - Healthy population

Nutrition Facts	
Serving Size 1 cup (228g)	
Servings Per Container 2	
Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 3g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Portion Size

Number or servings per Container

Sodium

Sodium Recommendation For Healthy People

Nutrition Facts

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Servings Per Container 2

Amount Per Serving

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% Daily Value*

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Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	

Vitamin A	4%
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Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Low Potassium

- What is normal potassium level?
- Do you take medication called “ACEI or ARB”?
 - What are these?
 - ACEI: Angiotensin Converting Enzyme Inhibitor
 - Lisinopril, Enalapril
 - ARB: Angiotensin Receptor Blocker
 - Avapro
 - Why do you need this meds?
- What is your potassium level?



What is Normal Potassium Level?

⦿ Safe Zone

- 3.5 – 5.0 (mmol/L)
- Harvard Vanguard Medical Associate: 3.3 – 5.3

⦿ CAUTION

- 5.1 (5.4) – 6.0

⦿ DANGER

- Greater than 6.0

To Keep Potassium Level in Safe Zone

- ⦿ Limit high potassium foods
- ⦿ Eat a variety of foods in moderation
- ⦿ Modify cooking methods to lower potassium content of the foods
- ⦿ Do not drink or use the liquid from canned fruits or vegetables
- ⦿ Remember portion size!!



High Potassium Foods

Food	Amount	Potassium (mg)
Fruits, Dried Fruits and Fruit juices		
Avocado	1/4	149
Banana	1/2 or 7"	422
Cantaloupe	3/4 cup (1/8)	320
Dates	1/4 c	292
Honeydew	3/4 cup (1/8)	303
Kiwi	1	237
Mango	1	323
Nectarine	1	277
Orange	1	237
Prunes	1 cup	796
Raisins	1/4 cup	272
Orange Juice	8 floz	496
Prune Juice	8 floz	706

High Potassium Foods

Food	Amount	Potassium (mg)
Other Foods		
Chocolate	1 bar (1.5 oz)	150
Granola	½ cup	330
Milk (all type)	8 fl oz	348
Yogurt	8 oz	380
Organ meat	3 oz	340
Molasses	1 Tbsp	292
Nuts and seeds	1 oz	206
Peanut butter	2 Tbsp	207
Lite salt	¼ tsp	354



Low Potassium Foods

Fruits	Vegetables	Other foods
<p>Apples – 1 Applesauce Apricots (fresh) – 1 medium (canned) – ½ cup Blackberries Blueberries Cherries Cranberries Fruit Cocktail Grapefruit – ½ Grapes Mandarin Oranges Peaches (fresh) – 1 small (canned) – ½ cup Pears (fresh) – 1 small (canned) – ½ cup Pineapple Raspberries Strawberries Tangerines – 1 Watermelon – 1 cup Apple, cranberry, grape, grapefruit and pineapple juice\</p>	<p>Alfalfa Sprouts Asparagus – 6 spears Beans: green or wax Bean Sprouts Beets, cooked Cabbage Carrots, cooked Cauliflower Celery – 1 stalk Corn Cucumber Eggplant Kale Lettuce Mixed Vegetables Mushroom – fresh Okra Onions Parsley Peas, green Radish Rhubarb Squash (summer, zucchini)</p>	<p>Rice Noodles Pasta Bread and bread products – not whole grain Cereals – not bran or whole grain Cake – not carrot or chocolate Coffee – limit 1 cup Cookies – without nut or chocolate Pies – without chocolate or high potassium fruits Tea – limit 2 cups</p>



Low Potassium Diet

- ⦿ Know your potassium level
- ⦿ Know your current medications
 - ACEI
 - Diuretics (water pill)
- ⦿ Watch very high potassium foods and portions
- ⦿ Ask your dietitian

