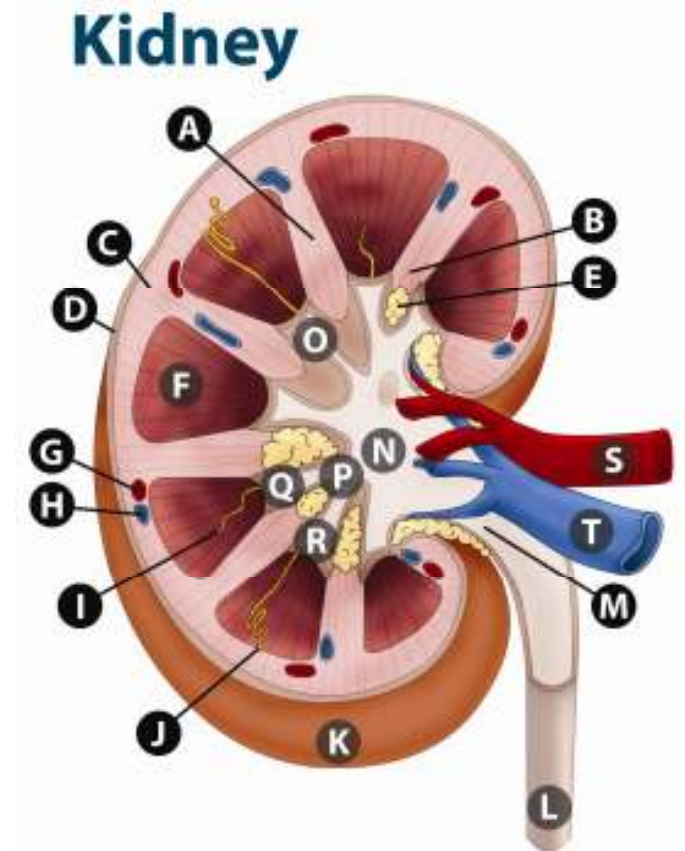


Pathologies of the Urinary System



Common features of renal disease

- Proteinuria
- Haematuria
- Hypertension
- Severe proteinuria (nephrotic syndrome)
- Acute nephritis
- Acute renal failure
- Chronic renal failure

Urinary tract infections (UTIs)

- Common in women
- In acute infection, the organisms are those normally colonising the perineum:
- E. coli - 65 to 80% of all UTIs
- Proteus
- Klebsiella
- Enterobacter
- Candida
- Enterococci
- Staphylococci - especially, Staph. saprophyticus in young, fit adults, especially women

Predisposing factors for UTIs

- Diabetes mellitus
- Pregnancy
- Impaired voiding of the bladder
- Genitourinary malformation
- Prostatic hypertrophy
- Renal stones

Conventional treatment of UTIs

- Antibiotics
- Trimethoprim
- Cephalosporins
- Nitrofurantoin
- Amoxicillin
- 4-quinolone (e.G. Ciprofloxacin)
- Advise the patient to take plenty of fluids.

Cystitis

- Clinical features
 - frequency
 - abrupt onset
 - cloudy, smelly urine
 - frequency
 - pain in the suprapubic region or lower back
 - suprapubic tenderness on examination

Cystitis & bladder infections

- The bladder is most commonly affected
- Females are more commonly affected than men
- At least 50% of women suffer a UTI sometime in their life

Cystitis & UTIs clinical features

- Dysuria, frequency, urgency and a sensation of incomplete bladder emptying: a very common presentation
- Lower abdominal pain: often a presentation in children and young adults
- Sudden development of incontinence - often a presentation in the elderly
- Haematuria
- Enuresis occurring in a child previously dry at night
- Non-specifically unwell if previously fit - presentation in infants and the elderly

Holistic treatments for Cystitis & UTIs

- Increase water consumption
- Cranberry Juice
- Pre intercourse douches with hamamelis and hydrastis
- Hydrastis tea pre intercourse
- Alkalinity Vs Acidity
- Avoiding sugars, refined COHs and concentrated juices
- Citrates: Vit C
- Bioflavonoids
- Vit A
- Zinc
- Choline
- Pessaries: Calendula, tea tree, mentha, hydrastis

Complementary treatments for Cystitis & UTIs

- *Arctostaphylos uva ursi*
- *Hydrastis*
- *Filipendula ulmaria*
- *Barosma betulina*
- *Juniperus communis*
- *Berberis vulgaris*
- *Piper cubeba*
- *Herniaria glabra* (smooth rupterwort)
- *Allium sativum*
- Corn silk
- *Equisetum*
- *Hydrangea*

Glomerulonephritis

- Glomerulonephritis may present clinically in one of a number of ways:
 - nephrotic syndrome
 - nephritic syndrome
 - acute or chronic renal failure
 - asymptomatic haematuria and/or proteinuria

Glomerulonephritis

Known aetiological factors for glomerulonephritis include:

- bacteria:
 - Staphylococcus spp.
 - Lancefield group A B-haemolytic streptococci
 - Streptococcus viridans
- viruses:
 - Coxsackie virus
 - Epstein Barr virus
 - hepatitis B virus
- parasites:
 - Plasmodium malariae
 - Schistosoma spp.
- drugs:
 - penicillamine
- host antigens

Clinical presentation of GN

- Nephrotic syndrome
- Nephritic syndrome
- Chronic renal failure
- Asymptomatic haematuria and/or proteinuria

Nephrotic syndrome

1. Proteinuria:

1. Greater than 3.0 g per 24 hours in adults
2. 0.05 g/kg/24 hours in children

2. Hypoalbuminaemia, with albumin concentration less than 30 g/L

3. Oedema, which is periorbital and in the upper limbs

This triad is commonly accompanied by hyperlipidaemia.

