SMOKY URINE

DR ANJUM

LEARNING OBJECTIVES

- Definition
- Pathophysiology of renal infections
- Common symptoms associated with renal pathology
- Renal disease classification
- Treatment of chronic pyelonephritis

SMOKY URINE (CLOUDY URINE)

- **Normal urine**…. clear and has a **straw-yellow color,** the result of a pigment called **Urochrome** and how diluted or concentrated the urine is.
- When the urine does not have its characteristic clear appearance, it is often referred to as **cloudy, turbid, smoky or foamy urine.**

CAUSES

- **Dehydration**
- **Urinary Tract Infections,**
- **Bladder Stones,**
- **Glomerulonephritis,**
- **Blood.** **(Hematuria**) include urinary tract infections, an enlarged prostate, cancerous and noncancerous tumors, kidney cysts and kidney or bladder stones

CAUSES

- **Foods.** Beets, blackberries and rhubarb can turn urine red or pink.
- **Medications. Rifampin,** an antibiotic often used to treat tuberculosis, can turn urine reddish orange — as can phenazopyridine (**Pyridium**), a drug that numbs urinary tract discomfort, and laxatives containing senna

URINE ANALYSIS…. INDICATIONS

- Most **frequently used screening test**.
- Can be utilized, as monitoring the disease progression
- Suspected **urinary tract infections** (glomerulonephritis, Nephrotic syndrome, pyelonephritis or renal failure)
- Unexplained **acute** or **chronic renal failure**.

URINE ANALYSIS…. INDICATIONS

- **Hematuria or proteinuria** or both
- Suspected **urinary tract malignancy**
- Diagnosis of **pregnancy.**
- **Metabolic disorders…..DM**

Appearance

APPEARANCE	CAUSES
Clear	Normal
Cloudy	Leukocytes, bacteria, epithelial cells, amorphous phosphate (alkaline urine), amorphous urates (acidic urine)
White ppt	Amorphous phosphate
Amorphous pink ppt	Amorphous urate
Hazy	Mucus
Smoky	Microscopic hematuria
Milky	Fat, chyle

HEMATURIA

HEMATURIA ……the presence **of 5 or more red blood cells** (RBCs) per high-power field in 3 of **3 consecutive centrifuged specimens obtained at least 1 week apart**.

- **Hematuria** …..**Gross** (overtly bloody, smoky, or tea-colored urine) or **Microscopic**.

