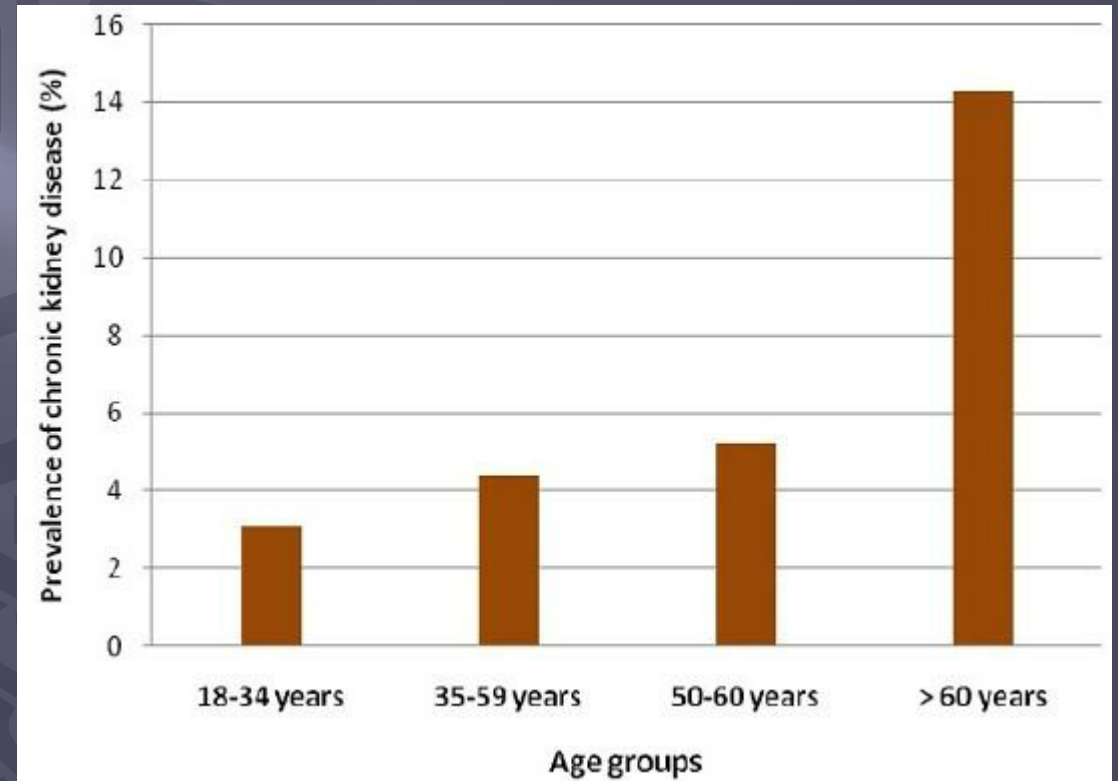


# AGING AND THE MOST COMMON KIDNEY DISEASES ASSOCIATED WITH THE ELDERLY

Prevalence of chronic kidney disease by age group with a focus on 65+.

Renal failure usually follows stages of kidney disease.



# Interesting Facts around Kidney Disease

Kidney disease kills more people per year than breast cancer and prostate cancer.

National Kidney Foundation recommends an annual kidney disease screening after 60.

Risk factors for kidney disease include: HTN, DM, renal stones, a history of chronic kidney disease, prolonged use of over the counter pain medications, and simply being over 60.

More than 37 million Americans, or 1 in 7 adults, have CKD and don't even know it.

There are over 120,000 Americans on the national transplant waitlist, and more than 98,000 await a life saving kidney transplant

# Dehydration plays a big part in kidney disease in the aging population (Touhy/Jet)

- ▣ **Dehydration** is considered a geriatric “syndrome” that is commonly associated with many common diseases and frailty.
- ▣ **Dehydration** is often an underappreciated comorbid condition that exacerbates an underlying condition such as UTI, respiratory tract infections, or worsening mental health s/s.
- ▣ **Dehydration** is a significant risk factor for many other conditions and illnesses, for example kidney stones, thromboembolism, and medication toxicity.
- ▣ **\*Dehydration** is such a problem in the aging population in all settings, that if not treated quickly can lead to increased mortality/death

# Pathogenesis and its relationship to the body

- ▣ There are few diagnoses that generate as much concern about causes and consequences to the human body as does dehydration.
- ▣ There is a lack of understanding of the pathogenesis and the consequences of dehydration in the elderly population, which leads clinicians to sometimes come to the wrong conclusions in regards to what dehydration might be attributed to.