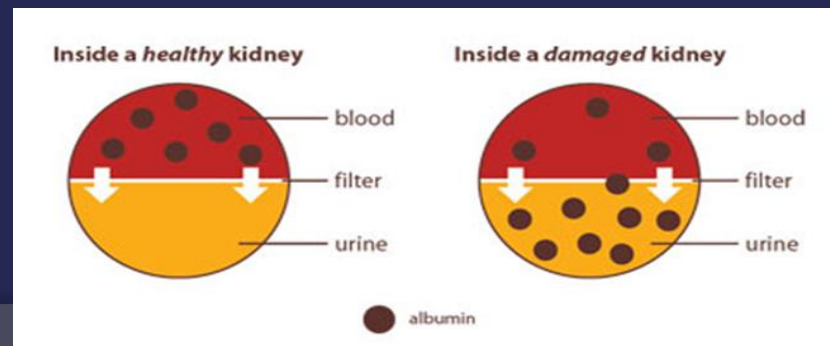


Protein

- ⦿ **What is protein?**
 - **Essential nutrient in the body**
 - **Growth**
 - **Build muscles**
 - **Repair tissues**
- ⦿ **Why do you concern protein with CKD?**
 - **Body uses protein and produce waste product called “urea” which is removed by kidney**
 - **In CKD, urea accumulate in the body**

Protein

- ⦿ What are protein sources?
 - High biologic value protein(HBV): animal products
 - Low biologic value protein (LBV): plant products
- ⦿ Do you spill protein in the urine?
 - Amount of protein in the urine determine whether you should restrict protein



Protein

- ⦿ **How much should I eat protein daily?**
 - **0.8 – 1.3gm/kg/body weight/day**
 - **Half (50%) to 2/3 (67%) should come from HBV protein foods**

- ⦿ **DO NOT FOLLOW LOW CARBOHYDRATE HIGH PROTEIN WEIGHT LOSS DIET**

Protein

- ⦿ **Be sure to eat all of the servings of protein in your diet plan**
- ⦿ **Eat enough calories to avoid your body using protein as an energy source**
- ⦿ **Portion size is important**
- ⦿ **Meat, fish and poultry must be measured after cooking without bone, skin or fat**
- ⦿ **Consult with your renal nutritionist before you start low protein diet**

Phosphorus

- ⦿ **What is phosphorus?**
 - **Mineral that helps bone healthy**
 - **Keep blood vessels and muscles working**
- ⦿ **Why should you watch phosphorus in CKD?**
 - **Phosphorus can build up in the blood vessels, making bones thins, weak and break**

Phosphorus

- ◎ **What foods are high in phosphorus?**
 - All foods rich in protein especially dairy products, organ meats
 - Beans, bran products, nuts and seeds
 - Dark soda (cola, root beer) and bottled iced tea
- ◎ **What foods are low in phosphorus?**
 - Fresh fruits and vegetables
 - Rice milk (if not enriched)
 - Bread, pasta and rice
 - Corn and rice cereals



Phosphorus

- ⦿ Do not consume excess protein in your diet
 - Meat, poultry, fish
 - Dairy foods: 1 cup milk or 1 oz cheese max
- ⦿ Eat more fresh fruits and vegetables
- ⦿ Many packaged foods contain additives containing phosphorus: **READ LABEL** and avoid for words with **PHOS**

Ingredients: Potatoes, vegetable oil (partially hydrated soybean oil), salt, dextrose, disodium dihydrogen pyro**phosp**ate

Vitamins and Mineral Supplement

Do you need supplements?

Vitamins and Mineral Supplement

⦿ **Multivitamin and Minerals**

- Usually good for most patients
- MVI for women: be careful for mineral especially calcium



⦿ **Vitamin D**

- Most people living in Northeast of the US have vitamin D insufficiency or deficiency
- Take over the counter vitamin D3 if you are insufficient but not with other minerals such as calcium, magnesium etc

⦿ **Calcium**

- Most postmenopausal women take calcium supplement however be careful with CKD
- DO NOT take Tums of calcium containing Antacid if you have high calcium level



Vitamins and Mineral Supplement

⦿ Vitamin C

- High dose $> 1000\text{mg}$ is not good because of risk of kidney stone



⦿ Fish oil

- Not harmful and maybe useful for IgA nephropathy



⦿ Glucosamine and Chondroitin

- Not beneficial but not harmful



HERBAL SUPPLEMENTS

Are They Beneficial or Harmful?



