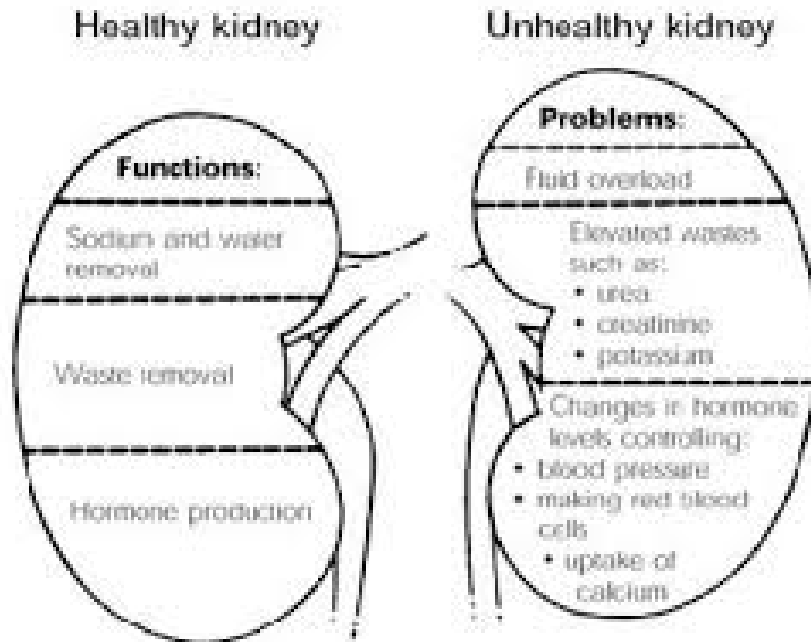


# Renal Disease

Presented by UIC College of Nursing

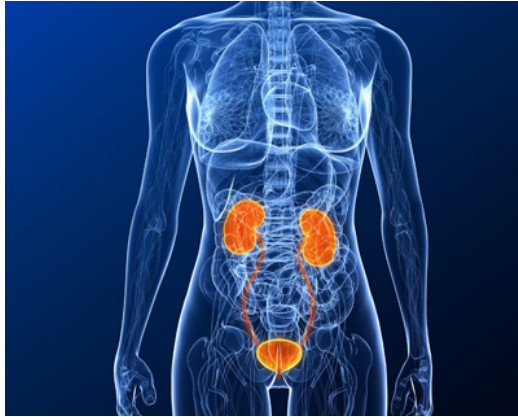


# Renal Disease



- Purpose and Objectives
- Background
- Renal disease
  - Causes
  - Statistics
- Renal disease and Hypertension
- Renal disease and Diabetes
- Types
  - Acute renal failure
  - Chronic kidney disease
  - End stage renal disease
- Dialysis
- Pre- and Post-Transition
- Resources
- References

# Purpose and Objectives



## ■ PURPOSE:

- Develop an understanding of renal disease and the impact of chronic health conditions on the kidneys.
- Improve skills for assisting a participant with renal disease.

## ■ OBJECTIVES:

- Identify the impact of chronic illness on the kidneys.
- Differentiate between different stages of renal disease.
- Identify areas that the TC needs to assess and plan for both *before and after* transition in the participant with kidney disease.
- Identify red flags for the participant with end stage renal disease.

# Background

- Semantics:

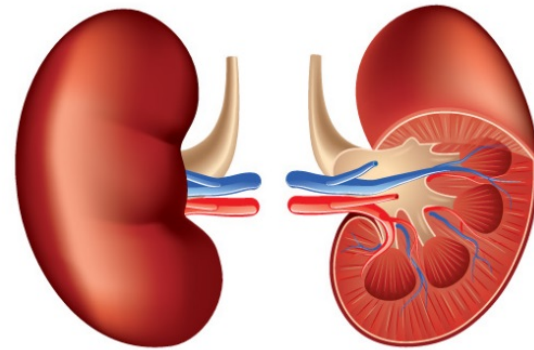
- Renal vs Kidney

- Synonymous; just be aware

- Definition of Renal

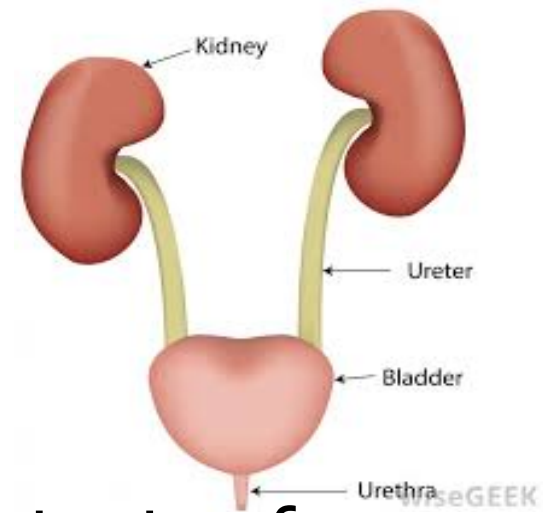
Renal: Having to do with the kidney. From the Latin *renes* (the kidneys).

