



# UROLOGY

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# Infection & Inflammatory Disorders

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- 40% nosocomial
- Escherichia coli; immunosuppress, DM, mult antibiotics -viral, fungal, parasites
- Complicated- coexisting stones, DM, neuro disease, obstructions, catheters
- Relapse, reinfections



# UTI

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- Defense mechanisms
- Predisposing factors
- Sources of UTI- ascending, gram -, nosocomial, abnormal urinary tract



# Cystitis

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- Etiology- anatomic structure & pathologic changes in females, older males, young children
- S/S- frequency, urgency, suprapubic pain, foul smelling urine, pyuria, dysuria
- Asymptomatic bacteriuria- hematuria, fatigue, anorexia, cognitive changes



# Cystitis

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- Dx: WBC in u/a, urine C&S, gram stain, eval of urinary tract
- Meds: Bactrim, Septra, Cipro, Macrochantin, Keflex, Pyridium
- Single dose or 1-3 day therapy
- UTI with fever, flank pain or chronic-longer therapy
- Prophylactic therapy



# Nursing Care: Cystitis

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- Health promotion: identify hi risk pts, teaching fld I, hygiene, empty bladder freq
- Prevent nosocomial infection
- Increase fld I, avoid bladder irritants, teach drug therapy & s/e, teach s/s UTI
- Follow up care with urine C&S, can relapse in 1-2 weeks



# Acute Pyelonephritis

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- Acute or chronic inflammation of renal pelvis or parenchyma of kidney
- Infection ascends from lower urinary tract
- Often, preexisting factor
- Chronic pyelonephritis- starts in medulla, spreads to cortex, heals, fibrosis, scars



# Acute Pyelonephritis

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- S/S: mild lassitude, s/s cystitis, sudden fever, chills, vomiting, malaise, flank pain, costovertebral tenderness on affected side
- CBC- leukocytosis, incr banded neutrophils, u/a- pyuria, bacteriuria, hematuria, wbc casts
- Bacteremia, septic shock





# Pyelonephritis

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- Dx- u/a, C&S, Gram's stain, WBC, blood C&S, flank pain, ultrasound, CT scan
- Consider contributing factors, IVP later
- Antibiotics 14-21 days, rx of relapse with 6 wks or prophylactic antibiotics
- Evaluate with urine C&S



# Nursing Care: Pyelonephritis

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- Health Promotion: stress reg med care
- Teach: continue med, importance of follow-up urine C&S, s/s relapse, drink 8 glasses water minimum, rest
- Treat s/s- hyperthermia, pain, see NCP 46-1



# Chronic Pyelonephritis

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- Predisposing factors: chronic UTIs, obstruction, neurogenic bladder, vesicoureteral reflux
- Chronic inflammation & scarring, renal pelvis & calyces dilated, deformed
- Destruction of nephrons->renal insuff
- End stage chronic renal failure



