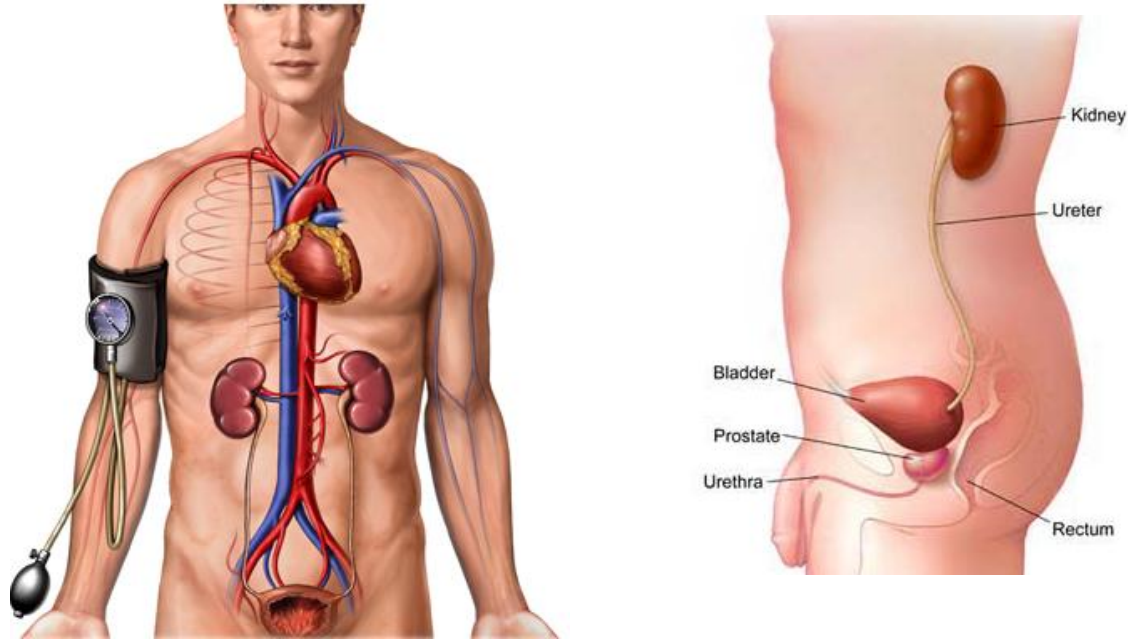


What do you need to know about your kidney?

Li-Li Hsiao M.D., Ph.D
Director of Asian Renal Clinic
Renal Division, Brigham and Women's Hospital
Harvard Medical School