- Google images: same for renal and kidney



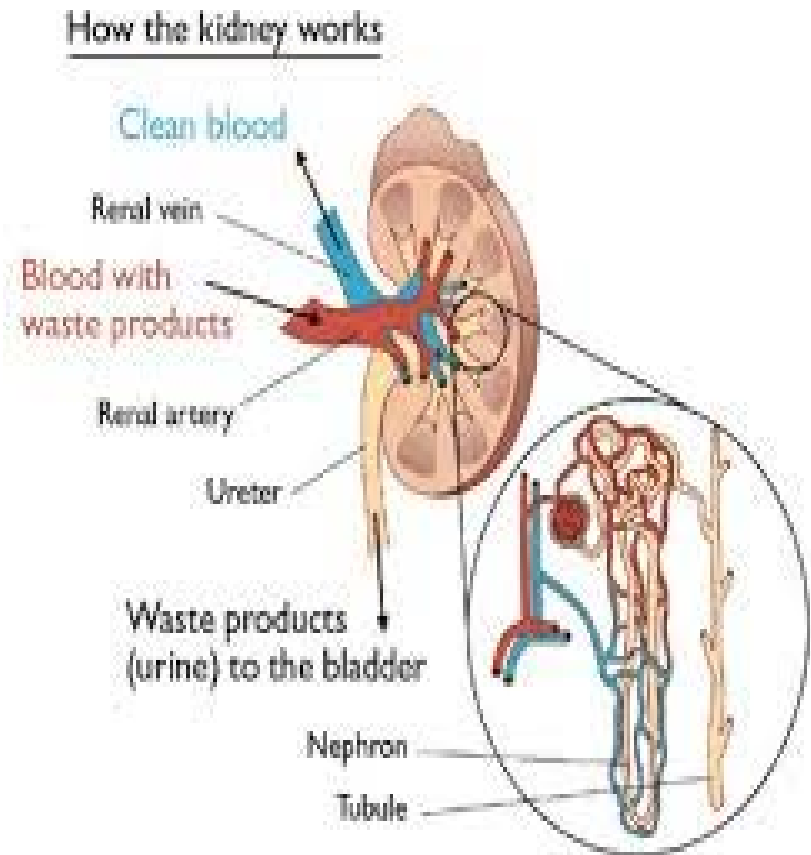
# What do the kidneys do?

- Main purpose: separate urea, mineral salts, toxins and other waste products from the blood.
- Conserve water and electrolytes (potassium, sodium, chloride, carbon dioxide/bicarbonate).
- At least one kidney must be functioning for life to be supported.