The condition is rarely due to neglect, especially in a skilled setting and acute setting. The majority of older people develop dehydration as a result of increased fluid losses combined with decreased fluid intake, related to decreased thirst. Rarely is due to neglect. (Touhy/Jett)

# Two of the most common kidney illnesses experienced by the older age population: also most impactful

## ▣ Urinary Tract Infection

- ▣ s/s: persistent urge. Painful urination, small amounts of urine at a time, urine is cloudy, urine may also look pink or red (sign of blood in the urine), and foul odor, or malodor.
- ▣ Mechanism: bacterial infection in the upper or lower urinary tract.
- ▣ Poor hydration, acute tubular necrosis, bacteria, acute kidney stones, poor perfusion.

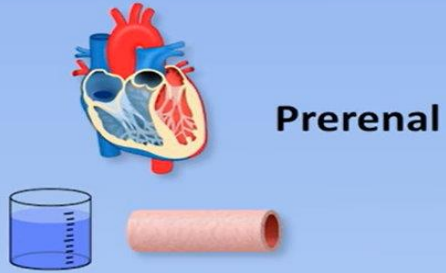
## ▣ Acute Kidney Injury

- ▣ s/s: Nausea/vomiting, fatigue,
- ▣ Dizziness or weakness, trouble with concentration, and possible edema in the extremities.
- ▣ Mechanism: Severe drop in BP, shock d/t poor organ perfusion related to acute illness or damage to kidneys from drugs, toxins, for example, any obstruction from kidney stones, or an enlarged prostate, or other tumors.



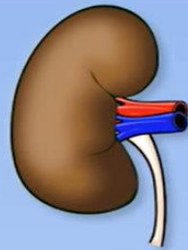
# Acute Kidney Injury(insufficiency)

## Acute Kidney Injury (AKI) Prerenal vs. Intrarenal vs. Postrenal Paradigm



Prerenal

- **Dehydration\***
- **Heart failure**  
(a.k.a. cardiorenal syndrome)
- **Liver failure**  
(a.k.a. hepatorenal syndrome)



Intrarenal

- **Intrinsic renovascular disease**
  - Hypertensive emergency
  - Small vessel vasculitis
  - TTP / HUS
- **Glomerular disease**
  - Post-infectious glomerulonephritis
- **Tubulointerstitial disease**
  - Acute tubular necrosis (ATN)\*  
(causes: sepsis, meds, contrast, rhabdo, prolonged prerenal AKI)
  - Acute interstitial nephritis (AIN)



Postrenal

- **Ureteral obstruction**  
(usually requires bilateral obstruction)
- **Neurogenic bladder**
- **Urinary tract infection**
- **Medications**
- **Benign prostatic hypertrophy (BPH)**

# S/S of Acute Kidney Injury

## ACUTE KIDNEY INJURY (AKI)

- SIGNS & SYMPTOMS -

### Oliguric Phase

- Oliguria - <400mL/day; occurs within 1-7 days of kidney injury
- Urinalysis – casts, RBCs, WBCs, sp gr fixated at 1.010
- Metabolic Acidosis
- Hyperkalemia and Hyponatremia
- Elevated BUN and Creatinine
- Fatigue & Malaise

### Diuretic Phase

- Gradual ↑ in urine output - 1-3 L/day; may reach 3-5 L/day
- Hypovolemia, Dehydration
- Hypotension
- BUN and Creatinine Levels Begin to Normalize