HEMATURIA

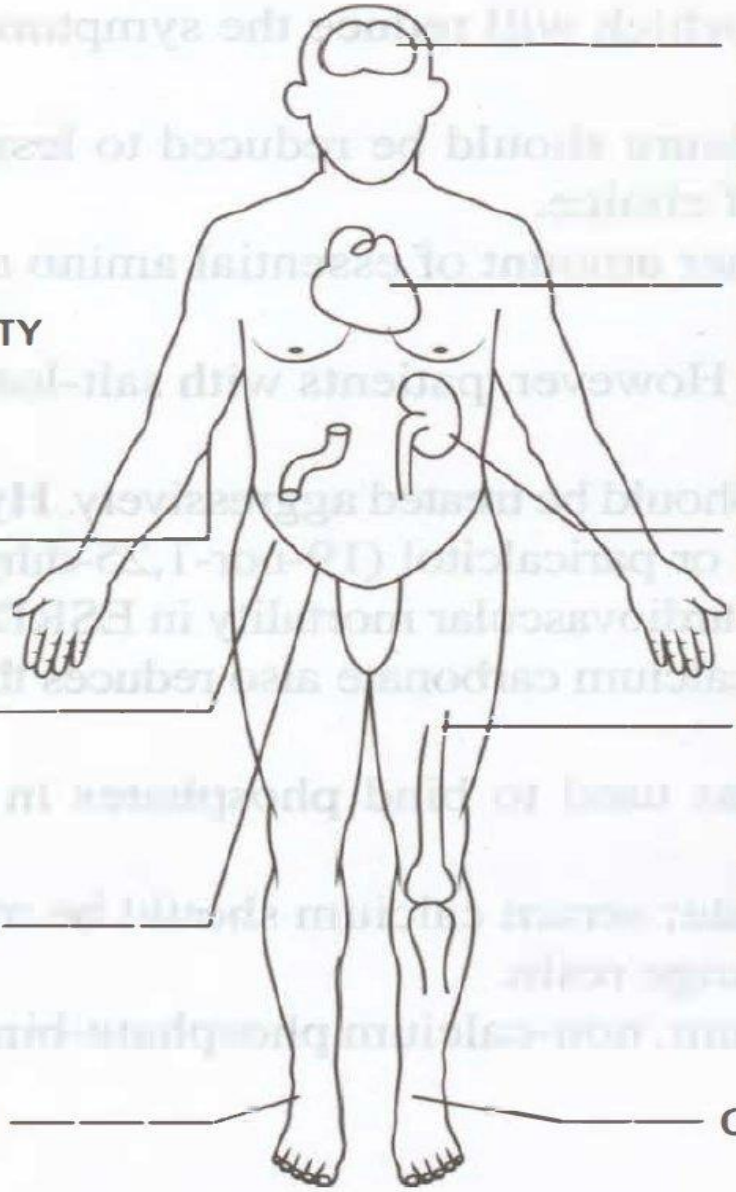
- Either **symptomatic or asymptomatic**
- Either **transient or persistent**
- Either **isolated** or **associated with proteinuria** and other urinary abnormalities.
- **Asymptomatic (isolated) Hematuria** generally does not require treatment.

COMMON KIDNEY SYMPTOMS

- Tiredness, less energy or are having trouble concentrating. ...
- Trouble sleeping. ...insomnia
- Dry and itchy skin. ...
- The need to urinate more often. ...
- Blood in your urine. ...
- Urine is foamy. ...
- Muscle twitches and cramps
- Difficulty in micturition , burning or less urine

COMMON KIDNEY SYMPTOMS

- Shortness of breath
- Anemia
- High blood pressure
- Food tastes like metal
- Ammonia breath
- Upset stomach , nausea and vomiting
- Experiencing persistent puffiness around your eyes and ankles