# Urethritis

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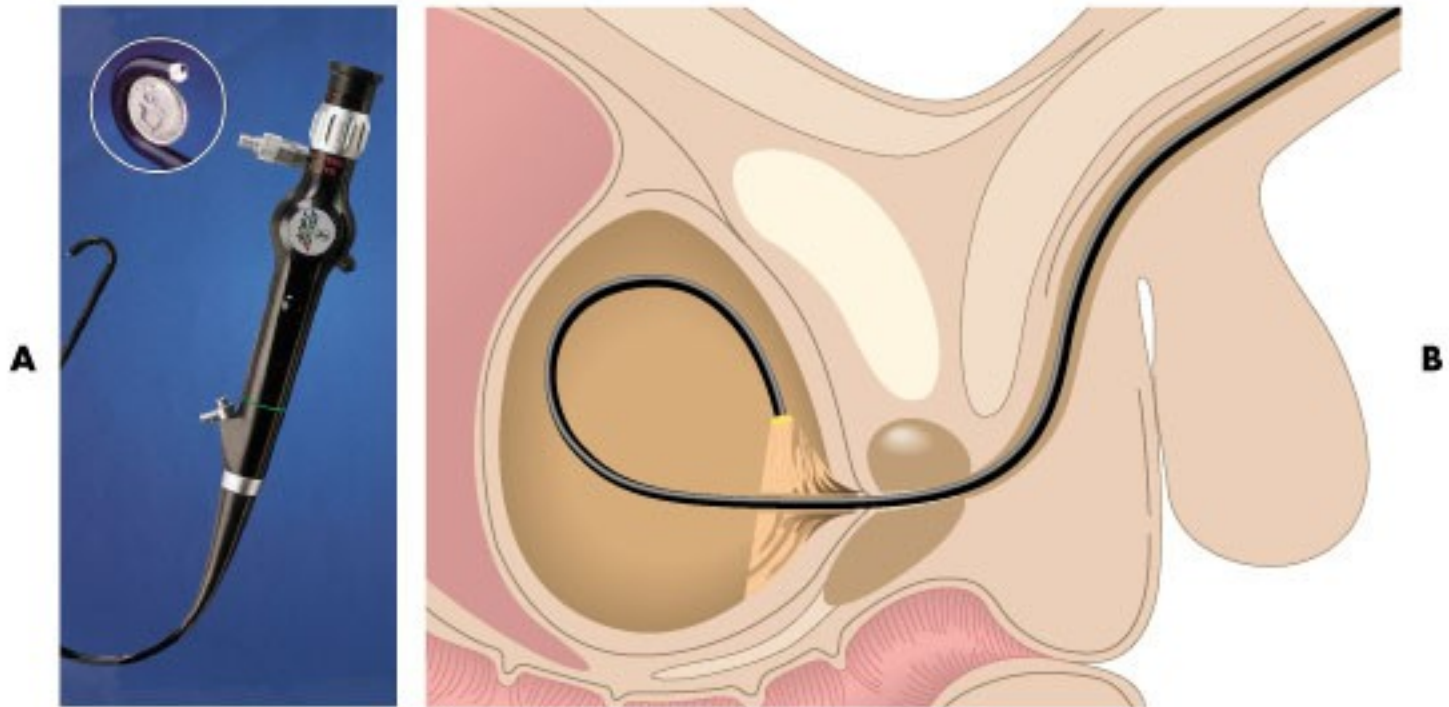
- S/S same as cystitis, discharge, urethra tender, bacteria in edematous urethral tissue & don't appear in u/a
- Causes: viral, Trichomonas & monilia infection, Chlamydia & gonorrhea
- Split urine C&S, C&S discharge
- Rx: antibiotics, sitz bath, proper cleansing, no vaginal deodorant, avoid sex



# Urethral Syndrome

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- Acute urethral syndrome: dysuria, urgency, frequency with bacteriuria
- Bacteriuria: E. coli, enterococci, staph
- Chlamydia, gonorrhea if few bacteria
- R/O vaginitis
- TX depends on cause



**Figure 42-10** Cystoscopic examination of the bladder in a man. **A**, Flexible Cysto Nephroscope. **B**, Scope inserted into bladder. (Courtesy Circon Corporation, Santa Barbara, CA.)

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# Renal Tuberculosis

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- Secondary to TB of lung, onset 5-8 later
- Initially, no s/s, low fever, fatigue
- Lesions ulcerate, spread to bladder-> s/s cystitis; may calcify-> lumbar & iliac pain, hematuria, renal colic
- Dx: urine C&S, IVP
- Complications: strictures, scarring renal parenchyma, renal failure



# Glomerulonephritis

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- Inflammation of glomerulus with tubular, interstitial & vascular changes
- Immunologic, antibody induced injury
- Anti-GBM antibodies stimulated by structural alteration of GBM or reaction to virus & results in deposits in GBM
- Antibodies react with nonglomerular antigens & randomly deposited, look “lumpy bumpy”





# Glomerulonephritis

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- Accumulation of antibody, antigen, complement in glomeruli-> tissue injury
- Complement activation-> leukocytes, release of histamine & vasoactive amines, clotting mechanism activated
- S/S: hematuria, u/a has WBC, RBC, casts, proteinuria, elev BUN, creatinine



