



# Diet and Lifestyle for Healthy Kidneys

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Osher Mini Med School  
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# Disclosures

- Site PI for Kadmon, Reata, Sanofi-Genzyme trials in PKD
- Advisory board Otsuka Pharmaceuticals
- Consultant for Abalone Bio
- Spouse works for Merck

# Outline

- What are the health outcomes we are trying to prevent with a healthy diet and lifestyle?
- Brief overview of some common diets
- General guidelines
- Discussion

# Disclaimer

- These are general recommendations that integrate data with common sense and should NOT take the place of a formal registered dietitian / medical evaluation
- Nutrition science is an evolving field and I am a nephrologist – not a dietitian
- Patients with clinical chronic kidney disease may have different requirements depending on disease severity

# Case 1

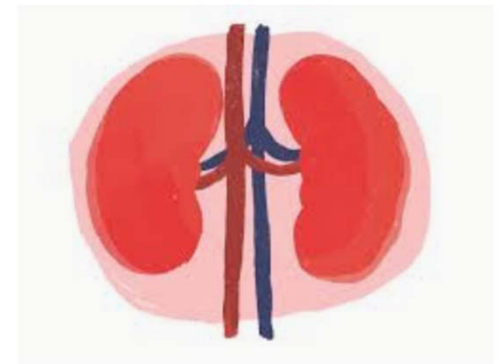
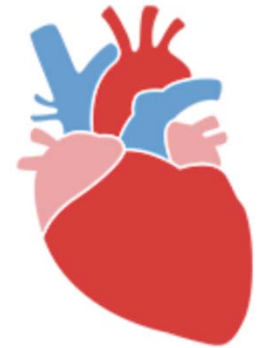
- 52 year old gentleman with high blood pressure, kidney stones, obesity (BMI 34), knee pain
- This patient does NOT currently have kidney disease as assessed by blood or urine tests
- He could be at risk for kidney disease due to high blood pressure, kidney stones, obesity, and risk of diabetes

# Case 1 diet

- Coffee, bagel in the morning
- Instant ramen noodles for lunch
- Steak and potatoes for dinner
- Eats out at restaurants frequently
- Not sure how much water he drinks

# What are the health outcomes we're trying to accomplish?

- Prevent
  - Heart disease
  - Stroke
  - Kidney disease
  - Diabetes
  - High blood pressure
  - Obesity
  - All of these are intertwined with each other



# Some strategies

- Follow heart healthy diet
- Maintain a healthy weight
- Healthy lifestyle habits



# Blood pressure categories: for most healthy adults without diabetes and under age 65

- Normal  $< 120 / 80$
- Borderline (130-139)/(80-89)
- Hypertension  $> 140 / 90$

# Obesity categories

- Normal: 18.5-24.9
- Overweight: BMI 25-29.9
- Class 1 (low risk): BMI 30-34.9
- Class 2 (moderate risk): BMI 35-39.9
- Class 3 (high risk): BMI  $\geq 40$
  
- BMI calculator:  
[https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm)

# Dietary Sodium and Health

## More Than Just Blood Pressure

### ABSTRACT

Sodium is essential for cellular homeostasis and physiological function. Excess dietary sodium has been linked to elevations in blood pressure (BP). Salt sensitivity of BP varies widely, but certain subgroups tend to be more salt sensitive. The mechanisms underlying sodium-induced increases in BP are not completely understood but may involve alterations in renal function, fluid volume, fluid-regulatory hormones, the vasculature, cardiac function, and the autonomic nervous system. Recent pre-clinical and clinical data support that even in the absence of an increase in BP, excess dietary sodium can adversely affect target organs, including the blood vessels, heart, kidneys, and brain. In this review, the investigators review these issues and the epidemiological research relating dietary sodium to BP and cardiovascular health outcomes, addressing recent controversies. They also provide information and strategies for reducing dietary sodium. (J Am Coll Cardiol 2015;65:1042-50) © 2015 by the American College of Cardiology Foundation.