### Recovery Phase

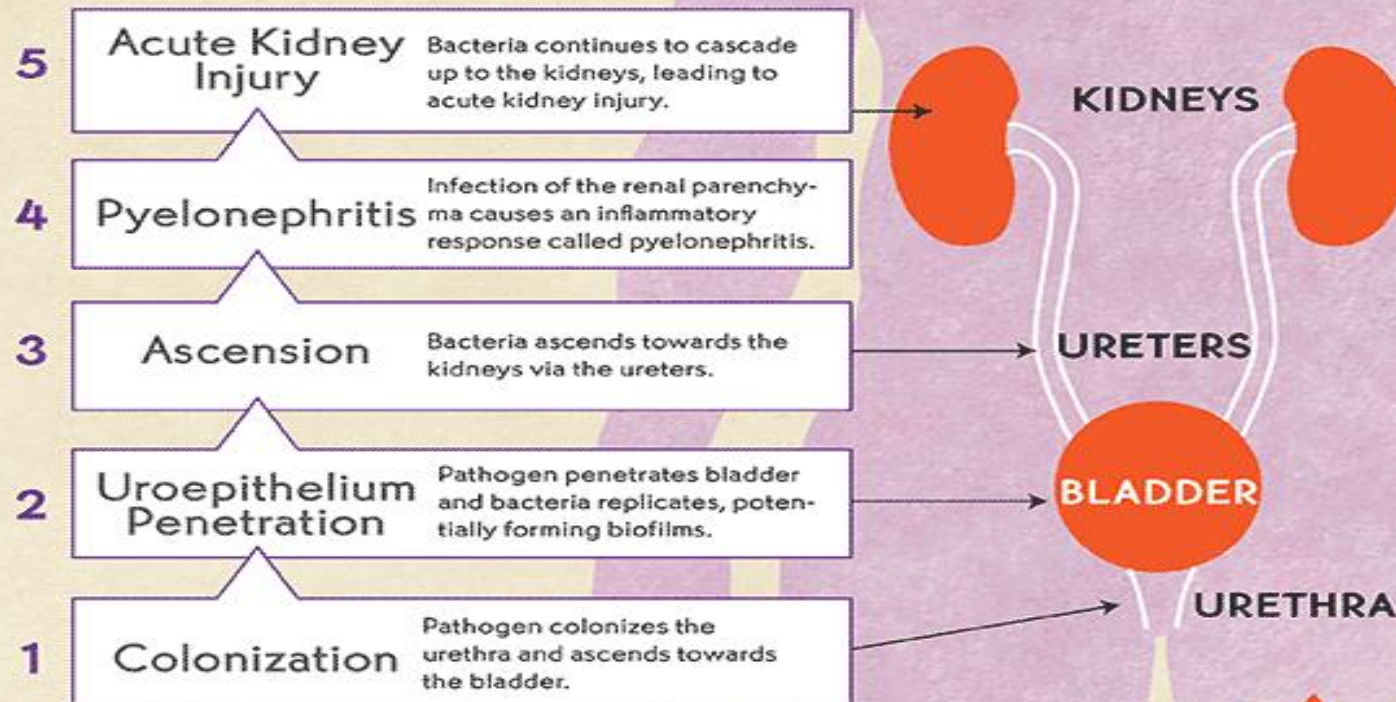
- Begins when GFR Increases
- BUN and Creatinine Levels Plateau, then ↓





# Urinary Tract Infection

## Stages of a Urinary Tract Infection





# URINARY TRACT INFECTIONS IN THE ELDERLY ARE COMMON IN BOTH GENDERS



The effects of aging make urinary tract infections in the elderly hard to detect and hard to cure. Senior's immune systems are usually weak and can't fight rapidly multiplying bacteria.



People who are young and healthy have the edge over the elderly because their immune systems are typically healthy and active.



When the elderly can't communicate their discomfort, a urinary tract infection in seniors can cause serious health problems—in men and in women.

## HOW DOES A URINARY TRACT INFECTION IN SENIORS START?



UTI symptoms in the elderly begin when bacteria enters the urinary tract.



Many elderly people have weakened bladder muscles, causing incontinence, which can lead to bacteria in the urinary tract.

Bladder prolapse, which is a condition where the bladder drops down, makes it difficult for a senior's body to empty the bladder completely. The remaining urine left inside the bladder makes conditions right for bacteria to multiply.