# Acute Poststreptococcal Glomerulonephritis (APSGN)

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- 5-21 days after skin or throat infection
- Group A Beta hemolytic streptococci
- Antibodies to strep develop->inflam-> decreased filtration of metabolic waste, & increased permeability protein
- S/S: none or generalized edema, oliguria, hi BP, "rusty" hematuria, proteinuria, flank pain



# APSGN

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- Dx: H&P, u/a, CBC, BUN, creat, albumin, ASO titer, renal biopsy
- Nsg Care: rest, Na & fld restriction, diuretics, antihypertensive meds, lo P diet, antibiotics if have strep
- Encourage early tx of sore throat & skin lesions, teach good hygiene & take all antibiotics



# Rapidly Progressing Glomerulonephritis (RPGN)

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- Renal failure occurs within weeks
- Occurs as compliment of inflammatory disease, complication of systemic disease (Lupus), idiopathic, or assoc with drugs (PCN)
- Manage fld overload, hi BP, uremia
- Dialysis & transplant but RPGN can reoccur



# Nephrotic Syndrome

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- Causes: glomerulonephritis, infections, multisystem diseases, neoplasms, allergens
- S/S: periph edema, proteinuria, hi lipids, lo albumin, ascites, anasarca, altered immune response -> infection, hypocalcemia, loss of clotting factors-> hypercoagulability, thrombus formation esp R renal vein, PE



# Nephrotic Syndrome

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- Tx: relieve edema, control disease
- ACE inhibitors, NSAIDs, lo Na diet, loop diuretic
- Lipid lowering agents
- Anticoagulants if thrombus
- Corticosteroids & Cytosin



# Nursing Care

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- Assess edema: daily wt, I&O, measure girth
- Skin care, prevents trauma->weeping
- Monitor diuretic therapy, labs
- Lo protein-> malnourished, anorexic, lo Na & P diet; assess dietary needs, sm freq feedings
- Prevent infection
- Altered body image- psychol support