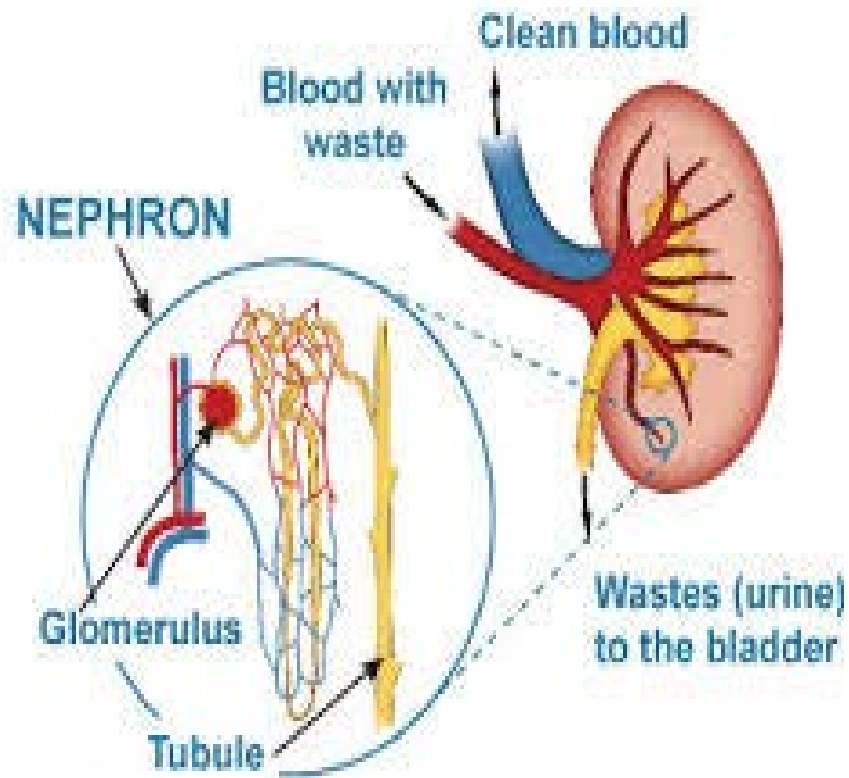


# What do the kidneys do?

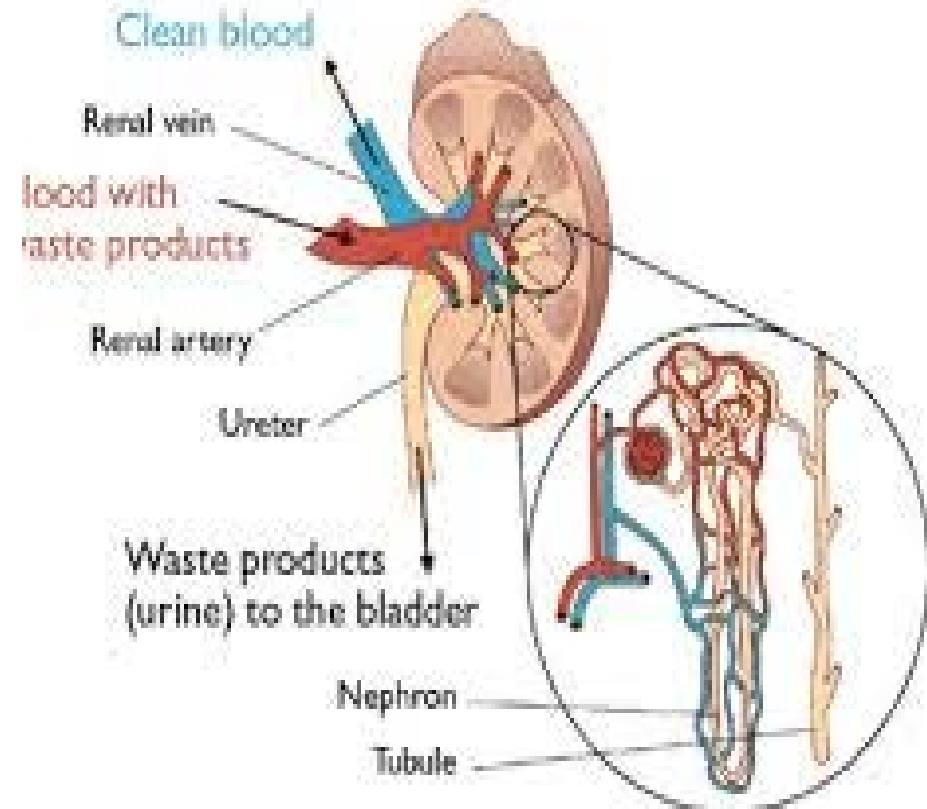
- Clean the blood, filter waste.
- Conserve water and electrolytes
- Produce 2 main hormones:
  - Erythropoietin (*EPO*): bone marrow and red blood cells
  - Vitamin D: Calcium, bones.
- Secrete prostaglandins: renin-angiotensin-aldosterone hormonal system to regulate blood pressure.
- Respond to other hormones: cortisol, parathyroid hormone and calcitonin.



# How do they do it?



## How the kidney works



# Renal Disease

- So what could possibly go wrong???





# Renal Disease

- What is renal disease:

When your kidneys are damaged, waste products and fluid can build up in your body:

- RED FLAGS//Symptoms:

- \*swelling
- \*vomiting
- \*weakness
- \*tremor
- \*confusion
- \*dizzy
- \*lethargy
- \*fever
- \*shortness of breath
- \*High/low BP

- Without treatment, the damage can get worse, and your kidneys may eventually stop working. That's serious, and it can be life-threatening.



# Renal Disease

## ACUTE RENAL DISEASE

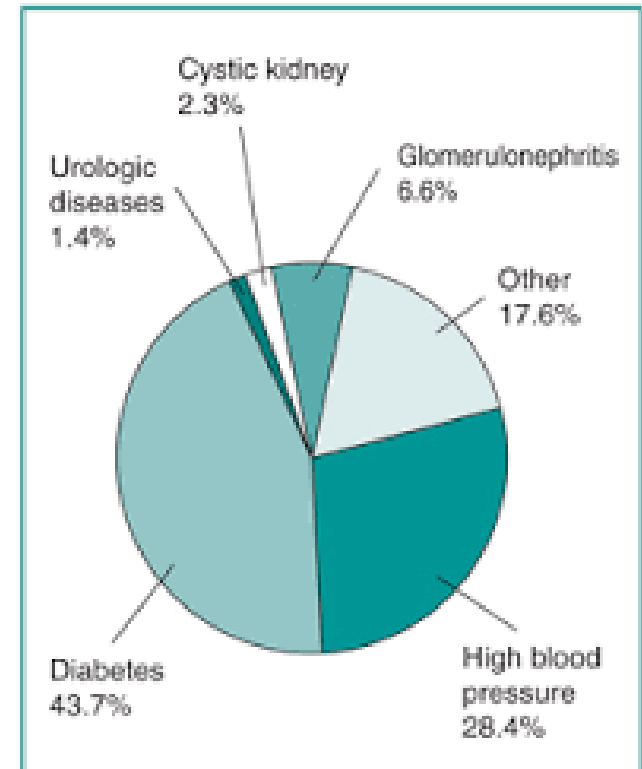
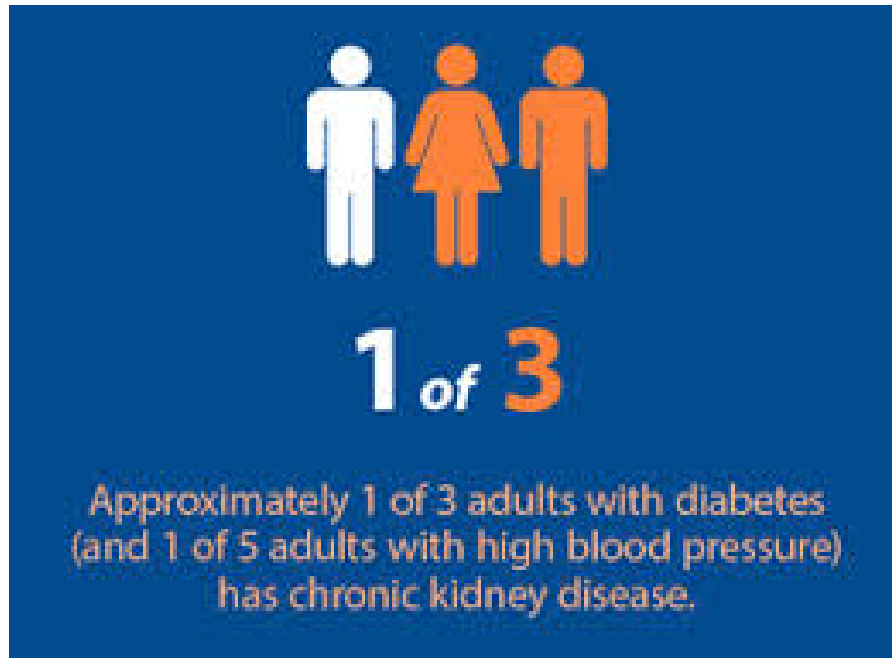
- Fast onset.
- Contributing factors:
  - Decreased blood flow
  - Direct damage to the kidneys themselves
  - Urine backed up/obstruction