Signs and symptoms of CRF

Source : MEDICINE prep manual for undergraduate Mathew

CLASSIFICATION RENAL DISEASES

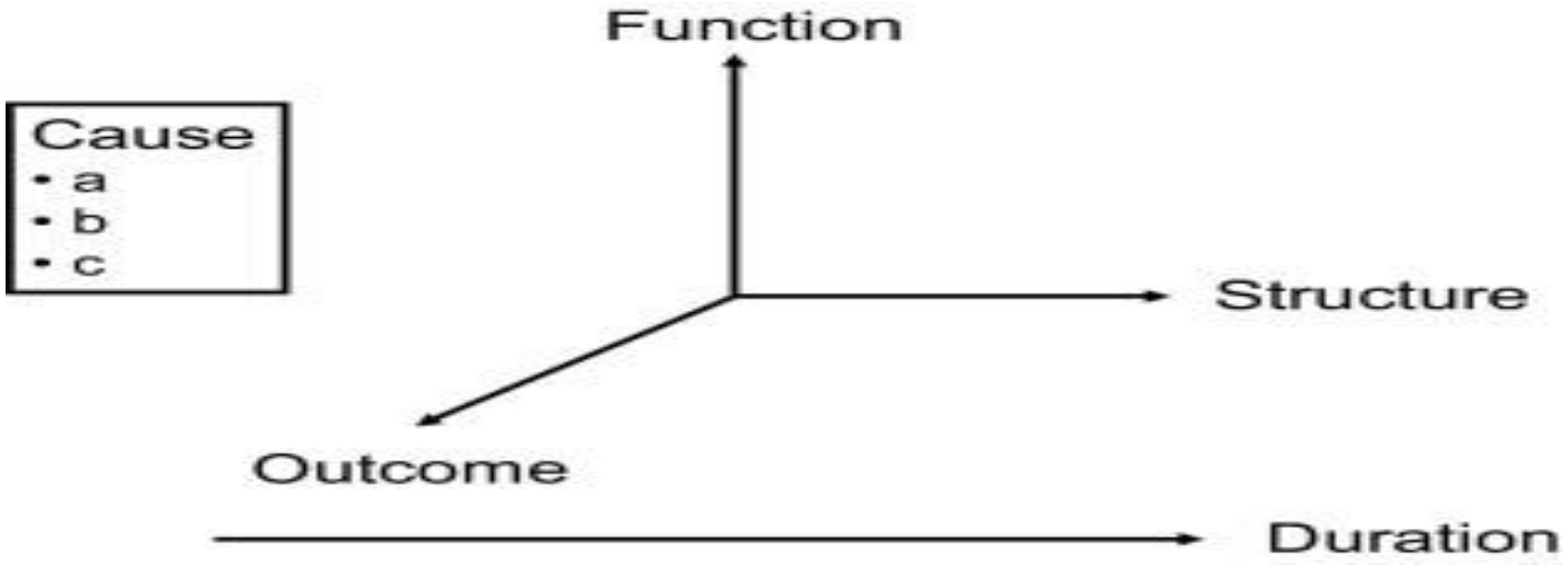
- **Kidney disease …..**heterogeneous group of disorders affecting kidney structure and function.
- It is recognized now that **even mild abnormalities** in kidney structure and function are associated with increased risk for developing complications in other organ systems as well as mortality, all of which occur far more frequently than kidney failure

CLASSIFICATION RENAL DISEASES

- Duration of greater than 3 months is defined as **CHRONIC**, while duration of 3 months or fewer is termed **ACUTE.**
- **AKI** ……subgroup of acute kidney diseases and disorders (AKD) in which changes in kidney function evolve within one week.
- There is a complex relationship between AKI and CKD. AKI can lead to CKD, and CKD increases the risk of AKI.

CLASSIFICATION RENAL DISEASES

- **Diseases** can be defined and classified according to many domains: structure, function, cause, duration, and outcomes



CLASSIFICATION RENAL DISEASES

ON THE BASIS OF FUNTION AND DURATION

- **AKI**….Increase in Serum Creatinine by 50% within 7 days, ***or*** increase in S.Cr by 0.3 mg/dL within 2 days ***or*** oliguria.
- **CKD**…. GFR <60 mL /min for > 3 months
- **AKD / AKI**…. GFR <60 mL / min for < 3 months ***or*** decrease in GFR by ≥35 % **or** increase in S.Cr by >50% for <3 months
- **NKD**…..GFR ≥ 60 mL/min, stable S . Creatinine, No damage

CLASSIFICATION RENAL DISEASES

ON BASIS OF ANATOMICAL STRUCTURE:

1. Glomerular diseases
2. Tubular diseases
3. Interstitial diseases
4. Congenital and developmental diseases
5. Cystic diseases
6. Vascular diseases
7. Systemic diseases involving renal system
8. Urinary tract infections
9. Renal Stones (calculi)
10. Renal tumors

PATHOPHYSIOLOGY OF RENAL INFECTIONS

- **Renal infections or urinary tract infections (UTI),** an infection in any part of urinary system….. Kidneys, bladder and Urethra.
- **Lower UTIs** affect the **bladder** (cystitis) and **urethra**.
- **Upper UTIs** (**pyelonephritis**) affect the **renal pelvis** and **kidneys**.
- If it is not possible to differentiate between a lower or upper UTI, then it is considered an **undifferentiated UTI**

PATHOPHYSIOLOGY OF RENAL INFECTIONS

- Most infection involve the **lower urinary tract**....bladder and urethra.
- **Women** are at greater risk .....50 fold more common
- **Age** : 20 – 50 years old adults