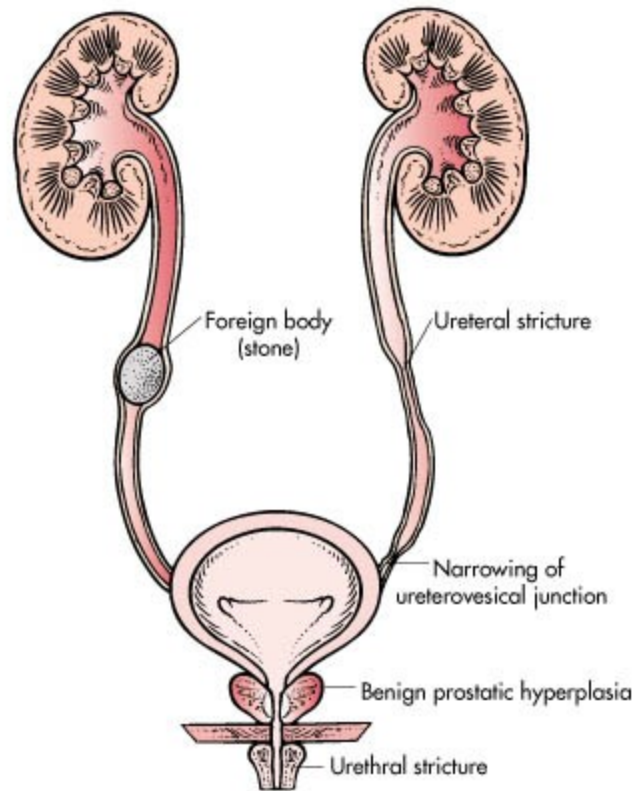


# Obstructive Uropathies

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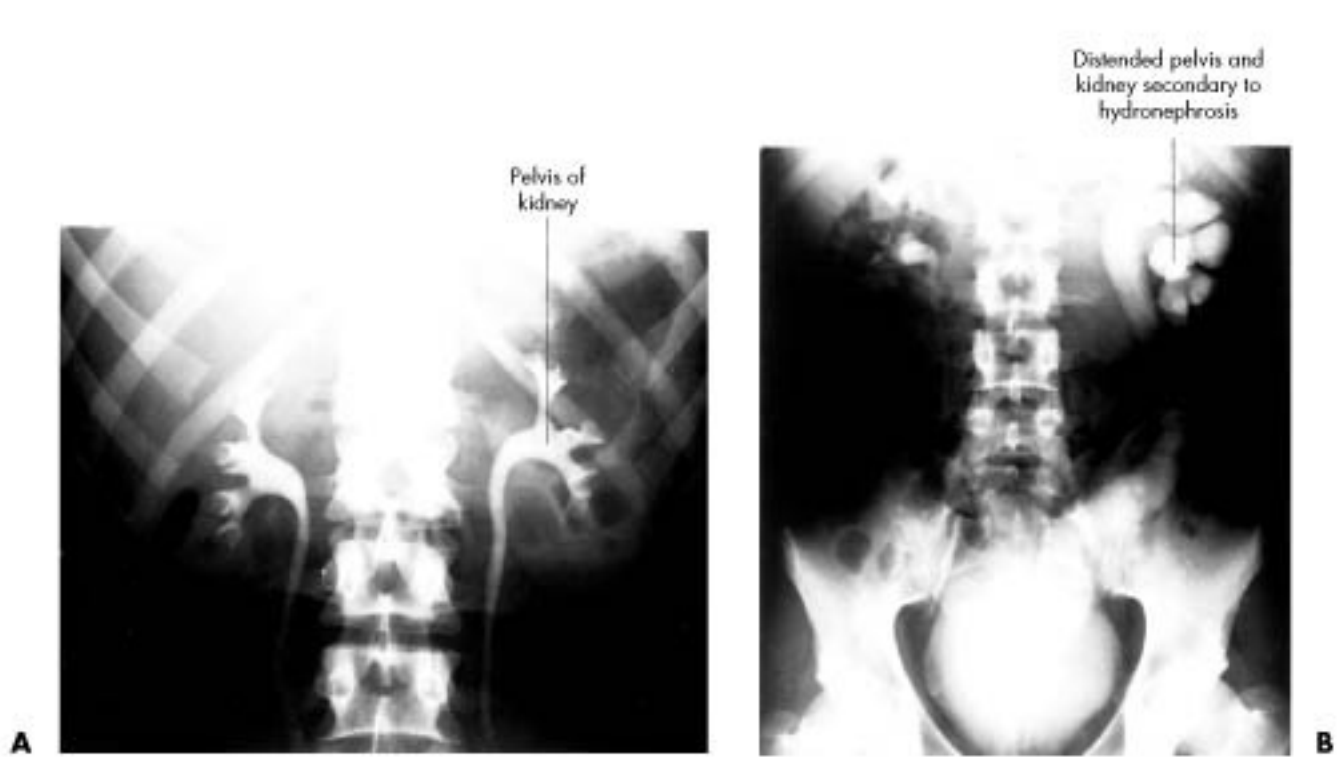
- Causes- intrinsic, extrinsic, functional
- System above level of obstruction is affected
- Location, duration, pressure, urinary stasis, infection affect severity of effects
- Obstruction distal to prostate or bladder neck->mucosal scarring & slower stream
- Obstruction at prostate or bladder neck->tabeculation, diverticuli, incr pres, reflux





**Figure 43-2** Common causes of urinary tract obstruction.

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**Figure 43-3** A, Normal intravenous pyelogram (IVP). B, IVP showing hydronephrosis and hydroureter.