Kidney Basic

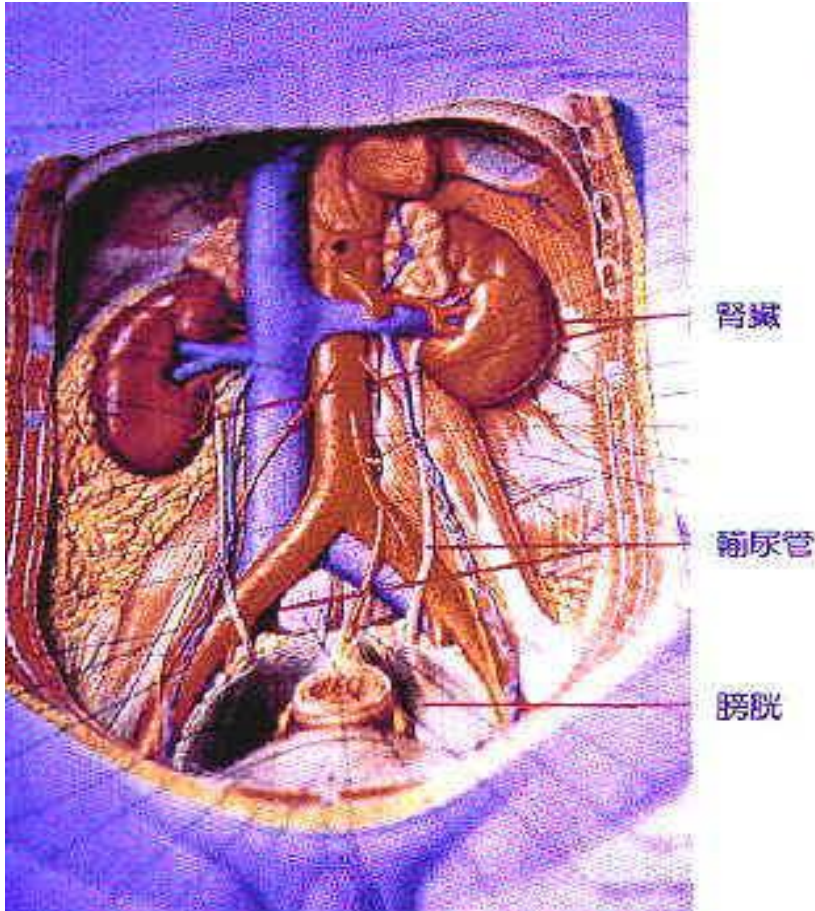


- The kidneys are located in the back of the abdomen, one on each side of the spinal column, at about the level of the lower ribs.
- The average weight of an adult human kidney is approximately one-quarter pound.
- Each kidney is approximately 4 inches long, 2.5 inches wide, and 1.5 inches thick.

Kidney Basic

- The kidney receives about 20-25 % of the blood coming from the heart each time it beats.
- The rate of blood flow through both kidneys is approximately 1.2 liters per minute (~1500L/day)
- approximately 180 liters of liquid which are filtrated out of the blood daily, there are only about 2 or 3 liters of urine which land in the bladder.

Functions of the Kidney



- Filter and excrete body waste products
- Secrete water
- Maintain balance of electrolytes and salts
- Maintain acid-base (pH) balance in the blood and urine
- Produce hormones that control blood pressure, red blood cell production, Vitamin D, and Calcium balance

What can cause kidney injury?

Diseases that commonly Cause Kidney Injury

Diabetes

Deterioration of kidney function happens 15-20 years after the onset of diabetes

Hypertension

High blood pressure damages blood vessels in the kidney

Glomerulonephritis

Kidney injury that is not caused by bacteria. Main symptom is protein and /or blood in urine.