# The DASH Diet for Healthy Blood Pressure

Follow these DASH (Dietary Approaches to Stop Hypertension) guidelines for a healthier, more balanced diet



 **OhioHealth**

Discover how the DASH Diet can help you manage your blood pressure at [blog.ohiohealth.com](http://blog.ohiohealth.com)

# DASH diet

- Dietary Approach to Stop Hypertension
- Low sodium (1500-2000 mg/day)
- High in whole grains / vegetables / fruits / low-fat dairy (calcium, magnesium, potassium)
- Low animal protein
- Low refined/simple carbohydrates, sugar (including sugary beverages)
- Low saturated and trans fat (<25% dietary intake from fat)

# DASH diet

- Fruits / veggies - 8 or more servings per day
- Low fat / non-fat dairy – 2-3 servings per day
- Nuts, seeds, dried beans - 4-5x per week
- Whole grains / fiber
- Lean meat, fish, poultry – 6 ounces or less daily
- Moderate plant fats and oil

# Heart Healthy diet

- "Mediterranean" diet
- Whole plant foods
  - Fruits, veggies, whole grains
  - Beans, lentils
  - Nuts, seeds
- Healthy fats – olive oil
- Water
  
- Decrease: animal foods, processed foods, soda and sugary drinks

# Healthy fats

- Unsaturated fats
- Olive oil, canola oil
- Nuts, seeds, natural nut butters
- Avocado, olives
- Omega 3 fatty acids – fatty fish, flax seed, walnuts





# Protein intake

- Too much dietary protein is dangerous for people with overt kidney disease
- Some data suggest that animal protein is harder to handle than vegetable protein
- Soy protein - anti-inflammatory; beneficial in animal models
- Avoid protein shakes if CKD – in general the “real thing” is preferred

# High protein diet

- May have a benefit for satiety
- May reduce risk of hip fracture
- Associated with progression of kidney disease in individuals with EXISTING kidney disease but not clear in healthy individuals weight risks/benefits of weight loss
- May be a concern in older individuals depending on kidney function
- May increase risk of kidney stones

# Ketogenic diet

- Very low-carbohydrate, high-fat -> carbohydrate starvation
- Based on meta-analysis, may be more effective than low-fat diet for long-term weight loss ( $\geq 12$  months)
- BUT high saturated fat is a concern

# Vegan diet



- No animal products
- Meta-analysis of vegetarian diet showed benefit for ischemic heart disease and cancer (colorectal, breast, prostate, lung)
- Vegan diet reduced risk of cancer
- Some believe vegan diet may reduce kidney disease risk
- BUT important to make sure nutrients are balanced and this can be challenging

# Low carb diet

- Restricts grains, fruits, some veggies, dairy, legumes
- Focus on poultry, fish, eggs, nonstarchy veggies
- Generally goal to limit to 20-60 grams carbohydrates per day, or 80-240 calories (regular carb is 900-1300 calories)
- Weight loss in the short term but not necessarily long term

# Case 1

- 52 year old gentleman with high blood pressure, kidney stones, obesity (BMI 34), knee pain
- This patient does NOT currently have kidney disease as assessed by blood or urine tests
- He could be at risk for kidney disease due to high blood pressure, kidney stones, obesity, and risk of diabetes

# Dietitian recommendations, case 1

- Reduce sodium (1500-2000 mg/day) - Label reading review, improve eating out choices
- Meal planning based on heart healthy plate method and DASH study - Increase fiber/plant foods 5-10 servings/day, limit saturated fats
- Adequate calcium intake - 2 servings/day low/nonfat dairy, 30% fortified
- RDA protein - 1/4 plate servings ( 8-10 oz/day) lean, lowfat, plant sources
- Less starch more non-starchy vegetables to help reduce total carbohydrates
- Increase free fluids - 6-8 cups/day - Limit liquid sugars for weight management
- Regular movement - Begin walking - 20", 3x/wk+, as tolerated - Goal is 60" or more on most days for weight management
- Maintain healthy weight with moderate energy intake & regular exercise

# Quick aside re: Case 1

- Knee pain – maybe patient takes ibuprofen / non-steroidal anti-inflammatory medications
- In people with healthy kidneys, this is generally OK
- BUT can cause problems in people with kidney problem