## CHRONIC RENAL DISEASE

- Slower onset; >3months.
- Most common causes:
  - Diabetes
  - Hypertension
  - Autoimmune diseases
  - Long-lasting viruses
  - Pyelonephritis
  - Polycystic kidney disease
  - Medications
  - Illicit drugs
  - Chemicals

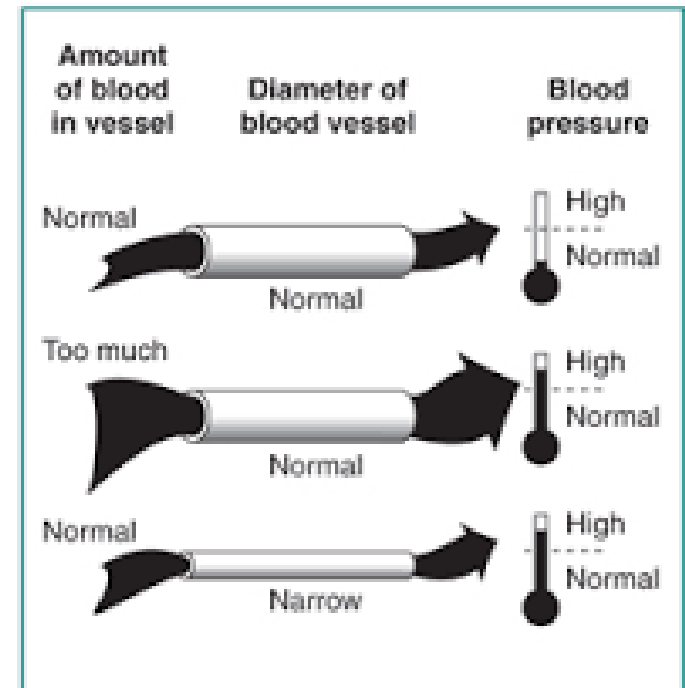
# Renal Disease

- Statistics



# Renal Disease

- Impact of high blood pressure:
  - Over time, hypertension harms renal blood vessels.
  - Damaged kidney arteries to not filter blood as well.
  - Damaged kidneys fail to regulate blood pressure.



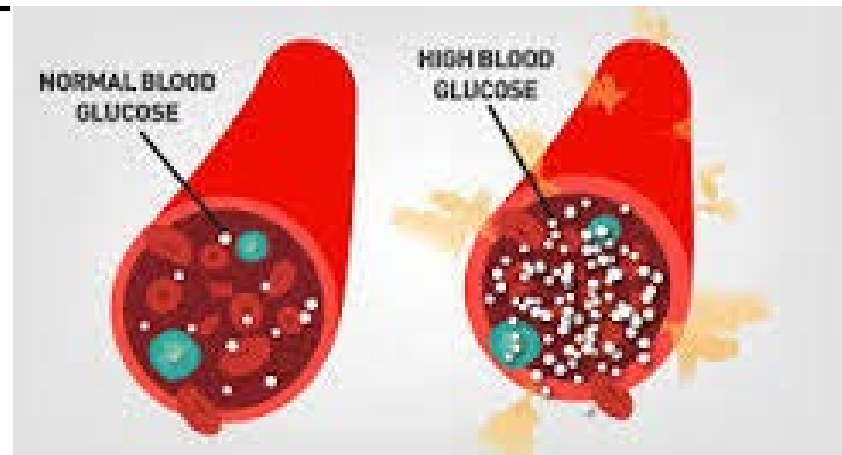
# Renal Disease

- Impact of diabetes:

- High glucose/sugar  
Increases work load  
of the kidneys.

- Protein increases in urine.

- If not stopped-Renal failure



# Renal Disease

- Catch your breath....
- We've covered what the kidneys do,
- How they do it,
- Renal disease: acute, chronic
- Statistics
- Impact of HTN and Diabetes.....



# Types of Renal disease

Acute Renal Failure (ARF)	Sudden loss of function: illness, injury, toxin
Chronic Kidney Disease (CKD)	Long process decreasing kidney function
End-Stage Renal Disease (ESRD)	Permanent shut-down of kidneys

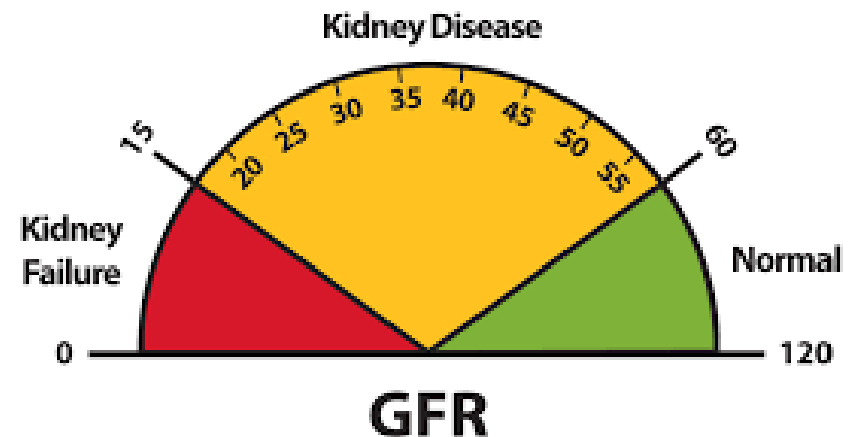
# Renal Disease

- Glomerular filtration rate (GFR):