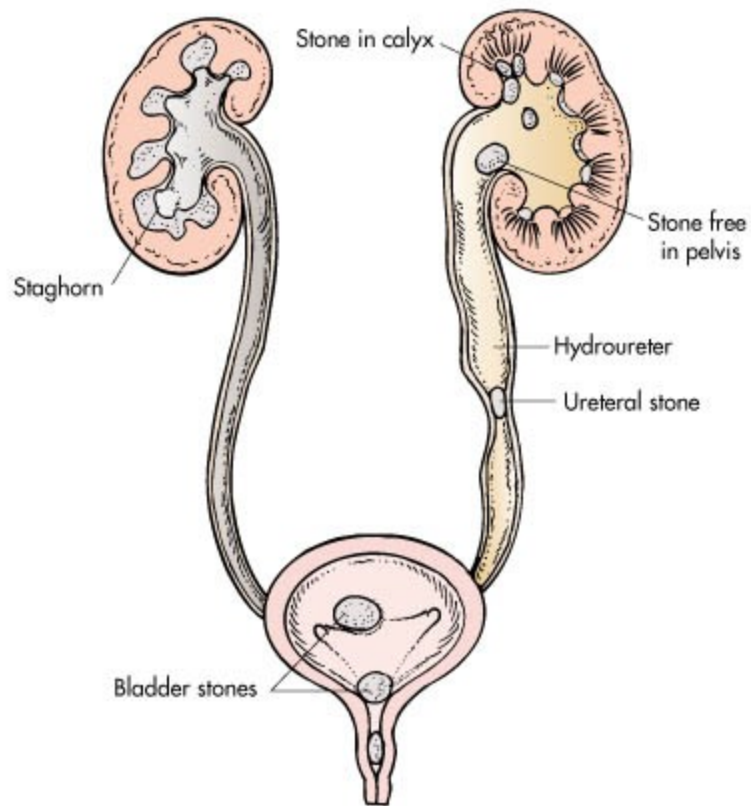
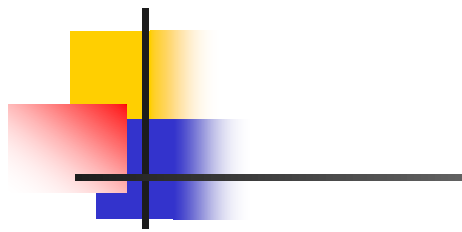
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# Urinary Tract Calculi

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- Stone formation: genetic, metabolic, dietary, climatic, lifestyle, occupational
- Calculus- stone & lithiasis- formation
- Types of stones- see table 46-12
- S/S occur where stone causes obstruction to urine flow; severe abd or flank pain, hematuria, renal colic, n/v, UTI s/s
- Passing stone- intense, colicky pain, mild shock with cool, moist skin



**Figure 43-5** Location of calculi in the urinary tract.

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# Urinary Tract Calculi

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- Dx: history, u/a, C&S, IVP, retrograde pyelogram, ultrasound, cystoscopy, abd x-ray, CT, urine & serum levels of stone metabolites, BUN, Creat, urine ph
- Manage acute attack- treat pain, infection, obstruction
- Eval of composition of stone & prevent further formation of stones



**Figure 43-4** X-ray of a staghorn calculus.

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# Urinary Tract Calculi

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- Indications for endourologic, lithotripsy or surgery
- Cystoscopy
- Cystolitholapaxy
- Cystoscopic lithotripsy
- Ultrasonic, laser or electrohydraulic lithotripsy
- Percutaneous nephrolithotomy



# Nursing Care

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- Prevention- esp pts on BR with urinary stasis, incr fld I minimum 2L/day, diet restrictions purine, oxalate calcium
- See NCP 46-2
- Strain all urine
- Pain management
- Teaching- diet, flds, meds, test urine ph