PATHOPHYSIOLOGY

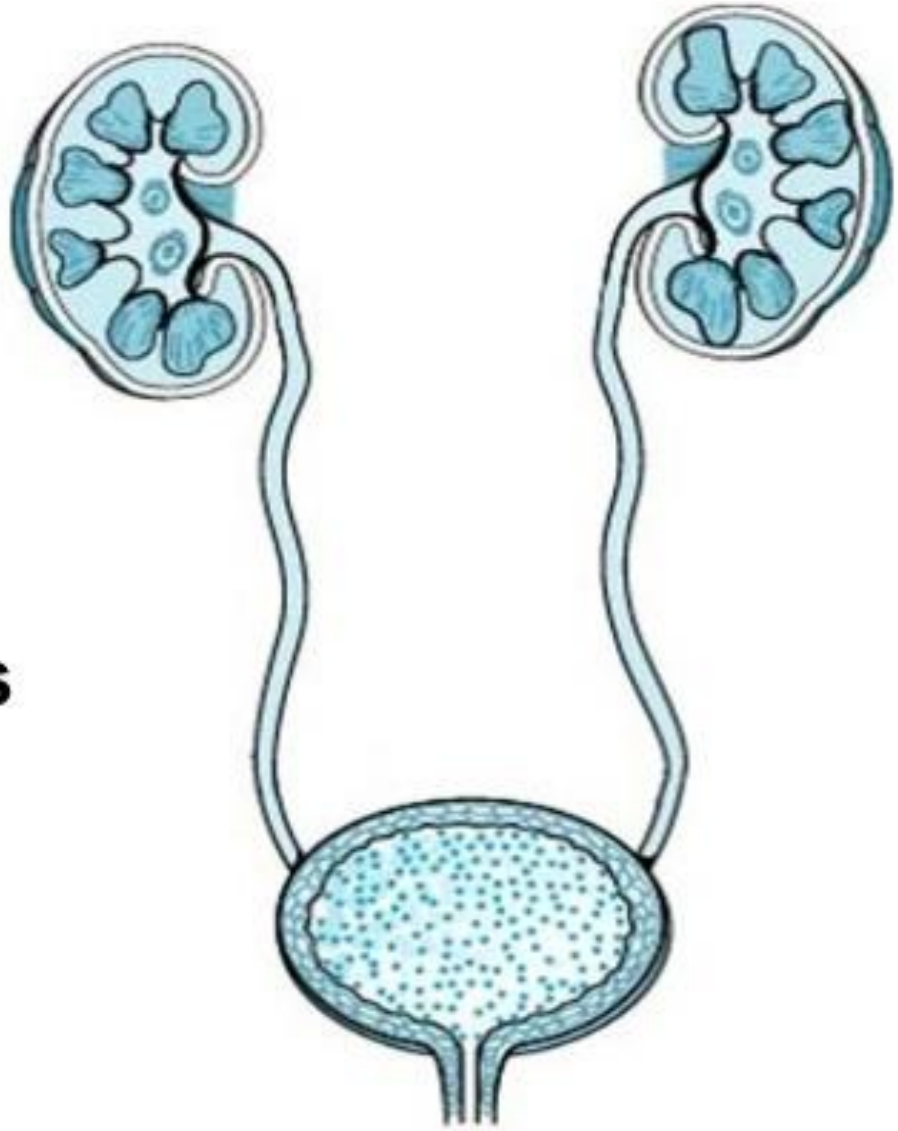
- **ETIOLOGY:** most common bacteria causing cystitis and Pyelonephritis are:
- **Gram – ive aerobic bacteria (most often)**
  - E . Coli…… 75 - 90 % cases
  - Klebsiella
  - Proteus
  - Pseudomonas aeruginosa
- **Gram +ive bacteria (less often)**
  - Staphylococcus saprophyticus
  - Enterococcus faecalis
  - Streptococcus (group B)
- **Rare** …..viruses (HPV, CMV, measles, mumps) and parasites

