

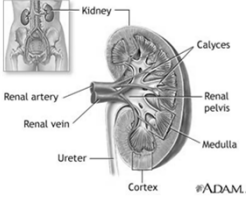
Urinary Disorders

Lemone and Burke Chapters 27, 28, 29, 48

Urinary Disorders

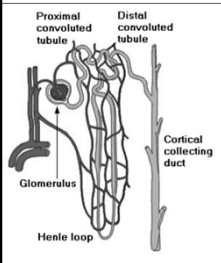
- **Objectives**
- Review anatomy and physiology
- Discuss etiology, pathophysiology, manifestation, management and nursing diagnosis of:
 - Renal calculi
 - Polycystic kidney disease
 - Glomerulonephritis
 - Prostatitis
 - BPH

Urinary System A & P



- **Organs include:**
 - Paired kidneys
 - Paired ureters
 - Bladder
 - Urethra

Urinary System A & P



- Function of kidneys is to:
 - Form urine
 - Excrete metabolic waste
 - Regulate acid base balance
 - Secrete hormones
- Nephrons
 - Glomerulus
 - Proximal convolute tubules
 - Loop of Henle
 - Distal convoluted tubules

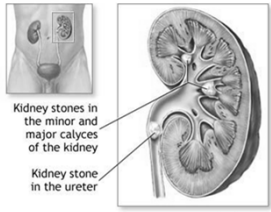
Normal Lab values

BUN: 8 to 25 mg/dl	Glucose (fasting plasma)
Creatinine: 0.5 to 1.5 mg/dl	70-110 mg/dl
GFR: 120 mL/min	Hemoglobin
Sodium: 135 to 145 mmol/L	• Male: 13.8-17.2 g/dl
Potassium: 3.5-5.5 mEq/L	• Female: 12.1-15.1 g/dl
Chloride: 97-110 mmol/L	HCT
	• Male: 40-50%
	• Female: 36-44%

Urinary calculi

<ul style="list-style-type: none"> • Lithiasis – stone formation <ul style="list-style-type: none"> • Nephrolithiasis • Urolithiasis • Ureterolithiasis 	<ul style="list-style-type: none"> • Incidence and risk factors <ul style="list-style-type: none"> • Industrialized country • In US – south or Midwest • males > females • Family hx • Dehydration • Immobility • Ca, oxalate, protein intake • Gout, urinary stasis, hyperparathyroidism
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Renal Calculi - Pathophysiology



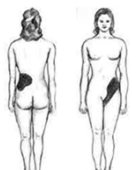
Kidney stones in the minor and major calyces of the kidney
Kidney stone in the ureter

#ADAM


- 3 contributing factors:
 - Super saturation
 - Nucleation
 - Lack of inhibitory substances
- Composition:
 - 75-80% are calcium stones
 - 5-10 % Uric acid stones
 - 15 -20 % Struvite stones
 - Cystine stones

Manifestation Renal Calculi

- Kidney stones:
 - Often asymptomatic
 - Dull aching flank pain
 - Microscopic hematuria
 - UTI
- Bladder stones:
 - may be asymptomatic
 - Dull suprapubic pain
 - Gross or microscopic hematuria
 - UTI
- Ureteral stones:
 - Renal colic
 - Acute severe flank pain
 - Radiates to suprapubic region, groin and external genitals
 - N/V, pallor, cool clammy
 - UTI



Complication of Renal Calculi



Kidney
Renal pelvis
Ureter
Urinary bladder
Urethra

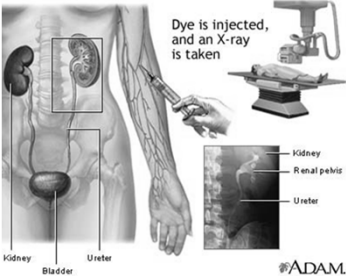
#ADAM

- UTI
 - Chills, fever, urgency, frequency, dysuria
- Hydronephrosis
 - Acute
 - Acute colicky pain, may radiate into groin and abdomen
 - Hematuria, pyuria
 - Fever, N/V
 - Chronic
 - Dull, aching flank pain
 - Hematuria, pyuria
 - Fever
 - Palpable flank mass

Diagnosis Renal Calculi

- Symptoms
- Lab tests
 - UA
 - Serum calcium, phosphorus, uric acid levels
 - Urine calcium uric acid, oxalate levels
 - Chemical analysis of stones
- Radiology tests
 - KUB
 - Renal ultrasound
 - CT
 - IVP