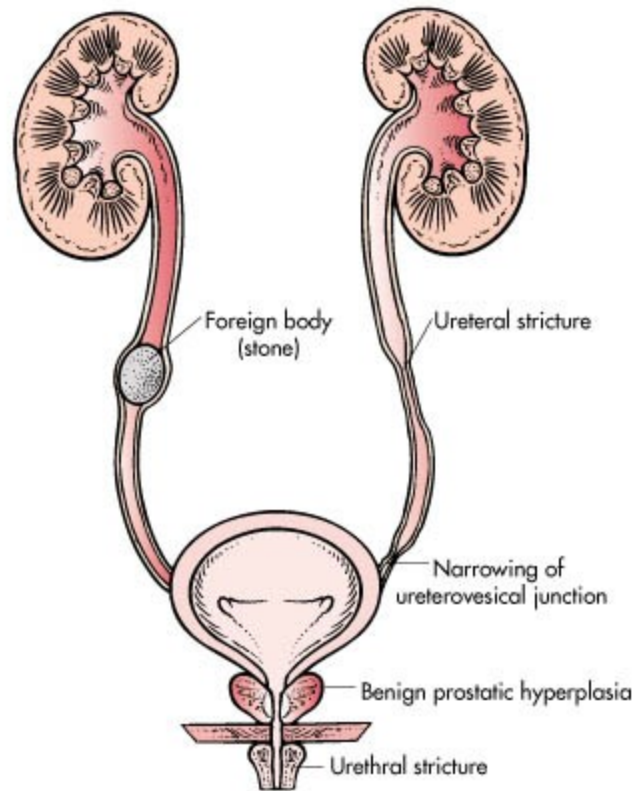




# Strictures

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- Congenital or acquired
- Occur at bladder neck, urethra, ureters
- Causes: trauma, gonorrhoea, urethral instruments, chronic infections, radiation, retroperitoneal abscess
- Treatment : dilatation with catheter, drainage with catheter, surgery



**Figure 43-2** Common causes of urinary tract obstruction.

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# Renal Trauma

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- Blunt trauma common- car accidents, sports, falls with injury to flank, abdomen or back
- Penetrating – gunshots, stabbing
- Dx: history, hematuria, u/a, IVP with cystogram, ultrasound, CT, MRI
- Nsg Care: Monitor I&O, hematuria & nephrotoxic antibiotics, pain, s/s shock



# Nephrosclerosis

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- Sclerosis of small arteries & arterioles-> decr bld flow-> patches of necrosis-> destruction of glomeruli & fibrosis
- Benign nephrosclerosis due to hi BP, & arteriosclerosis
- Accelerated or malignant due to malig hi BP, diastolic >130-> renal insuffic-> renal failure eventually
- Prevention & rx: treat hypertension



# Renal Artery Stenosis

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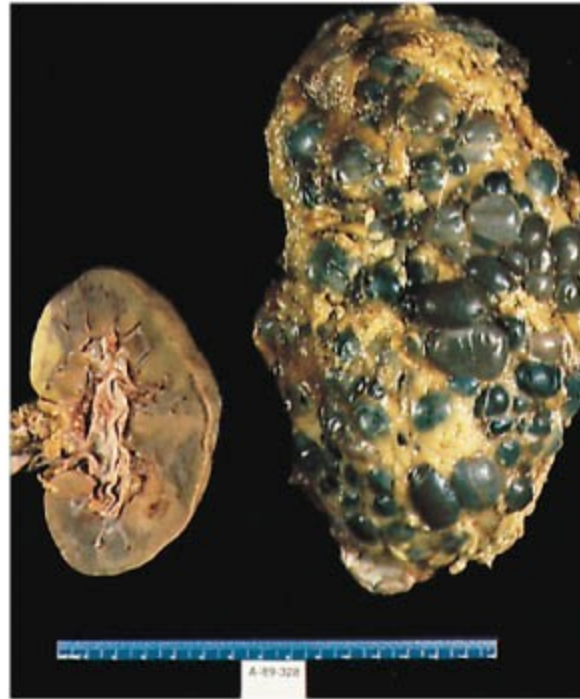
- Partial occlusion renal a. due to atherosclerosis or fibromuscular hyperplasia
- Dx: renal arteriogram
- Rx: control BP, angioplasty, stints, surgical anastomoses bet kidney & splenic artery or aorta



# Polycystic Renal Disease

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- Genetic, latent, s/s appear age 30-40
- Cortex & medulla filled with cysts
- S/S when cysts enlarge- abd or flank pain, palpable enlarged kidneys, UTI, hi BP, hematuria, 50% develop renal fail.
- Dx: H&P, CT, IVP, ultrasound
- Rx: prevent UTI, nephrectomy, genetic counseling