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Nephritic syndrome

Acute inflammation of the glomeruli

1. Haematuria
2. Uraemia
3. Oedema, which is usually facial
4. Hypertension is a common complication.

Chronic renal failure

The stages of chronic renal failure are:

- diminished renal reserve indicates a fall in the glomerular filtration rate (GFR)
- early renal failure is defined as a GFR < 30 ml/min
- late renal failure is defined as GFR < 10 ml/min
- end-stage renal failure (ESRF) is defined as GFR < 5 ml/min (End Stage Renal Failure)

Clinical features of CRF

- A wide range of clinical manifestations may occur in renal failure. Here, they are presented by system.
 - **gastrointestinal features**
 - **endocrine features**
 - **cardiovascular features**
 - **neurological features**
 - **haematological features**
 - **other features**

Management of CRF

- Restriction of dietary protein
- Control of blood pressure
- Treatment of anaemia
- Treatment of renal osteodystrophy
- Treatment of hyperlipidaemia
- Peritoneal dialysis or haemodialysis
- Renal transplantation

Holistic management of CRF

- (self study)

Pyelonephritis

"Pyelonephritis is an inflammation of the kidney and its pelvis as a result of infection."

Acute Pyelonephritis (self study)

Chronic Pyelonephritis (self study)

Clinical features

- **pain in the loin which radiates to the iliac fossa and suprapubic area.**
- **fever, rigors, vomiting**
- **urinary frequency**
- **painful micturition**
- **cloudy, offensive urine**
- **tenderness and guarding over the kidney**

Nephrolithiasis (Kidney stones)

Causes include:

- hypercalciuria
- hyperoxaluria
- hyperuricaemia
- cystinuria
- schistosomiasis –
 - in developing countries

Types of kidney stones

- Calcium oxalate stones
- Triple phosphate stones
- Uric acid stones
- Cystine stones

Types of kidney stones

(self study on types of kidney stones)

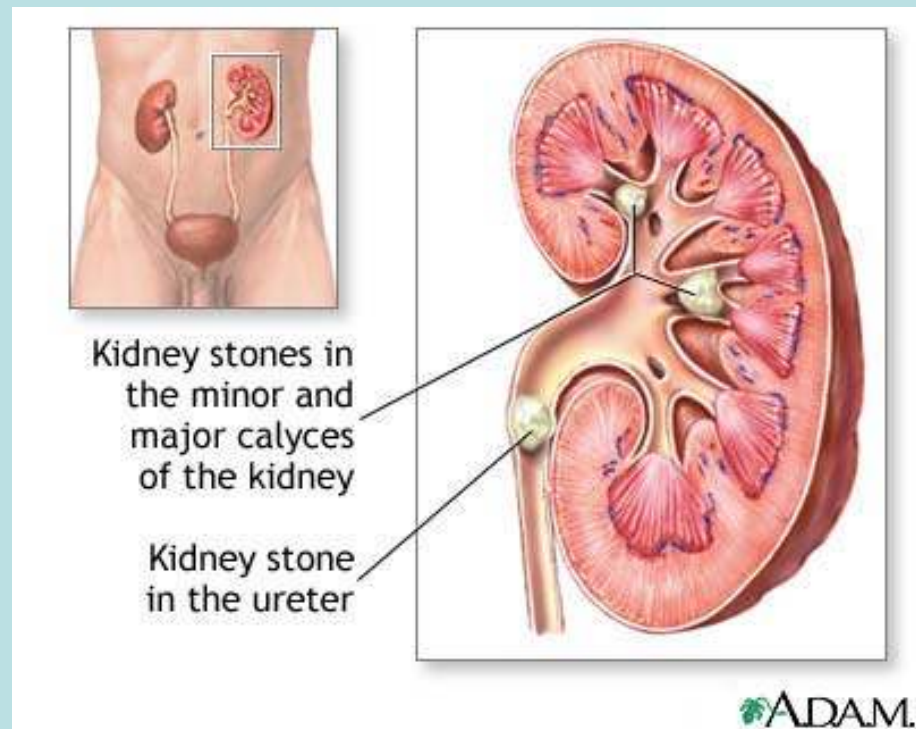
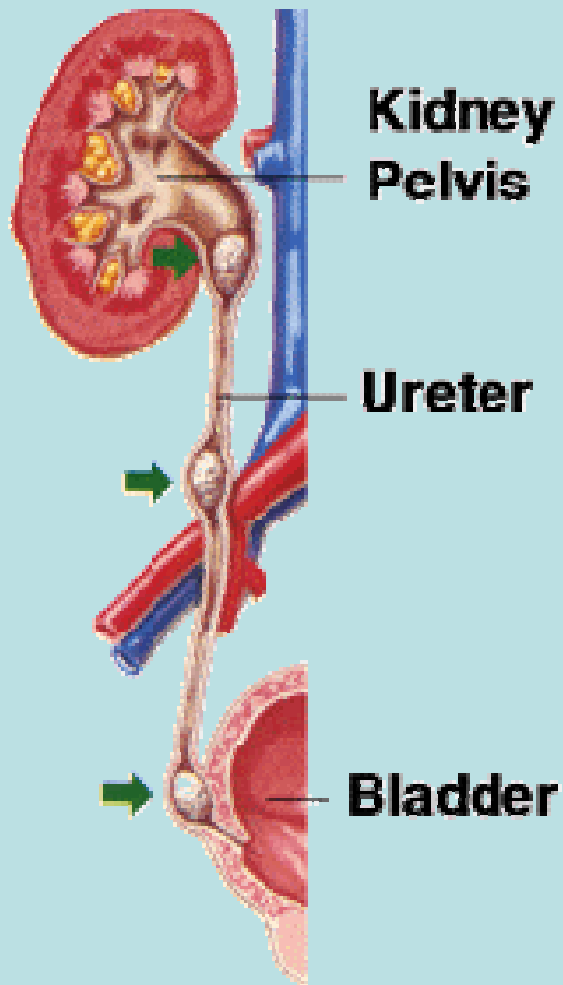
Pathogenesis of kidney stones