Chronic Kidney Disease Stages

Stage	Description	GFR (mL/min/1.73m <sup>2</sup> )
1	Kidney damage* with normal GFR	>90
2	Kidney damage with mild ↓ GFR	60-89
3	Moderate ↓ GFR	30-59
4	Severe ↓ GFR	15-29
5	Kidney Failure	<15 (or dialysis)

\*Kidney damage = abnormal urine analysis or abnormal imaging of the kidneys.  
Adapted from Am J Kidney Dis 2000; 36 (2 Suppl 1): S46-S75.





# Renal Disease

The Five Stages of Chronic Kidney Disease

Stage	Description	Glomerular Filtration Rate (GFR)	Kidney Function Deterioration*
1	Kidney damage (protein in urine) and normal GFR	More than 90	50% - 60%
2	Kidney damage and mild decrease in GFR	60 - 89	60% - 70%
3	Moderate decrease in GFR	30 - 59	70% - 77.5%
4	Severe decrease in GFR	15 - 29	77.5% - 85%
5	Kidney failure—End Stage Renal Disease (dialysis or kidney transplant needed)	Less than 15	85% and above

# Renal Disease

- **Stage 1:**
- Kidney damage with normal or high GFR
- GFR: 90 or above
- **What does this mean:**
- Your doctor will try to find the cause of your kidney disease and begin treatment.
- Manage other health problems, such as diabetes and high blood pressure.
- See your doctor regularly to monitor your condition.

# Renal Disease

- **Stage 2:**
- Kidney damage with mildly low GFR
- GFR: 60 - 89
- **What does this mean:**
- Your doctor will estimate how quickly your disease is progressing.
- Manage other health problems, such as diabetes and high blood pressure.
- Continue regular monitoring.

# Renal Disease

- Stage 3:
  - Kidney damage with moderately low GFR
  - GFR: 30 - 59
- What does this mean:
  - Your doctor will check you for complications, such as anemia and bone disease, and begin treatment if needed.

# Renal Disease

- **Stage 4:**
- Kidney damage with severely low GFR
- GFR: 15 - 29
- **What does this mean:**
- Decide what type of treatment you want if kidney failure develops.
- Continue treatment and monitoring.

# Renal Disease

- Stage 5:
- Kidney failure
- GFR: < 15
- What does this mean:
- Start dialysis, have a kidney transplant, or choose palliative care.
- Continue to see your doctor for treatment and testing.

# Renal Disease

- Other blood tests affected by renal failure:
- Blood urea nitrogen (BUN):
  - Breakdown of protein->Urea Nitrogen in the blood.
  - A high **BUN** usually means that kidney function is less than **normal**, but other factors may affect the **BUN level**. ... The **normal BUN level** for healthy individuals is 7-20 mg/dL in adults, and 5-18 mg/dL in children. Patients on dialysis have higher **BUN levels**, usually 40-60 mg/dL.

# Renal Disease

- Other blood tests affected by renal failure:
- Creatinine is a waste product that is produced continuously during normal muscle breakdown. The kidneys filter creatinine from the blood into the urine, and reabsorb almost none of it.
- **Normal levels of creatinine** in the blood are approximately 0.6 to 1.2 milligrams (mg) per deciliter (dL) in adult males and 0.5 to 1.1 milligrams per deciliter in adult females.



# Renal Disease

- Key test results to follow:
- GFR
- BUN
- Creatinine

# Renal Disease

## Management of Renal Disease or Failure

Acute Renal Failure (ARF)	Sudden loss of function: illness, injury, toxin
Chronic Kidney Disease (CKD)	Long process decreasing kidney function
End-Stage Renal Disease (ESRD)	Permanent shut-down of kidneys

# Renal Disease

- Management of Acute renal failure:
  - Identify and reverse the cause
  - IV fluids
  - Control blood pressure
  - Control blood sugar
  - Dialysis- time limited

# Renal Disease

- Management of Chronic kidney disease:
  - Control hypertension
    - Medications, diet
  - Control diabetes
    - Medications, diet
  - Routine surveillance of kidney blood tests
    - GFR, BUN, Creatinine, electrolytes, blood sugar

# Renal Disease

- Management of End-stage renal disease (ESRD):
  - Control blood pressure, diabetes.
  - Medications: blood pressure, diabetes, diuretics, electrolytes, treatment for anemia.
  - Home blood pressure monitor
  - Blood sugar testing supplies
  - Scale
  - Log to record results

# Renal Disease

- Management of End-stage renal disease (ESRD):
  - Nutrition:
    - Need to consult with the nutritionist.
    - Generally: **Dialysis** changes dietary needs. Patients undergoing typical hemodialysis, involving about three treatments per week, follow diets that are restricted in **protein**, sodium, potassium, phosphorus, and fluid. ...  
Sodium: Sodium intake must be modified to prevent hypertension, congestive heart **failure**, and pulmonary edema.