TYPES

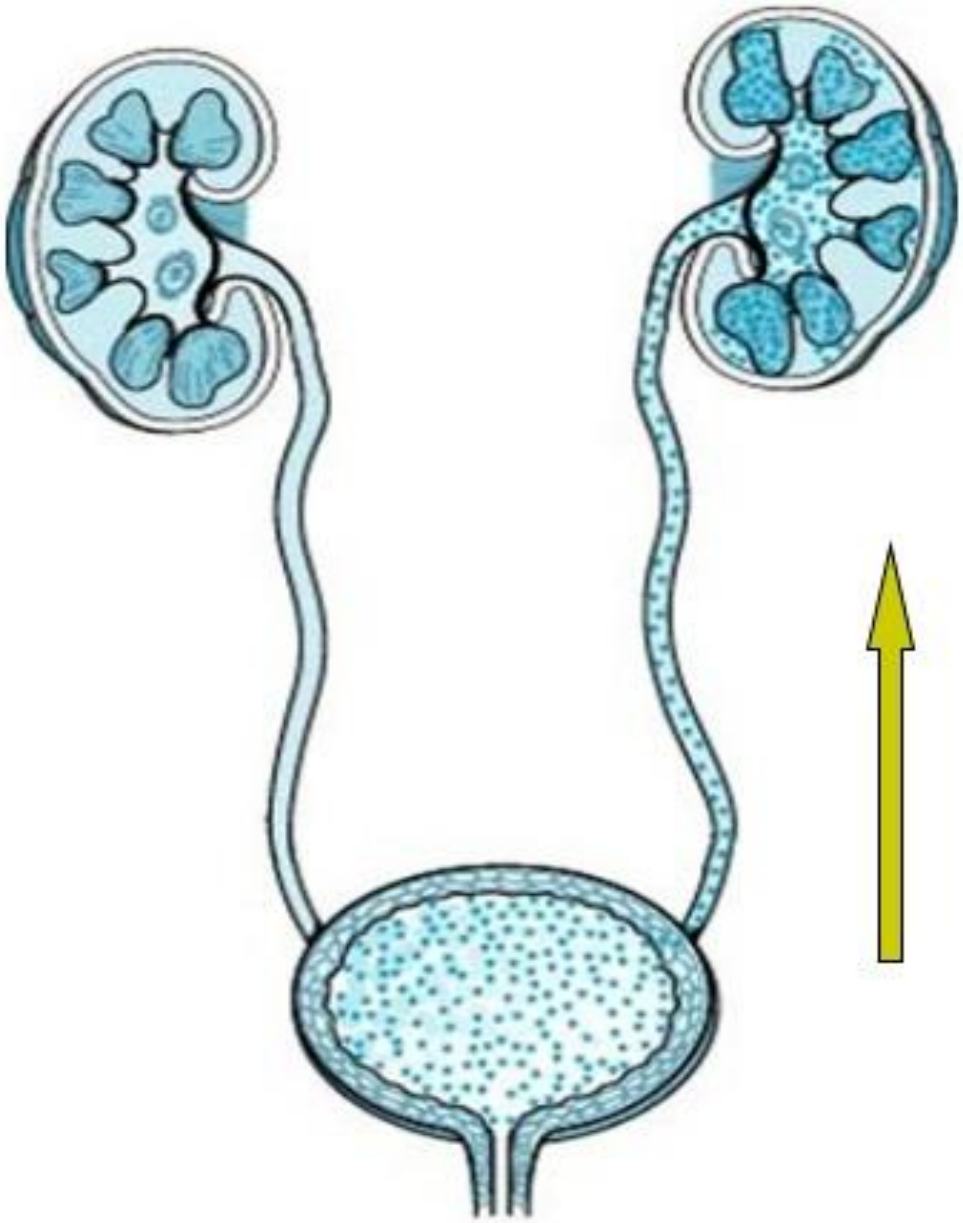
Urinary Tract Infection- Types

Urethritis Cystitis Prostatitis	Lower
Pyelonephritis Intrarenal & Perinephric abscess	Upper