Diagnosis - IVP



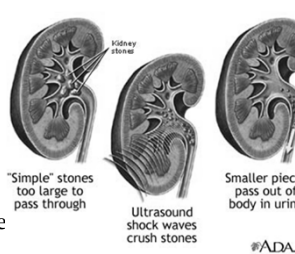
The diagram illustrates the IntraVenous Pyelography (IVP) procedure. On the left, a human torso shows the internal organs: Kidney, Bladder, and Ureter. On the right, a hand is shown injecting dye into a vein in the arm. A text box states: "Dye is injected, and an X-ray is taken". Below this, an X-ray image shows the renal pelvis and ureter, with labels: Kidney, Renal pelvis, and Ureter. The ADAM logo is at the bottom right.

Management Renal Calculi

- Medication
 - Analgesic
 - Prevention of further calculi
 - Antibiotics
- Nutrition and fluid
 - Oral and IV fluids
 - Limit foods that can contribute to stone formation

Management Renal Calculi

- **Extracorporeal shock wave lithotripsy (ESWL)**
 - Sound shock wave to break stone into small fragments
 - Under conscious sedation
 - Strain all urine to monitor passage of stone fragments
 - Bruising may occur on flank



"Simple" stones too large to pass through

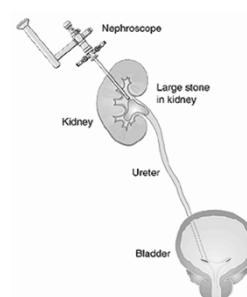
Ultrasound shock waves crush stones

Smaller pieces pass out of body in urine

#ADAM

Management Renal Calculi

- **Percutaneous ultrasonic lithotripsy**
 - Nephroscope
 - Stone fragmented using ultrasonic waves



Nephroscope

Large stone in kidney

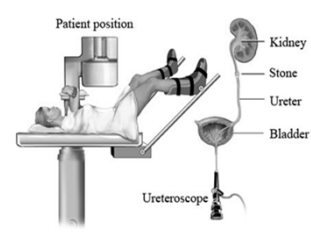
Kidney

Ureter

Bladder

Management Renal Calculi

- **Laser lithroscopy**
 - Nephroscope or ureteroscopy
- **Retrograde ureteroscopy**
 - Stones are manually removed
- **Surgery - rare**



Patient position

Kidney

Stone

Ureter

Bladder

Ureteroscopy

Nursing Care Renal Calculi

- H & P
- Pain control
- Adequate fluid intake
- Strain urine
- Teaching:
 - Dietary changes
 - Adequate fluid intake
 - Physical activity

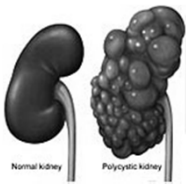
Nursing Diagnosis – Renal Calculi

- Acute pain
- Impaired urinary elimination
- Fluid volume deficit
- Activity intolerance
- Knowledge deficit
- Risk for infection

Polycystic Kidney Disease

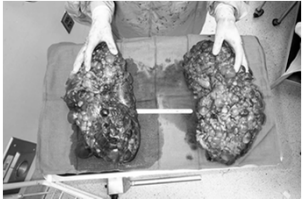
- Hereditary – cyst formation and kidney enlargement
- 2 forms
 - Autosomal recessive
 - Autosomal dominant
- Incidence
 - Autosomal dominant affects 1 in 300-1000 people in US
 - Accounts for 4 % ESRD

Polycystic Kidney Disease



- **Pathophysiology**
 - Fluid filled cysts affect nephrons
 - Renal blood vessels and nephrons compressed
 - Fibrotic, atrophic, scarred tissue

Polycystic Kidney Disease



- **Manifestation**
 - Slow progression
 - Flank pain, hematuria,
 - UTI, calculi, HTN,
 - CRF

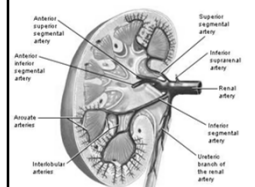
Polycystic Kidney Disease - Management

- **Diagnosis**
 - Renal US
 - IVP
 - CT
- **Supportive management**
 - Avoid further renal damage
 - Stress increased fluid intake
 - Control HTN
 - Genetic counseling

Polycystic Kidney Disease – Nursing Dx

- Knowledge deficit
- Risk for ineffective coping
- Chronic /acute pain
- Constipation
- Risk for infection
- Potential for HTN
- Potential for renal failure
- Excess fluid volume