### Bladder prolapse



UTI symptoms in the elderly often start immediately after a hospitalization if a senior needed to have a catheter inserted during the hospital stay. Hospitals do their best to keep people and equipment sanitary, but hospitals have germs hiding everywhere from other patients. Any time an object gets inserted into the body there is risk of infection.

Bacteria called enterococci or staphylococci are usually the culprits that cause a urinary tract infection in seniors. These types of bacteria multiply quickly. As people age, their immune systems don't work as effectively as they did when they were young. As a result, the elderly's immune systems can't keep up with fighting the infection.



A urinary tract infection in seniors doesn't discriminate between men and women.



Many other medical conditions can cause a urinary tract infection in seniors like diabetes, immobility, poor hygiene, complications from medicines, and problems emptying the bladder completely.

# What are the possible results ?

- ▣ Infection
- ▣ Shock (sepsis)
- ▣ Acute tubular necrosis
- ▣ Damage to one or both sides of the kidney
- ▣ The impacts of UTI and AKI are more severe in the elderly
- ▣ Recovery is hampered by the kidney's reduced ability to restore homeostasis in the aged population
- ▣ Spotting the impacts of dehydration are not as easy in the older adult population
- ▣ Worst case scenario is Dialysis or even kidney transplant

# UTI's

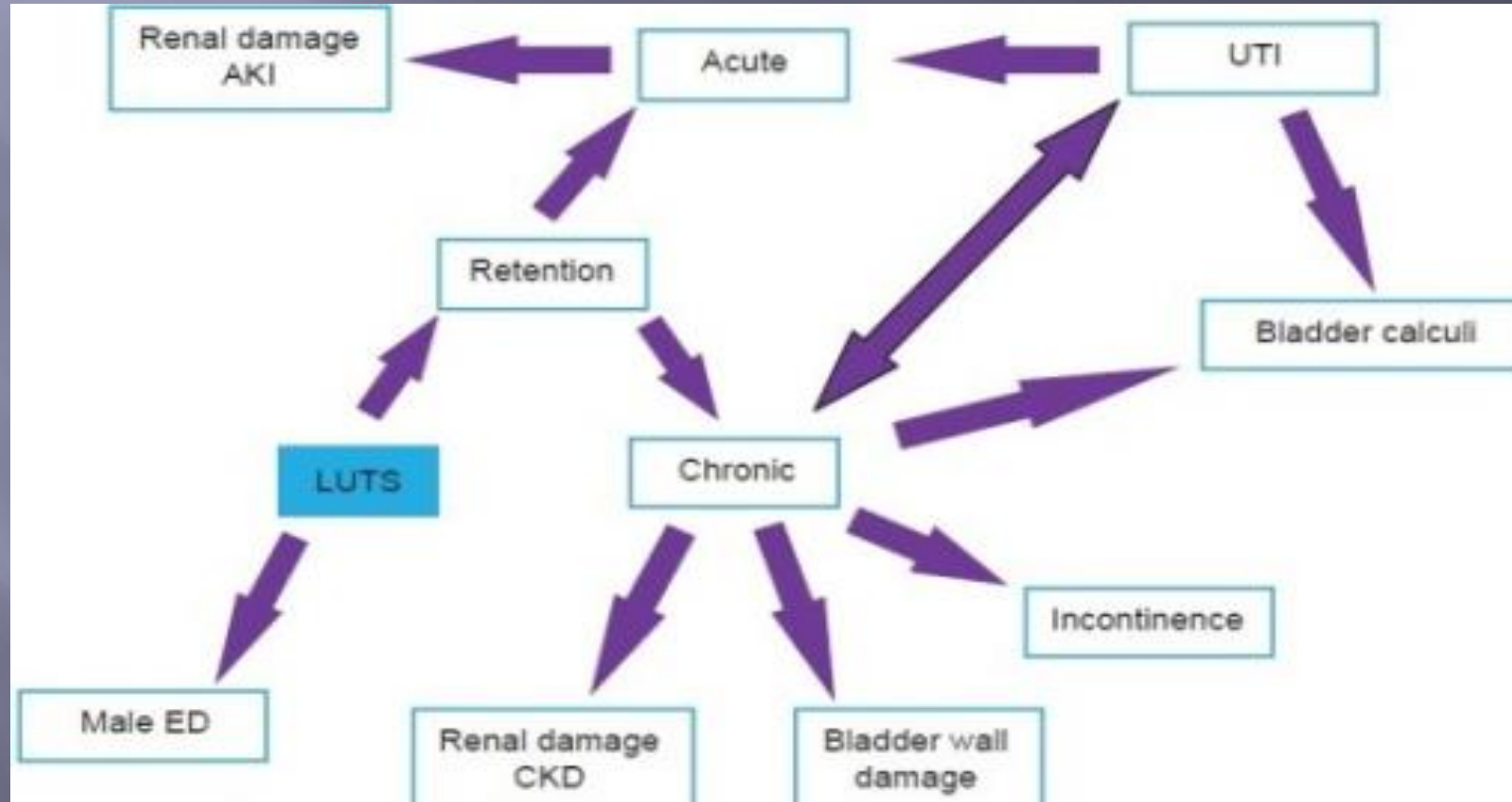
- ❑ Urinary Tract infections can be encouraged by damage or abnormalities in the urinary tract itself.
- ❑ Persons with frequent indwelling catheters also are at risk for urinary tract infections.
- ❑ Sometimes untreated or undertreated urinary infections and irritations can result in chronic infections and further kidney damage and even sepsis.
- ❑ Common reasons for recurring infection have to do with individuals not finishing their prescribed medications. This is more common than you think and can lead to greater resistance to antibiotics.