- Pre-existing conditions
 - increased serum calcium in hyperparathyroidism
 - increased serum uric acid in gout or following chemotherapy for leukaemia
 - decreased urinary volume in hot climates
- impaired drainage:
 - chronic urinary obstruction due to an enlarged prostate
 - hydronephrosis
- presence of abnormal constituents:
 - urinary infection producing epithelial sloughs upon which calculi may deposit
 - foreign bodies such as a urinary catheter
- **IDIOPATHIC!**

Clinical features of kidney stones

- Depends on location
 - Upper urinary tract: (self study)
 - Lower urinary tract: (self study)

Kidney stones transport



Treatment & management of kidney stones

- Conservative
(self study)
- Surgical
(self study)

Surgical approaches to kidney stones

- **Extracorporeal shockwave lithotripsy**
- **Ureteroscopy**
- **Percutaneous nephrolithotomy**
- **Pyelolithotomy**
- **Double J stenting**

Complementary approaches to kidney stones management

- Lifestyle:
 - ↑ Water
 - ↑ Fiber, magnesium
 - ↓ Sugars, alcohol, animal protein, fat, Vit-D enriched dairy products
 - ↑ B6, citrate formulations
 - Cranberry juice (reduces ionised Ca)
 - Ca supplementation ↑ oxalate formation
 - Citrates reduce saturation of Ca oxalate and Ca phosphate
 - Vit K inhibits stone formation (vegetarians & low incidence thus high on leafy veg)

Complementary approaches to Treating Calcium stones

- Green leafy vegetables
- Inc Magnesium to Calcium ratio:
 - (barley, bran, corn, buckwheat, rye, soy, oats, brown rice, avocado, bananas, cashews, coconut, peanuts, sesame, lima beans, potatoes)
- Dec purines:
 - meat, fish, poultry, yeast
- Supplements:
 - Vit B6, K, Magnesium, Calcium
- Botanicals:
 - Aloe vera
- Avoid: Aluminium-containing antacids

Treating Uric Acid Stones

- ↓ Purines:
 - Organ meats, shellfish, yeast, herrings, sardines, mackerel, anchovies, also dried spinach, asparagus, fish, poultry, mushrooms
- Supplements:
 - Folic acid
- Alkalinize urine:
 - Citrates, bicarbonate

Treating Magnesium Ammonium Phosphate Stones

- Eradicate infections, ie chronic cystitis
- Acidify urine:
 - Ammonium chloride (100-200mg)
- General advice observed above
- Hydration and pelvic exercises
- Address hormonal imbalances

Treating Cystine Stones

- ↓ methionine-rich foods:
 - Soy, wheat, dairy (esp processed), fish, meat, lima beans, garbanzo beans, mushrooms,
 - All nuts except: coconut, hazelnuts, sunflower seeds
- Alkalinize urine to 7.5-8.0(see above)

Treating Oxalate stones

- Reduce oxalate-rich foods:
 - beets
 - chocolate
 - coffee
 - cola
 - nuts
 - rhubarb
 - spinach
 - strawberries
 - tea
 - wheat bran

Systemic diseases associated with kidney damage

- Diabetes
- Connective tissue diseases
- Gout
- Amyloid
- Hypertension
- Pharmacological / iatrogenic
- Polycystic diseases
- Primary and metastatic tumors

End

Pathologies

of the

Urinary System