# Renal Disease

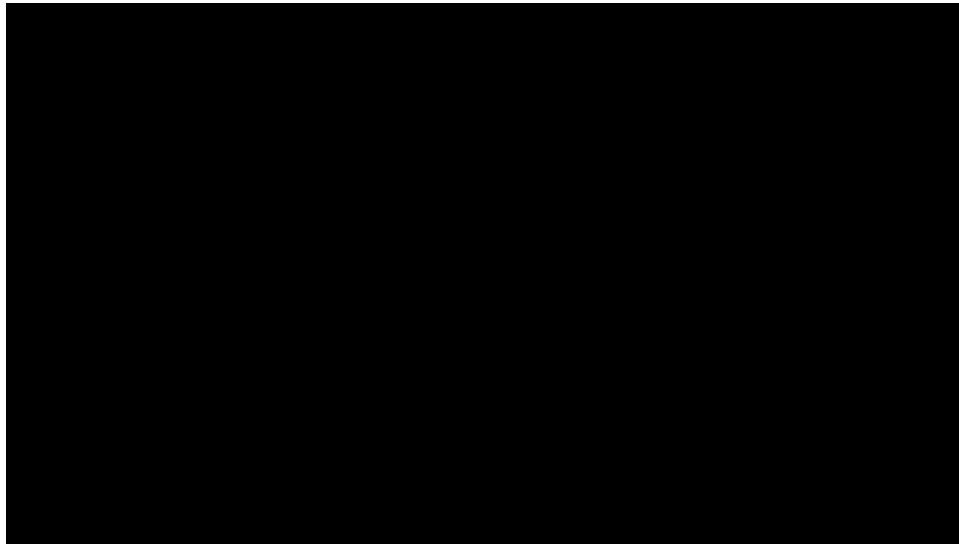
- Management of End-stage renal disease (ESRD):
  - Nutrition: 15 super-foods

Red bell peppers	Cabbage	Cauliflower
Garlic	Onions	Apples
Cranberries	Blueberries	Raspberries
Strawberries	Cherries	Red grapes
Egg whites	Fish	Olive oil

- <https://www.davita.com/kidney-disease/diet-and-nutrition/lifestyle/top-15-healthy-foods-for-people-with-kidney-disease/e/5347>

# DaVita: Renal Diet

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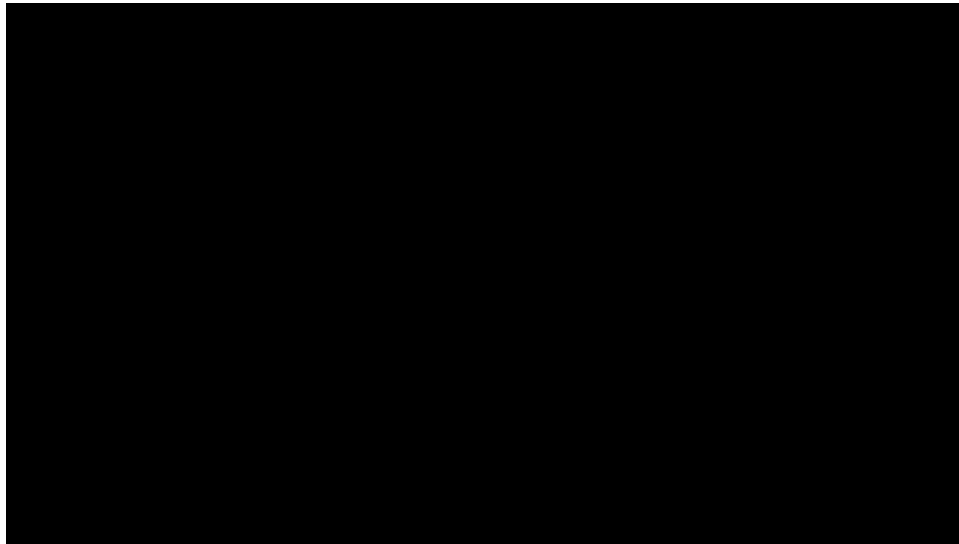


# Renal Disease

- Management of End-stage renal disease (ESRD):
  - Kidney transplant.
  - **Dialysis.**