**Figure 43-6** Comparison of polycystic kidney with normal kidney.

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# Medullary Cystic Disease

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- Hereditary
- Recessive form-> renal fail. before 20
- Dominant form-> renal failure after 20
- Affects ability to concentrate urine
- Polyuria, severe anemia, renal failure, metabolic acidosis, poor Na concentration





# Renal Problems in Metabolic & Connective Tissue Diseases

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- Diabetic neuropathy
- Gout
- Amyloidosis
- Systemic Lupus Erythematosus
- Scleroderma



# Renal Tumors

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- Arise from cortex or pelvis, benign or malignant- adenocarcinoma
- Risk factors- smoking, exposure to asbestos, gasoline, cadmium, phenacetin containing analgesics
- S/S: wt loss, anemia, weakness, gross hematuria, flank pain, palpable mass
- Metastasis- lungs, liver, long bones, renal vein & vena cava



# Renal Tumors

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- Dx: IVP with nephrotomography, CT, MRI, angiogram, needle aspiration
- Staging- Robson's system
- Tx: nephrectomy, radiation palliatively, no chemo available, biologic therapy



# Bladder Cancer

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- Most common- transitional cell carcinoma, papillomatous
- Risk factors: smoking, dyes used in rubber & cable industry, phenacetin-containing analgesics, women tx with Cytosin for cervical cancer
- Chronic stones->risk for squamous cell bladder cancer



# Bladder Cancer

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- S/S: gross & painless hematuria, also dysuria, freq, urgency
- Dx: urine for cytology, bladder tumor antigens, IVP, ultrasound, MRI
- Definite dx by cystoscopy & biopsy
- Jewett-Strong-Marshall classification: superficial, invasive, metastatic



# Surgery: Bladder Cancer

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- Transurethral resection with fulgaration
- Laser photocoagulation
- Open loop resection with fulgaration
- Post-op care: increase fld I, I&O, avoid alcohol, analgesics, sitz baths, psychol support, reg follow ups & cystoscopies
- Radical cystectomy



# Tx Bladder Cancer

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- Radiation therapy
- Chemotherapy: Vinblastine, Platinol, Adriamycin, Methotrexate
- Intravesicular therapy: instill chemo into bladder via catheter
- S/E: irritating voiding, hemorrhagic cystitis, decr WBC & platelets



# Urinary Incontinence

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- Stress incontinence
- Urge incontinence
- Overflow incontinence
- Reflux incontinence
- Incontinence after trauma or surgery
- Functional incontinence





# Neurogenic Bladder

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- Bladder dysfunction from CNS neurologic disorder
- Tumors, spinal cord injury, CVA, MS, diabetic neuropathy
- Failure to store, empty or both
- Dysfunction of bladder or urethra
- Location- whether it affects brain or spinal cord



# Causes of Urinary Retention

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- Antihypertensives- Aldomet, Apresoline
- Antiparkinsonian- Levodopa
- Antihistamines
- Anticholinergics- Atropine
- Antispasmodics
- Sedatives & spinal anesthesia
- Urethral obstruction
- Psychological



# Collaborative Care

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- Behavioral techniques
- Pelvic floor electrical stimulation
- Surgery
- Injection of urethral bulking agents
- Meds: muscinic receptor antagonists-  
Ditropan, Pro-bantine, Detrol



# Nursing Care: Urinary Incontinence

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- Stress incontinence- Kegal exercises
- Assess s/s bladder infection, fecal incontinence, bladder distention
- Offer bedpan q2h, usual position to void, privacy, techniques to stimulate urination, bladder training
- Self cath



# Instrumentation

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- Urethral catheters
- Ureteral Catheters
- Suprapubic catheters
- Nephrostomy tubes
- Intermittent catheterization