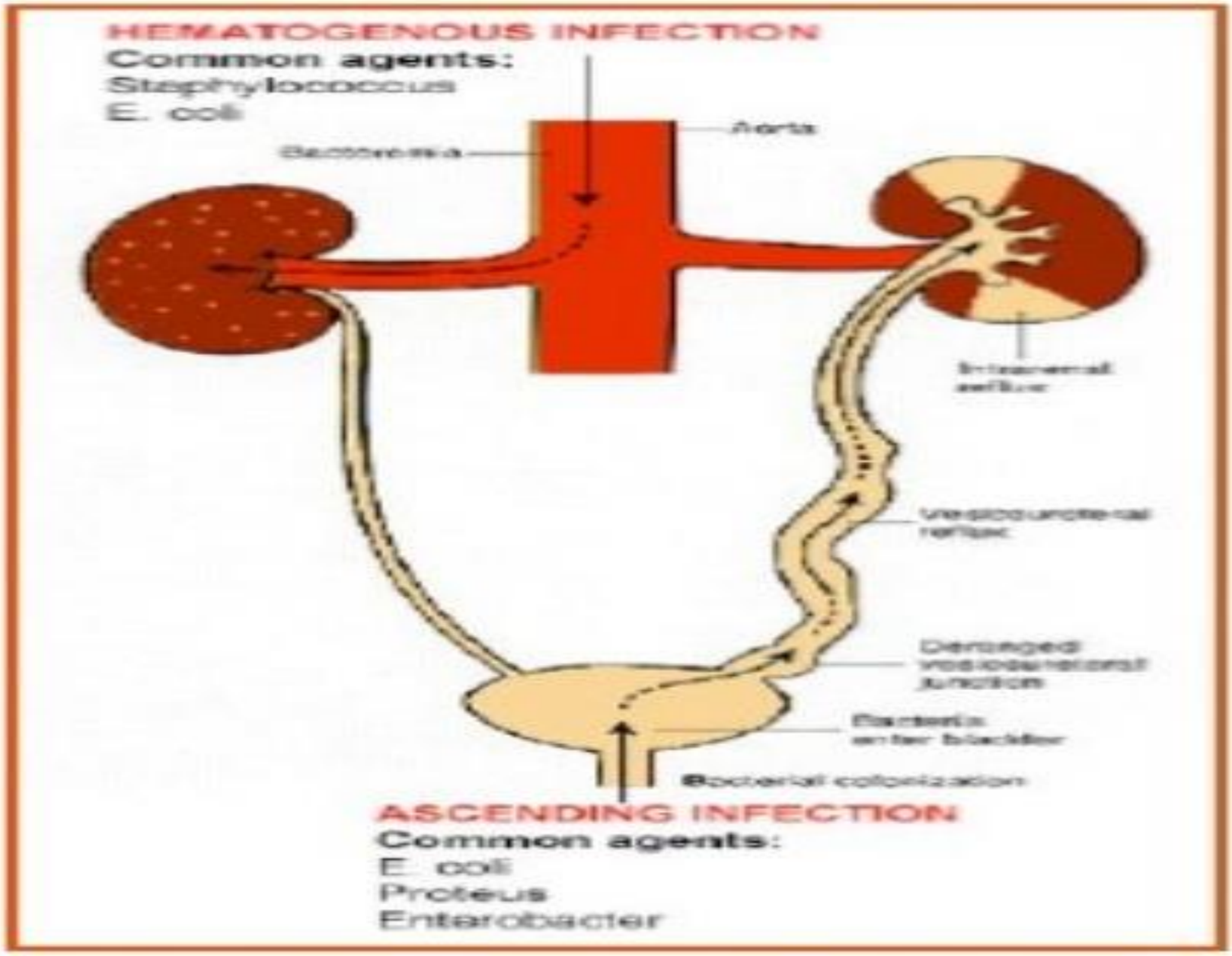
Cystitis



Acute Pyelonephritis



Pathways of renal infection



TREATMENT

- **Goal of treatment**……. Control of the infection and reduction of symptoms
- Acute symptoms resolve within 48 to 72 hours after appropriate treatment
- In elderly patients…. Prompt intervention is needed due to high mortality rate and permanent kidney damage