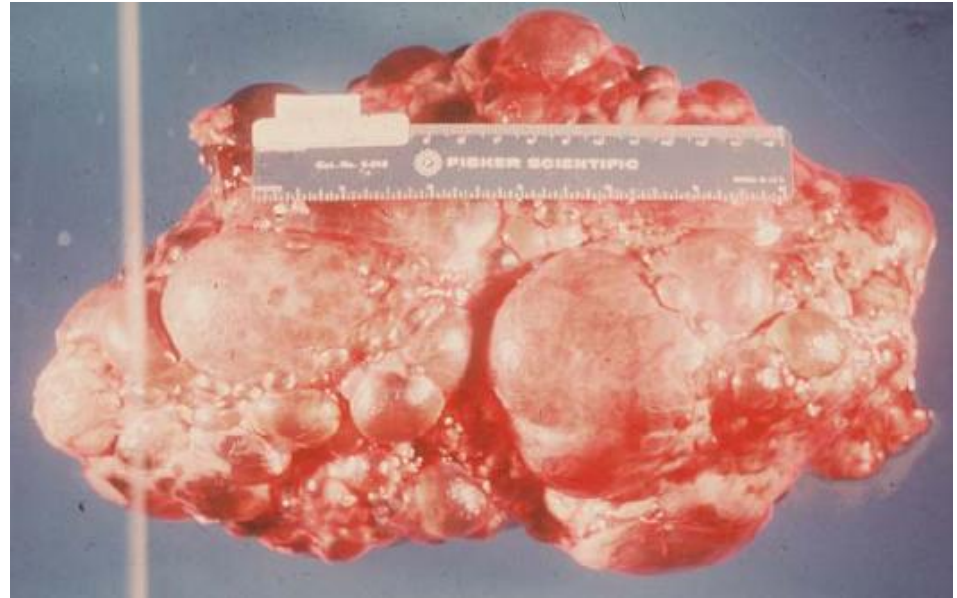
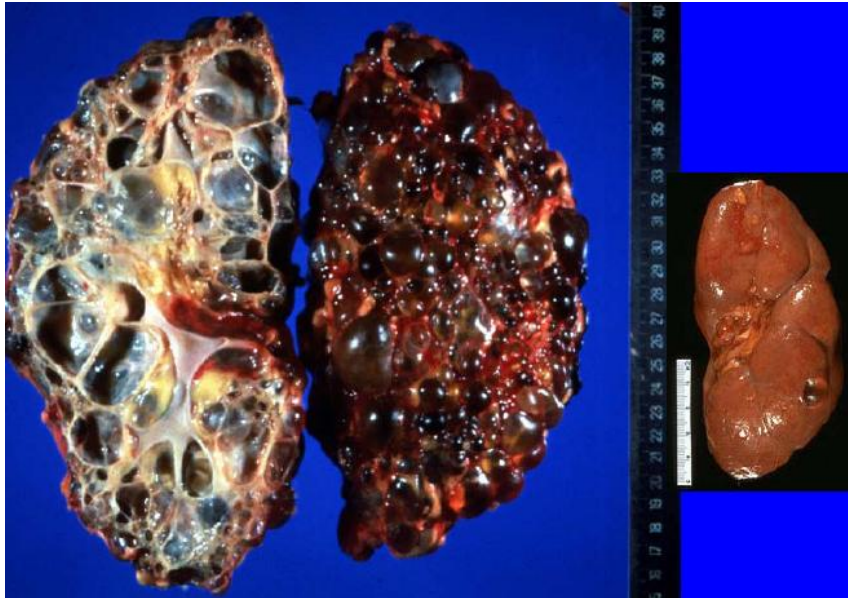
Diseases that commonly Cause Kidney Injury

Obesity: is associated with

- Hypertension
- Diabetes
- Kidney failure
- Proteinuria
- Snore → obstructive sleep apnea (OSA)

Diseases that commonly Cause Kidney Injury

- **Polycystic kidney disease (PKD):** The most common genetic kidney disease. 1:500-1:1000 live birth.



Diseases that commonly Cause Kidney Injury

- **Interstitial Nephritis:** antibiotics, contrast, painkiller such as mortrin, ibuprofen, aleve, advil, bufferin etc.
- **Kidney stones**
- **Obstruction of urinary tract:** such as stones, tumors, enlarged prostate
- **Gout :** uric acid stone causing obstruction, or uric acid precipitation due to painkillers.
- **Congested Heart Failure**
- **Lupus**
- **Others:** chemicals, heavy metals, cocaine, heroin, methanol, Isopropyl alcohol *etc.*

How do you know
you have kidney
problem?

Normally, you don't know
until your doctor tell you

Detection of Kidney Disease

Blood test

Blood creatinine level increased and glomerular filtration rate (eGFR) decreased as kidney function deteriorates.

Urine test

To test the presence of protein and/or blood in urine. Individuals with healthy kidneys do not have proteins *and/or blood* in urine.

Two kinds of kidney diseases

Acute

Early detection and appropriate treatment can cure completely

Chronic

kidney damage cannot be reverted

Warning Signs of Kidney Injury

Back pain

Hypertension

Edema – swelling

Hematuria – blood in urine

Polyuria – frequent urination

Dysuria – painful or difficult urination

5 stages of kidney function

Stage 1 and 2

mild kidney damage – Kidney maintains 60% of normal functioning

Stage 3 and 4

moderate kidney damage – Kidney maintains 15~59% of normal functioning

Stage 5

late-stage renal failure – Kidney only has *less than* 15% of normal functioning.