# Renal & Ureteral Surgery

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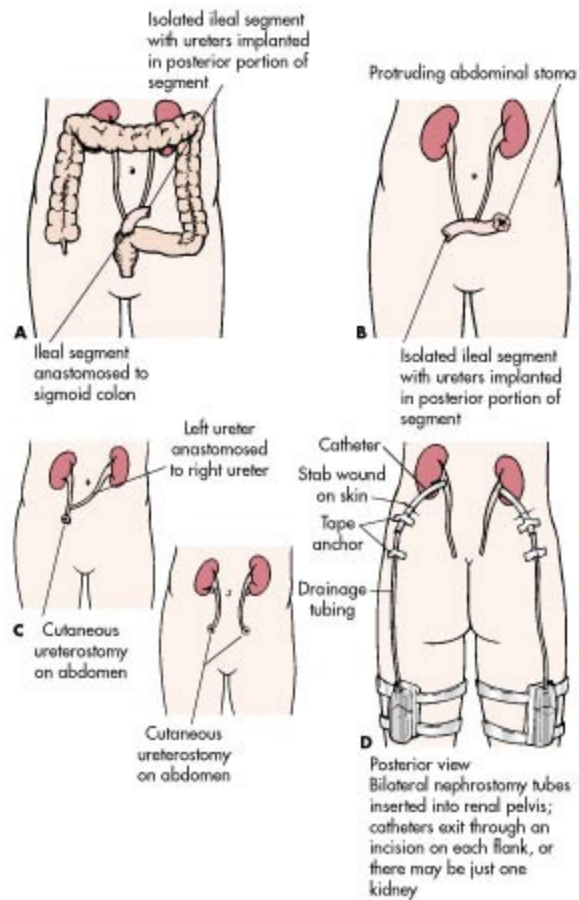
- Post op Care:
- Flank incision, side lying position-> muscle aches post op
- Monitor urine output- 30-50cc/hr
- Monitor resp status
- Medicate for pain
- Monitor for paralytic ileus



# Urinary Diversion

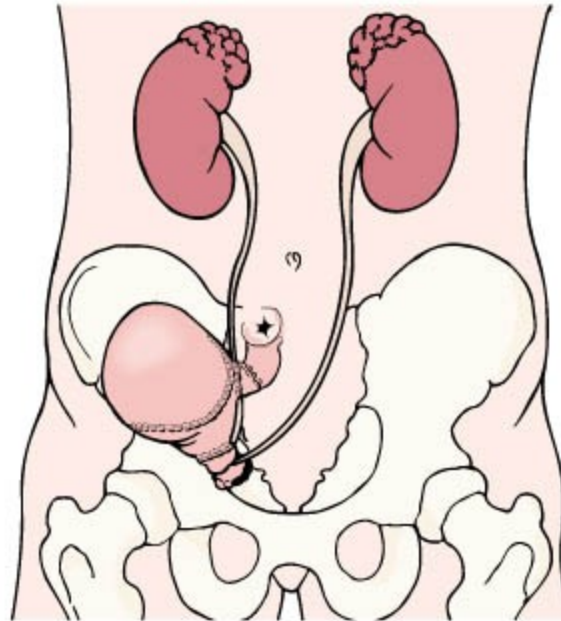
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- Incontinent urinary diversion
- Continent urinary diversion
- Orthotopic bladder substitution
- Pre-op info, assess readiness to learn, involve family, enterostomal nurse
- Post-op complications- shock & atelectasis



**Figure 43-8** Methods of urinary diversion. **A**, Ureteroileosigmoidostomy. **B**, Ileal loop (or ileal conduit). **C**, Ureterostomy (transcutaneous ureterostomy and bilateral cutaneous ureterostomies). **D**, Nephrostomy.





**Figure 43-10** Creation of a Kock pouch with implantation of ureters into one intussuscepted portion of the pouch and creation of a stoma with the other intussuscepted portion.

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# Urinary Diversion

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- Prevent injury to stoma & good skin care important
- Maintain urine output- mucous in urine normal, hi fld intake
- Skin problems- alkaline encrustations with dermatitis, yeast infections, product allergies, sheering excoriations
- Properly fitting appliance



# Urinary Diversion

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- Address pt's concerns- body image, offensive odors, sexual, professional & activity concerns
- Discharge- teach s/s infection & obstruction, care of ostomy
- Fitted with appliance 7-10 days post-op & may need to later be refitted
- Info where to buy supplies, emer phone #, ostomy clubs, MD follow up