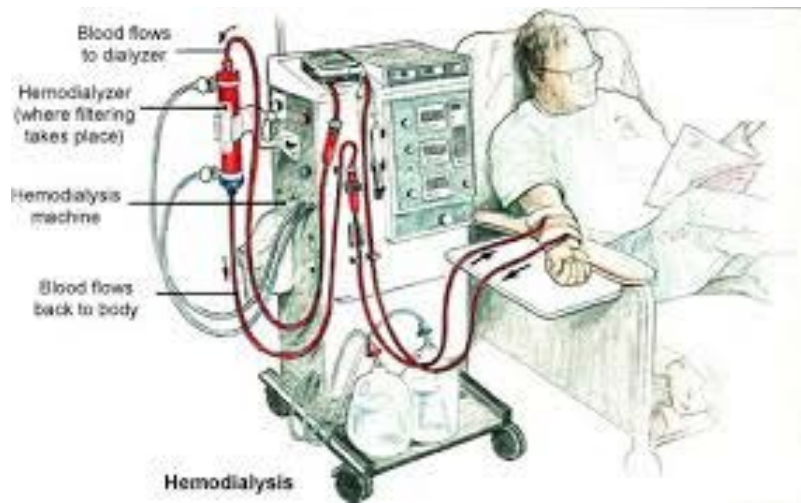
# Dialysis: DaVita video

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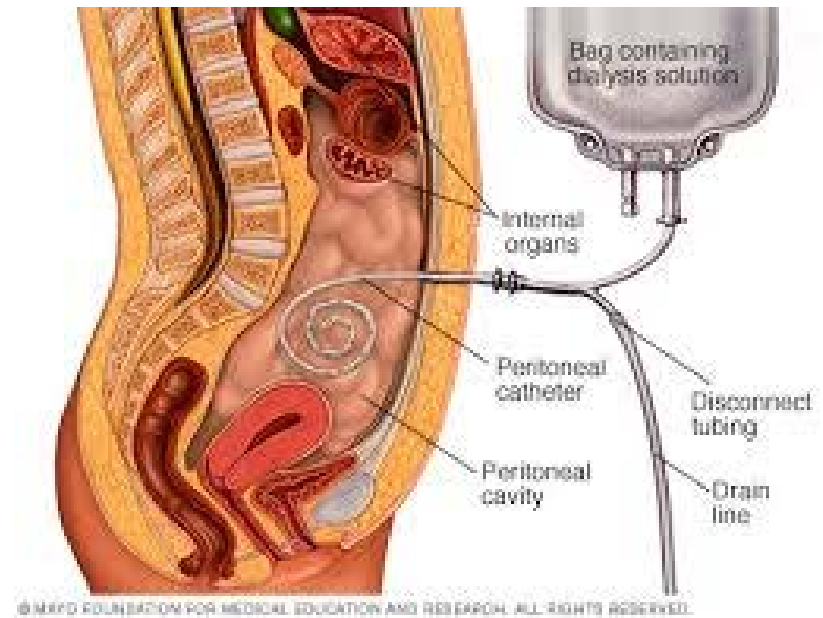


# Renal Disease

- Hemodialysis:

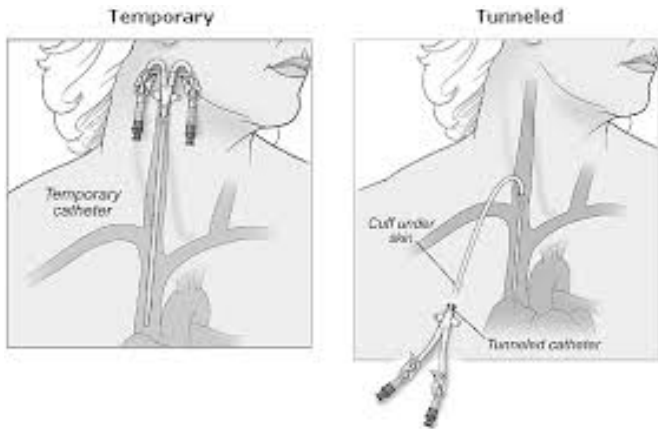


- Peritoneal Dialysis:

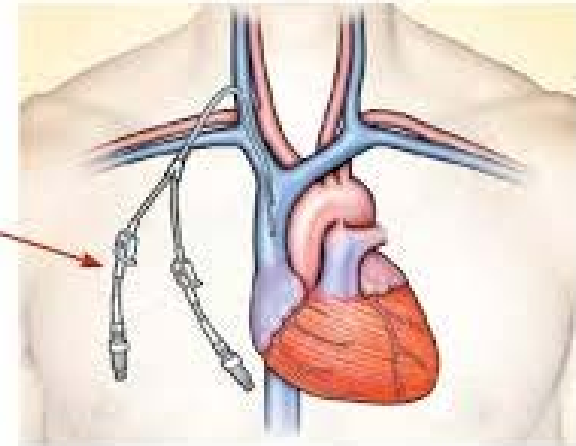


# Renal Disease

- Dialysis catheter:

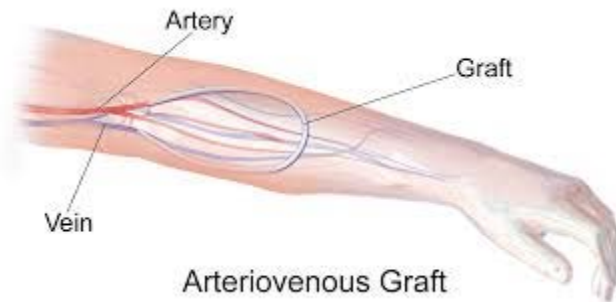


Catheter Tubes

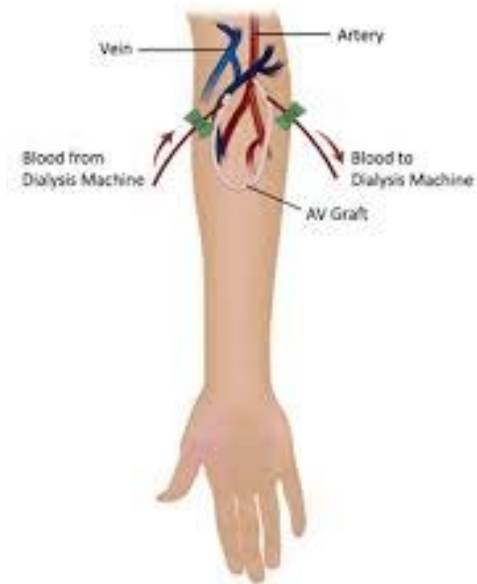


# Renal Disease

- Arteriovenous (AV) Graft: (tube connection)