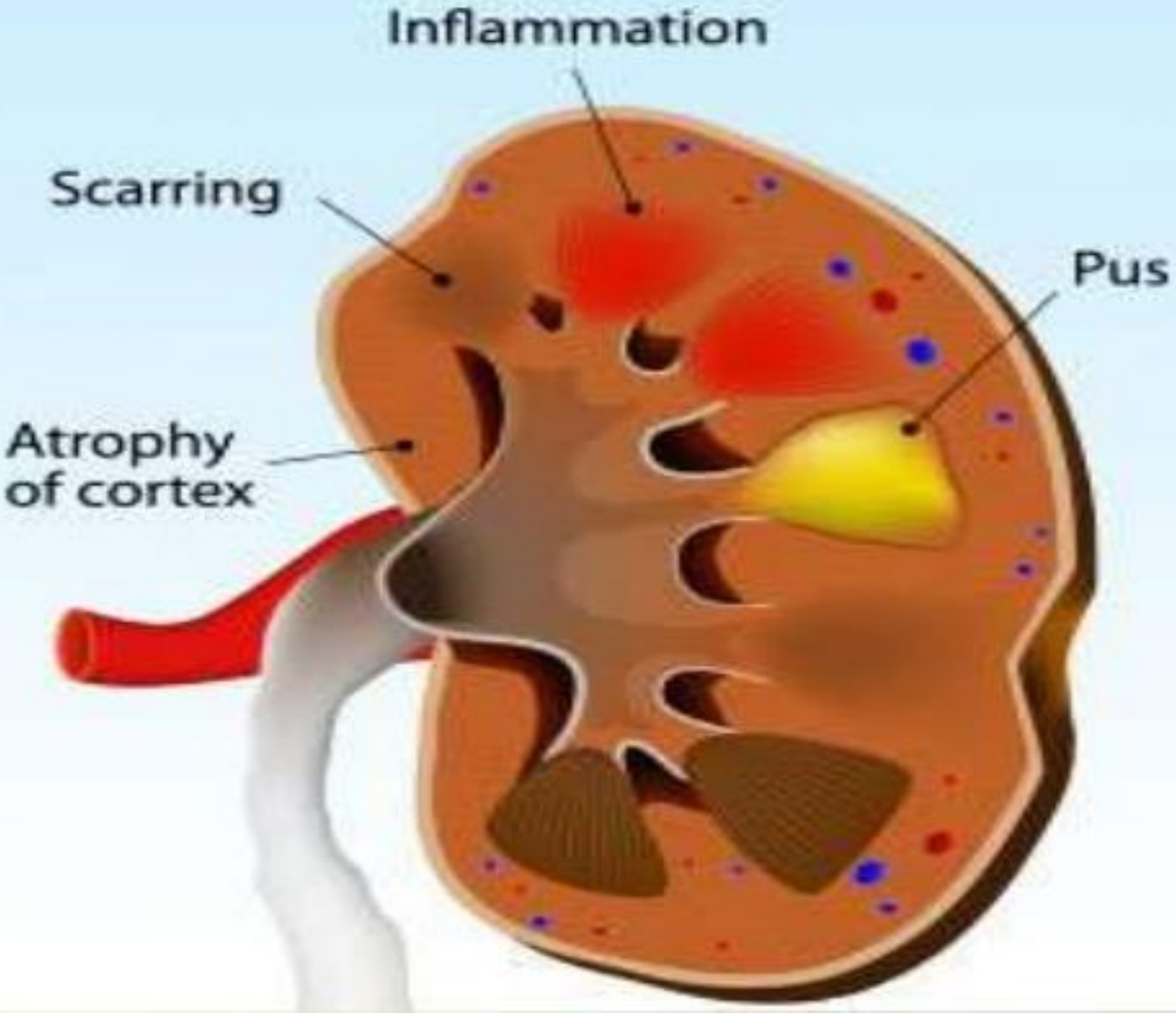
TREATMENT

- Proper **antibiotics** are selected to treat the infection.
- Proper monitoring of fluid intake
- Nutritional therapy
- Health education
- Monitoring and proper screening