Glomerulonephritis



- Inflammation of glomerular capillary membrane
- Streptococcal or viral infection
- Immune complexes trapped in glomerular membrane
- A leading cause of CRF in US

Glomerulonephritis - Manifestation

- Acute disease onset rapid
 - Hematuria, proteinuria, salt and H₂O retention
 - Brown urine
 - Edema – esp. periorbital
 - HTN
 - Fatigue
 - Anorexia
 - N/V
 - Pulmonary infiltrates

Glomerulonephritis

- **Nephrotic syndrome**
 - Proteinuria, hypoalbuminemia, hyperlipidemia,
 - Glomerulonephropathy
 - Edema
 - Risk of thromboemboli
 - Risk for renal impairment

Glomerulonephritis

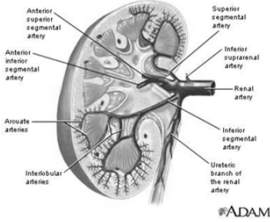
- **Good-pasture syndrome**
 - Auto-immune disorder
 - Unknown etiology
 - Antibodies form
 - Mainly affects young men
 - Causes hematuria, proteinuria, edema

Glomerulonephritis

- **Chronic glomerulonephritis**
 - Progressive
 - Kidneys decrease in size
 - Course varies

Glomerulonephritis - Diagnosis

- Streptococci detection
 - Throat or skin culture
 - Antistreptolysin O (ASO) titer
- ESR
- KUB
- Kidney scan
- Biopsy
- BUN
- Creatinine
- Creatinine clearance
- Serum electrolytes
- UA



The diagram illustrates the renal vasculature. Labels include: Anterior superior segmental artery, Anterior inferior segmental artery, Arcuate arteries, Interlobular arteries, Superior segmental artery, Inferior segmental artery, Renal artery, and Ureteric branch of the renal artery. The ADAM logo is present at the bottom right of the diagram.

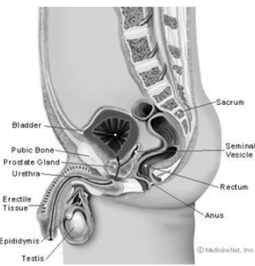
Glomerulonephritis- Management

- Medication
 - Antibiotics
 - Immunosuppressive therapy
- Treatment
 - Bedrest
 - Antihypertensive meds
 - Na , K, and protein restriction
 - Diuretics
 - Plasmapheresis
 - Dialysis

Glomerulonephritis –Nursing Dx

- Excess fluid volume
- Ineffective tissue perfusion
- Risk for imbalanced nutrition
- Ineffective protection
- Risk for ineffective therapeutic regimen management
- Fatigue
- Ineffective role performance

Prostatitis



- Inflammation of prostate gland
 - Acute bacterial prostatitis
 - Chronic bacterial prostatitis
 - Chronic prostatitis
 - Prostatodynia

Labels in diagram: Bladder, Pubic Bone, Prostate Gland, Urethra, Epididymis, Testis, Sacrum, Seminal Vesicle, Rectum, Anus.

Prostatitis

- Diagnosis
 - Cultures
 - X-ray, US
- Medications
 - Antibiotics
 - NSAIDS
 - Anticholinergics
 - Muscle relaxants

Prostatitis

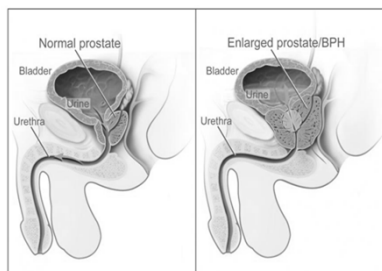
- Nursing care
 - Symptom management
 - Sitz bath or local heat
 - NSAIDS
 - Increase fluid intake
 - Regular BM
 - Increase fiber intake
 - Finish antibiotic therapy

Benign Prostate Hyperplasia (BPH)

- Age related non-malignant enlargement of the prostate gland
- Begins age 40-45
- Affects 50% men >60 years
- Risk factors:
 - Age
 - Family Hx
 - Race
 - Diet

BPH - Pathophysiology

- Precondition:
 - age >50,
 - Testes
 - Hyperplasia
 - Hypertrophy



BPH- Manifestation

- Diminished force of urinary stream
- Hesitancy in initiating urinary stream
- Post void dribble
- Sensation of incomplete emptying
- Urinary retention
- Nocturia
- Frequency
- Urgency and urge incontinence
- Dysuria