AV Graft For Dialysis

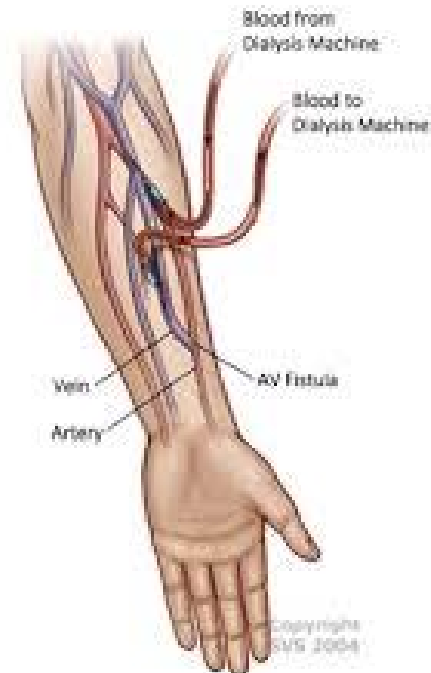


# Renal Disease

- Arteriovenous (AV) fistula: Direct connection (Gold standard)



## AV Fistula For Dialysis



# Renal Disease

- Care for dialysis catheter:
- Keep the catheter dressing clean and **dry**.
- Never remove the cap on the end of your catheter. Air **must not** enter the catheter.
- You must not wet your catheter site or catheter dressing.
- Wear a mask over your nose and mouth anytime the catheter is opened
- The **caps** and the **clamps** of your catheter should be kept **tightly closed** when not being used for dialysis.
- If the area around your catheter feels sore or looks red, call your dialysis care team at once. Ask your dialysis team about signs and symptoms that require immediate attention.

# Renal Disease

- Dialysis catheter complications:
  - Clots
  - Infection



# Renal Disease

- Care for AV Fistula:
  - Arm strengthening prior to use.
  - Monitor for signs of infection.
  - Keep site clean/dry.
  - Allow for proper blood flow.
  - Check for blood flow: bruit, thrill.

# Renal Disease

- Need to know about hemodialysis:  
<https://www.kidney.org/sites/default/files/docs/hemodialysis.pdf>



National Kidney  
Foundation™

Hemodialysis:  
What You Need to Know

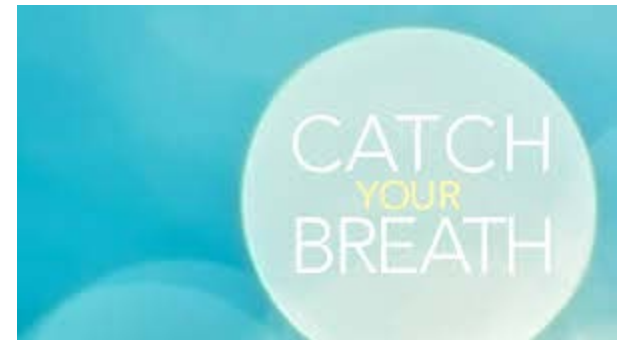


# Renal Disease

- Need to know about dialysis:
  - Scheduled appointments: plan ahead
  - Generally 3x/week
  - Lasts 3-4 hours
  - Fatigue, exhaustion after
  - Medications before/after
  - Cannot skip
  - Talk with the team; take notes

# Renal Disease

- Catch your breath....
- We've covered renal blood tests,
- Stages, chronic-> end stage
- Management,
- Hemodialysis and Peritoneal dialysis,
- Dialysis catheter care.....



# Renal Disease

- Assessment prior to transition:
  - Know/understand the diagnosis (literacy)
  - Education/training of the participant
  - Identifies all providers: primary care, specialists such as kidney doctor (nephrologist), diabetes doctor (endocrinologist), heart doctor (cardiologist), surgeon.
    - Name/contact info/ follow-up and frequency/ transportation and back-up transportation

# Renal Disease

- Assessment prior to transition:
  - Knowledge of proper nutrition
  - Baseline results
    - Blood tests: Kidneys, diabetes (Hemoglobin A<sub>1c</sub>)  
HgBA<sub>1C</sub>
    - Blood sugars
    - Blood pressure
    - Weight
  - Support: current; referrals

# Renal Disease

- Assessment after transition:
  - Discuss f/u with physician specialists; outcome.
  - Review self-management at home:
    - BP, blood sugars, weight, food/fluid intake, logs
  - Blood tests
  - Monitor for red flags
  - Support/coping

# Renal Disease

- DaVita Dialysis video:
- <https://www.youtube.com/watch?v=CGwJGkCczKU>





# References

- <http://www.webmd.com/a-to-z-guides/understanding-kidney-disease-basic-information#1>
- <http://www.diabetes.org/living-with-diabetes/complications/kidney-disease-nephropathy.html?referrer=https://www.google.com/>
- <http://www.webmd.com/a-to-z-guides/tc/stages-of-chronic-kidney-disease-topic-overview>
- <https://www.davita.com/kidney-disease/diet-and-nutrition/lifestyle/top-15-healthy-foods-for-people-with-kidney-disease/e/5347>
- <https://www.niddk.nih.gov/health-information/health-communication-programs/nkdep/learn/causes-kidney-disease/kidney-disease-basics/Pages/kidney-disease-basics.aspx>

# Resources

- The American Diabetes Association
  - <http://www.diabetes.org>
- The Kidney Foundation:
  - <https://www.kidney.org/>
- Mayo Clinic:
  - <http://www.mayoclinic.org/search/search-results?q=renal%20disease>
- National Institute of Diabetes and Digestive and Kidney Disease
  - <https://www.niddk.nih.gov/health-information/health-communication-programs/nkdep/learn/causes-kidney-disease/kidney-disease-basics/Pages/kidney-disease-basics.aspx>
- WebMD
  - <http://www.webmd.com/a-to-z-guides/understanding-kidney-disease-basic-information#1>

# Renal Disease

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