TREATMENT OF CHRONIC PYELONEPHRITIS

- **Pyelonephritis**…..inflammation of the kidney and upper urinary tract that usually results from the bacterial infection of the bladder.

Pyelonephritis



TYPES OF PYELONEPHRITIS

- Acute
- Chronic
- Xanthogranulomatous

CHRONIC PYELONEPHRITIS

1. **Chronic obstructive pyelonephritis**…. Recurrent infection

2. **Reflux nephropathy**…… Vesico-ureteric reflux or Infections

TREATMENT

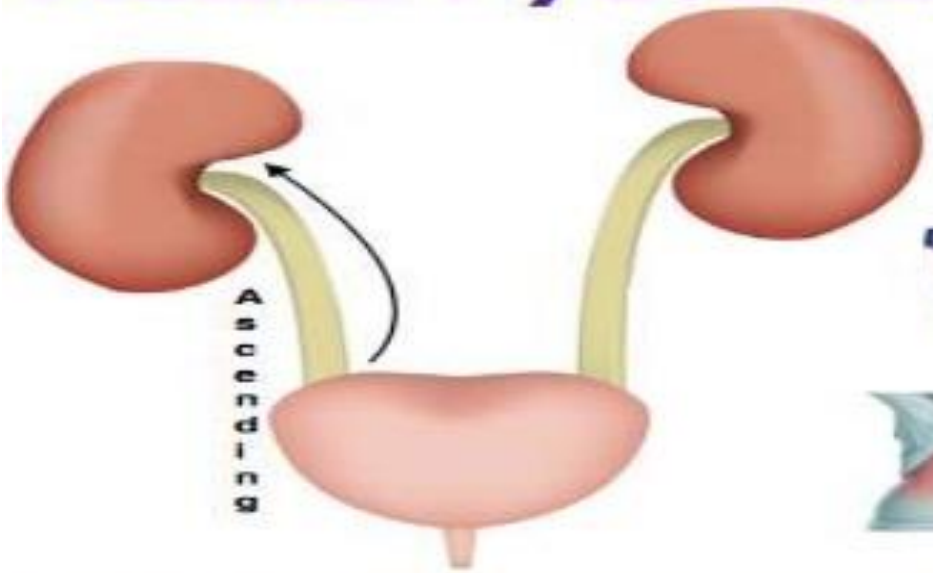
- Antibiotics.
- Careful watching - with regular blood tests, and BP measurement.
- BP or high cholesterol treatment.
- Repeated urine tests….. Monitoring renal function
- Medication to treat anemia

TREATMENT

- Low protein and high carbohydrate diet (low nitrogenous waste)
- Correction of fluid and electrolyte balance
- Dialysis …..filters wastes and water from the blood
- Renal transplant …… if < 20% of function

SUMMARY

Acute Pyelonephritis



Fever
Chills

Dysuria
Frequency
Urgency

Flank pain
CVA tenderness
Nausea and vomiting

Microbiology

Ascending (most common)
- *E. coli* (75% to 95%)
- *Proteus mirabilis*
- *Klebsiella pneumoniae*
- *Staphylococcus saprophyticus*

Descending (less common)
- Septicemia
- Infective endocarditis

Management

Oral (outpatient)
- Ciprofloxacin, Levofloxacin
- Trimethoprim-sulfamethoxazole

Parenteral (mild to moderate)
- Ceftriaxone
- Ciprofloxacin, Levofloxacin
- Aztreonam

Parenteral (severe)
- Cefepime
- Pipercillin-tazobactam
- Meropenem

THANK YOU