# AKI A complex condition

- ▣ Though this condition follows a basic three stage progression AKI is a complex condition.
- ▣ Infection and AKI can be connected
- ▣ Dehydration
- ▣ Anytime fluid volume is diverted for any length of time can lead to AKI
- ▣ Some medications with toxic affects can cause AKI (NSAIDS and ASA)
- ▣ Age, DM, HTN, blood clots (clotting abnormalities) and hemorrhage can also contribute to AKI



# Common relationship of UTI and AKI



# Treating UTI and mild AKI

- ▣ Treat what is causing the acute AKI. Antibiotics, fluids, Renal function panel and urinalysis, are typically used to treat AKI.
- ▣ Treatment of AKI usually requires a short hospital stay, but can be longer depending on severity. Important to restore electrolyte balance, especially Na and Potassium. Calcium infusions may be necessary to restore proper calcium levels in the blood stream.
- ▣ Dialysis may be involved, in the short run. Depends on the severity of injury and ability of kidney function to resume under normal conditions.
- ▣ In stay might include telemetry to monitor for changes in heart rhythm.

# Treating UTI and mild AKI

- ▣ In the case of UTI the treatment is geared toward eliminating infection and the possibility of involving more of the urinary system.
- ▣ Preventing sepsis is also very important.
- ▣ Treatment is geared toward eliminating the cause of infection. Amoxicillin and Macrobid are usually prescribed orally if infection case is mild.
- ▣ Hospital stays with infection may include IV antibiotics of a stronger type. UTI's and kidney infections can cause a host of other s/s, too.
- ▣ Fluid restoration and balance.
- ▣ Fever and pain reduction with Tylenol and with Pyridium are useful.

# Prevention of UTI and AKI

- ▣ UTI
  - ▣ Manage chronic illness
  - ▣ Stay hydrated
  - ▣ Keep notice of s/s of urinary changes, amount, color, and smell.
  - ▣ Notice any changes in temperature and mentation/confusion
  - ▣ Assessment by physician asap is very important.
- ▣ AKI
  - ▣ Serum Creatinine clearance is a standard tool in diagnosing.
  - ▣ GFR is another tool used to help diagnose.
  - ▣ Manage chronic illnesses that might have an impact on the kidneys.
  - ▣ Watch ingestion of medications known to be nephrotoxic



Questions???????



# Main references

- ▣ **Gerontological Nursing & Healthy Aging** , Ebersole and Hess, 5<sup>th</sup> Edition, 2018, Elsevier.
- ▣ **Pathophysiology Made Incredibly Easy**, 1998, Springhouse Publishers
- ▣ [https://www.kidney.org/news/monthly/wkd\\_aging](https://www.kidney.org/news/monthly/wkd_aging)