Herbal Supplements

- ⦿ Herbal supplement manufacturers DO NOT have to get approval from the Food and Drug Administration (FDA) before putting the products on the market
- ⦿ Over 7,000 herbal supplements in late 1990's
- ⦿ Are they safe?
 - FDA is monitoring the safety once they are on the market
 - It may be harmful to use with prescription meds

Herbal Supplements

- ◎ **How to know what's in an herbal supplement?**
 - Name of herbal supplements
 - Name and address of manufacturer
 - Complete list of ingredients and serving size
- ◎ **How to know if herbal supplement's claims are true?**
 - Ask your doctor or pharmacist
 - Look for scientific research findings
 - Contact manufacturer

Herbal Supplements

- ◎ **Who shouldn't use herbal supplements?**
 - **You are taking prescription or over the counter (OTC) medications**
 - **You are pregnant or lactating**
 - **You are having surgery**
 - **Children (< 18 years old) or elderly**
 - **You have chronic medical problems such as CKD**

Herbal Supplements

- ◎ **Safety tips for using herbal supplements**
 - **Follow supplement instructions**
 - Don't take extra dosage
 - **Keep track of what you take**
 - How long and how much
 - **Be extra cautious about supplements manufacturer outside the USA**
 - China, India and Mexico
 - **Avoid products with tainted past**
 - Most weight loss pills
 - **Check alerts and advisories**
 - FDA regulatory review

Herbal Supplements: Harmful for the Kidney

- **Aristolochia serpentaria (Snakewood)**
- **Chromium picolinate**
- **Echinacea**
- **Bladderwrack**
- **Germanium**
- **Wormwood oil**
- **Salix daphnoides (willow bark)**
- **Uncaria tomentosa (cat's claw)**
- **Pausinystalia yohimbe**
- **Chaparral**
- **Cranberry**
- **Licorice**



Herbal Supplements: Harmful for the Kidney

Common Name	Claims	Renal problems and other side effects
Aristolochic Acid (Snakewood)	Anticonvulsant, aphrodisiac, menstrual stimulant	Acute kidney failure Vomiting, gastroenteritis Muscle spasms
Bladderwrack	Weight loss, thyroid disorder, antibiotic, antioxidant	Polyuria, proteinuria Hyperthyroidism, goiter Gast disturbance, diarrhea
Cat's claw	Dyspepsia, ulcer, anti-inflammatory	Acute nephritis Diarrhea, hypotension, bleeding gums
Chaparral	Antioxidant, anti-inflammatory	Renal cyst Rash, liver failure
Chromium picolinate	Weight loss, hypoglycemic	Acute and chronic nephritis Anemia, cognitive dysfunction Hemolysis, hepatic dysfunction

Herbal Supplements: Harmful for the Kidney

Common Name	Claim	Renal problems and other side effects
Cranberry	Urinary tract infection	Kidney stone Nausea, diarrhea, dehydration
Echinacea	Upper respiratory infection	Acute renal failure Fever, drowsiness, headache nausea, vomit, abdominal pain
Germanium	Immunostimulant, anti inflammatory	Minor renal abnormalities Anemia, muscle wasting
Licorice	Peptic ulcer, lupus, infection	Renal injury, acute renal failure Amenorrhea, lethargy, pulmonary edema, weakness
Wormwood oil	Appetite stimulant, heartburn	Acute renal failure Nausea, vomit, muscle ache

Summary

- ⦿ **There is no Renal Diet**
- ⦿ **CKD diet should be individualized on your own medical condition**
- ⦿ **Herbal supplement should be used with caution**

Thank you