## Case 2

- 67 year old woman with diabetes and chronic kidney disease (approximate kidney function 23% of normal)
- Weight 108 kg, BMI 39
- Wants to get a kidney transplant from a living donor

# Patient's diet

- Drinks 4 liters water per day
- Potassium restriction due to high potassium values noted on her labs
- Low carb for weight loss and diabetes
- Very anxious about diet

# BMI criteria for transplant

- Patients will not be transplanted if BMI > 34
- Patients WILL NOT BE SCHEDULED if:
- Dialysis patients
  - Diabetic with BMI>36
  - Nondiabetic with BMI>=40
- Pre-dialysis
  - BMI > 40

# Potassium in CKD

- In general, potassium is found in very healthy foods (fruits, vegetables) and may be associated with BETTER outcomes in diabetes and CKD (early stage)
- But, as kidney function declines, ability to handle potassium goes down, and must restrict

# Phosphorus in CKD

- Found in dairy products
- Goes hand in hand with protein
- Also often found as an additive or preservative
- Can be challenging to lower this from diet alone

# Weight loss in CKD

- **Low potassium vegetables** (1 cup serving size): iceberg lettuce, raw cabbage, cucumbers, cauliflower, onions, bell peppers, radishes, celery, carrots, and Chinese pea pods.
- **Low potassium fruits:** apples, mandarin oranges, grapes, pineapple (in own juice if not fresh), pears, blueberries, strawberries (limit 1 cup a day), blackberries, raspberries and fresh plums (limit 2 plums a day).

*Source: National Kidney Foundation*

# Dietitian recommendations, case 2

- Pre-dialysis nutrition guidelines for CKD: 1) Reduce sodium - Label reading review; 2) RDA protein; 3) Meal planning based on plate method; 4) Choose low potassium, phosphorus food
- Continue walking - 20"+, 3x/wk+, as tolerated
- Recommend to discuss renal diet restrictions with MD in accordance with lab values – reduce water intake for hyponatremia (abnormal low sodium level on blood tests)

# What about beverages?

- Water - Known benefit for kidney stones; "flushing out the kidney" is not really a true phenomenon in normal OR CKD
  - In general, guidance by thirst is reasonable in CKD
  - In healthy individuals:
    - Men 3-4 liters / day, women 2-3 liters / day
- Coffee – up to 400 mg/day caffeine (3-5 8oz cups per day) may be beneficial
- Alcohol – limit 1 drink / day women, 2 for men
- Sweetened beverages: avoid
- Carbonated water – same as water except dentists recommend rinsing your teeth due to acidity



# Supplements?

- Fish Oil
- Turmeric / curcumin
- Vitamin D3

# Exercise

- Goal 150 minutes or more of moderate-intensity activity per week
- 20-30 minutes EVERY DAY – can break it up!
- Usually not sufficient to accomplish weight loss from exercise alone BUT is very important for cardiovascular health!
- Helps stress, sleep, well-being
- Team up with a friend, take the stairs, use a pedometer
- Generally health screen prior to exercise not needed if you do not have chronic disease or concerning symptoms like shortness of breath, chest discomfort

# Some interesting kidney-healthy foods to try

- Salt sources: sea salt, miso, sauerkraut, tamari
- Beans: lentils, black beans
- Berries: blueberries, blackberries
- Fish: shrimp, deep-sea fish (limit to 2 servings/week to reduce mercury exposure)
- Nuts: walnuts, chestnuts (unsalted)
- Veggies: asparagus, dark green leafy (kale), seaweed, onions, sweet potato, celery, string beans, root vegetables
- Herbs: ginger, black pepper, cumin
- Miscellaneous: nettles, spirulina, kelp, wheatgrass

*Source: Dr. Jennifer Ashby, UCSF Osher Center*

# Healthy diet lifestyle: summary

- Diet – DASH, moderation, no extreme fads
  - Maintain healthy weight
  - Physical activity
  - Adequate fluids
  - Limit alcohol, no sugary beverages
  - NO SMOKING!!!
  - Manage stress
- 
- These guidelines may differ based on chronic kidney disease or other health conditions

# Thank you!

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