BPH - Complications

- Bladder distension
- Infection
- Hydronephrosis
- Renal insufficiency



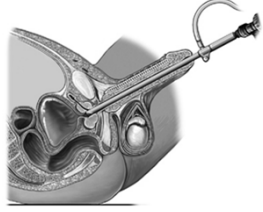
BPH - Diagnosis

- Physical examination
 - DRE
 - Post-void catheterization
- Tests
 - BMP
 - UA
 - PSA
 - KUB/IVP

BPH - Management

- Medication
 - Anti-androgen
 - Alpha-adrenergic antagonist
 - herbal
 - Meds to avoid: antihistamines, anticholinergics
- Surgery
 - Criteria:
 - Chronic bladder infection
 - Acute urinary retention
 - Hematuria
 - Hydronephrosis
 - Bladder neck obstruction syndrome (frequency, urgency)

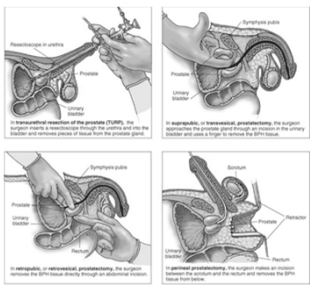
BPH - Surgery



- Transurethral microwave thermotherapy
- TUNA
- TURP
- TUIP
- YAG

BHP-Surgery

- Open surgery
 - Large prostate
- Abdominal wall
- Perineal floor

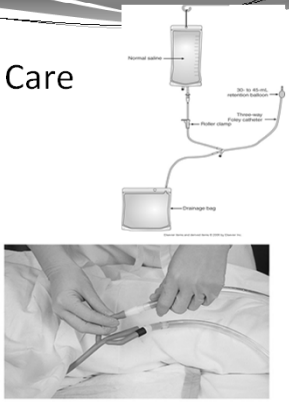


BPH – Surgery Nursing Care

- Pre - op
 - Assess knowledge of procedure
 - Explain procedure and post op expectations
- Post-op
 - VS
 - I+O
 - Catheter patency
 - Pain management
 - Labs
 - SCD
 - Encourage fluid intake

BPH – Surgical Nursing Care

- Continuous bladder irrigation (CBI)
 - Purpose :
 - Traction on prostate
 - wash out clots
 - Care
 - Accurate I+O
 - Assess urine
 - Assess VS
 - Explain CBI to pt
 - Assess catheter q 1-2 hrs
 - Assess labs: H/H, Na



The diagram shows a 'Normal saline' reservoir connected to a 'Three-way Foley catheter' which is inserted into the bladder. The catheter has an 'Irigator catheter' and a 'Drainage bag'. A note says 'Do not allow irrigation solution to backflow'. Below the diagram is a photo of hands performing a sterile technique to attach the irrigation tubing to the irrigator port of the Foley catheter. A caption reads: 'Action 6. Attaching irrigation tubing to irrigator port of three-way Foley catheter using sterile technique.'

BPH – Nursing Dianosis

- Knowledge deficit
- Acute pain
- Urinary retention
- Risk for infection
- Risk for imbalanced fluid volume

NCLEX


- The nurse is instructing a client with oxalate renal calculi. Which foods should the nurse urge the client to avoid?
 - A. Citrus fruits, molasses, and dried apricots
 - B. Milk, cheese, and ice cream
 - C. Sardines, liver, and kidney
 - D. Spinach, rhubarb, and asparagus

NCLEX

- The nurse is caring for a client with renal calculi. Which is the most important nursing action?
 - A. Limit fluid intake at night
 - B. Strain the urine at each voiding
 - C. Record the client's blood pressure
 - D. Administer analgesic every 3 hours


Questions?????

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PAW
"It's quite common with men your age. You've got a silver duct tapeworm."


Renal calculi – case study



- David Foster, 28 y/o carpenter admitted w severe right sided flank pain
- Tests ordered?
- Assessment findings?
- Management?
- Nursing Dx?


Nursing care of client having Lithotripsy

Glomerulonephritis – Case study



- Tanesha Johnson 29 y/o student teacher presents to her provider w c/o brown frothy urine.
- Tests ordered?
- Assessment findings?
- Management?
- Nursing Dx?

Benign Prostate Hyperplasia



- Frank Johnson 65 y/o retired bank manager c/o urinary frequency – small amounts only
- Tests ordered?
- Assessment findings?
- Management?
- Nursing Dx?