Kidney failure



Uremia Symptoms



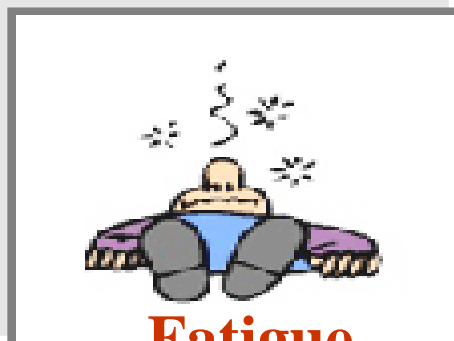
Anemia



Hypertension



Edema



Fatigue



Vomit



Poor appetite

Other systems : nerve 、 heart 、 lung 、 bone marrow 、 GI 、 endocrine 、 skin 、 bone etc.

Treatments When Kidney Fail

Hemodialysis

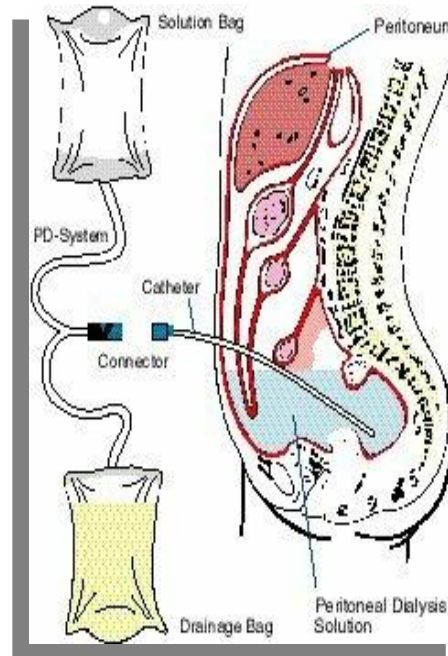
In-Center
3 times /week



Home
6 days /week



Peritoneal
Dialysis



Kidney
Transplant



**Kidney disease
can be prevented**

Eight Steps To Kidney Health

1 : *Proper Medications*

The metabolism and *excretion* of *many* medicines depend on kidney. *Incorrect* medicine intake taxes the kidney.

Western medicines

Painkillers such as *Mortrin, Ibuprofen, Advil, Aleve, Bufferin etc.* can potential causing injury to kidney

Herbal medicines

FDA banned herbs containing *aristolocholic acid* (馬兜玲酸) These include 防己、木通、細辛、威靈仙、馬兜鈴 and 天仙藤

Some might also contain lead, mercury and other heavy metal.

2 : Healthy diet- Protein

- People who consume too much protein are 3.5 times more likely to develop kidney disease.
- Suggested daily amount is *0.8-1.2 gm protein/Kg body weight*. Combination of high biological value (HBV) protein and non-HBV protein
i.e. 70 Kg body weight = 56-84 gm protein = 7-10 servings.

Each serving (7-8 gm):

HBV= 1 glass of milk (5-8 oz) or half palm sized meat.

Non-HBV= one bowl of rice or 4 slices bread

2 : Healthy diet- Low Salt

- 95% of consumed salt are secreted out by the kidney, so excessive salt intake taxes the kidney.
- Suggested daily amount is 8 grams.
- As average daily amount of food naturally contain salt, only 1 teaspoon of additional salt should be added to food.

3: Hypertension and diabetes

High blood pressure and diabetes increases the chance of developing kidney disease 2 and 1.5 times, *respectively*

Control 3 Highs

High blood sugar (*HbA1C* below 6.5%)

High cholesterol (*LDL* under 100 mg/dl)

High blood pressure (below 130/80 mmHg)

Regular exercise

5 days a week, 30-60 mins per day

Balanced diet

low levels of fats, sugars and calories

Urine test once every half a year

4 : Drink Fluid

Water/fluid stimulates body's natural metabolism, helpful in ridding wastes such as urea. Also helpful in ridding kidney stones.

Suggested daily water/fluid intake is 2 liters. This is equivalent to 64 oz of water/fluid.

Others

5. No cigarette smoking

6. Keep warm during cold weather

7. Avoid viral or bacterial infection or seek early treatment

8. Quality of Drinking Water-avoid using PVC container