

# GU applications to primary care practice



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# Top 10 referrals to Urology from primary care

- UTI's
- Urinary incontinence
- Stone Disease
- Hematuria
- Erectile Dysfunction



# Top 10 referrals to Urology from primary care

- Scrotal pain
- GU emergencies
- BPH
- Prostatitis
- GU Cancers




# Physical Examination

- Kidney
- Bladder
- Pelvic Examination
- Digital Rectal Examination
- Scrotal Examination
- Penis



## Symptoms: Pain

- Obstruction: intermittent, dull to sharp, nausea
- Inflammation: constant, mild to severe intensity
- Referred: ureteral; bladder; prostate; testicle, epididymis



# **Female Urinary Tract Infections**



# Urinary Tract Infections (UTIs)

- Definition: 100,000 CFU/cc urine vs. 10<sub>6</sub> CFU/cc urine (detects 30-50% ↑ female UTIs)
- Lifetime incidence in women = 50%
- UTIs account for 7 million o.v. annually
- Bacteriuria ↑ w/ age: ages 65-70 15-20% females; 0-3% men; over age 80, 20-50% women; 20% men



# Categories of UTIs

- **Uncomplicated UTI:** < 2 UTIs/yr, respond to antibiotics, w/o structural abnormalities or pyelonephritis
- **Complicated UTI:** >2 UTIs/yr./ persistent UTIs, pregnancy, DM, renal transplant, immunosuppression, elderly patients w/ UTIs



# Etiology of UTIs

- Interaction between host and pathogen
  - Uncomplicated UTIs: pathogen virulence most important
  - Complicated UTIs: host factors most important

Nickel, JC: Practical Management of Recurrent Urinary Tract Infections in Premenopausal Women. *Reviews in Urology* 2005; 7(1): 11-17.



# Microbiology

- *E-coli* most common
- Coagulase-negative *staphylococci*
- Group B streptococci,
- enterococci



# Host Defenses against UTIs

- Normal vaginal flora (*Lactobacillus*) compete with bacteria, maintain acidic pH
- Vaginal fluid (secretory IgA) inhibit bacterial adhesion
- Bladder defenses:
  - mechanical clearance
  - acidic urine, urine salts and lactoferrin
  - Tamm-Horsfall mucoprotein inhibits bacterial adherence
  - antibodies, cytokines, polymorphonuclear cells
  - exfoliation of infected cells



# Natural History of UTIs

- Lifetime Incidence in women = 50%
- 80% with prior UTI recur w/i 18 mo.
- 75% of recurrences are due to a different organism
- Average recurrence is 1.6-2.6 infections/yr.

Nickel, JC: Practical Management of Recurrent Urinary Tract Infections in Premenopausal Women. *Reviews in Urology* 2005; 7(1): 11-17.



# Prevalence of UTIs

- Young girls  $\leq 1\%$
- Premenopausal women 5%
- Pregnant women 2 – 7%
- Diabetic women 8-14%
- Community-dwelling women  $>80$  yr, 20%
- Elderly in nursing homes, 15-50%
- Patients with spinal cord injury  $> 50\%$
- Hemodialysis patients, 28%



## Risk Factors for Recurrent UTIs

- Premenopausal: *sexual activity*, hx. UTI as a child, maternal hx. of UTI
- Menopausal: *low vaginal estrogen*, hx. premenopausal UTI, non-secretor blood type, pelvic floor abnormalities
- Elderly: *catheterization, urinary incontinence, antibiotic exposure*, impaired mental status

Kreiger, JN: Urinary Tract Infections: What's New? *J. Urol* 2002; 168: 2351-2358



# UTIs: Evaluation

- History
  - Urgent, frequent, malodorous urination
  - Rule out other conditions that cause UTI-like symptoms:
    - interstitial cystitis, bladder cancer, detrusor instability
    - Bladder irritants: caffeine, spicy foods
    - Stress
    - Stone disease
    - Hormonal imbalance: atrophic vaginitis
    - Medications (diuretics)
- Physical Examination



# UTIs: Evaluation

- **Laboratory tests**
  - U/A, urine culture; “dirty specimen” epithelial cells, (sterile pyuria, R/O chlamydia, stone, TB)
  - Pyuria- 80-90% sensitivity, 50-76% specificity for UTI  
Dip stick tests Leukocyte esterase: only detects the presence of WBCs → 50% positive predictive value, 92% negative predictive value
  - Nitrite (Greiss) test: highly specific for UTIs. Bacteria convert nitrate to nitrite in the urine. Sensitivity 66% 1<sup>st</sup> test; 80% 2<sup>nd</sup> test; 90% 3<sup>rd</sup> test; first morning specimen is best
- **Imaging Studies:** renal US, CT scan abdomen and pelvis, IVP, VCUG

Engel, JD, Schaeffer, AJ: Evaluation of and antimicrobial therapy for recurrent UTIs in women.  
*Urologic Clinics of North America*; 25(4): 685-701, 1998

# Radiation Exposure Risk

- Sievert measures biological equivalent, which depends on the type of radiation, tissue being treated, time and volume. 1 Sv equals 1 joule per kilogram. 1 Sv = 1000 mSv; Gray (gY) measures absorbed dose. One gY = 100 rad.
- International Commission on Radiation Protection: < 20 mSv/yr during 5 yr.; < 50 mSv in any single year to \_ risk 2° malignancies
- Radiation exposure:
  - Background radiation: 2.4 mSv/yr
  - 2-view KUB: 1.7 mSv
  - IVP: 2.5 mSv
  - Abd or pelvic CT: 10 mSv
  - ABD and pelvic CT: 20mSv
  - CXR: 20 mSv
  - Renal US, MRI: 0 mSv
- Sensitivity/negative predictive value for locating clinically significant stones: Renal US + KUB: 77-79%/46-68% vs CT scan 92-93%/71-86%



# UTIs: Treatment

- Choice of antibiotics and duration of therapy: uncomplicated vs. complicated UTI
  - Standard therapy (single dose/3-day/7-10 day)
  - Patient-directed therapy
  - Antibiotic suppression
  - Post-coital prophylaxis
  - Switch therapy

Kunin, CM. *Urinary Tract infections*, Philadelphia, Williams & Wilkins, 5<sup>th</sup> ed, 1997.

Kreiger, JN: Urinary Tract Infections: What's New? *J. Urol* 2002; 168: 2351-2358



## Standard Therapy for UTIs

- Single-dose vs. 3-day vs. 7-10 day therapy
  - **3-day therapy:** Fewer recurrences than single-dose therapy, equal efficacy with 7-10 day therapy\_

\_Kreiger, JN: Urinary Tract Infections: What's New? *J. Urol* 2002; 168: 2351-2358



# Patient-directed Therapy\_

- Requirements: Initial episode:
  - require a U/A and urine C & S (helps avoid misdiagnosis, which can lead to delayed treatment of other causes of UTI-like symptoms)
  - document resolution of UTI signs and symptoms with a 3-day course of antibiotics
- 3-day course of Septra if community resistance pattern is < 20%, otherwise use a fluoroquinolone.
- Results: 92% clinical cure, 96% culture-proven cure

\_Gupta, K, et al: Patient-initiated treatment of uncomplicated recurrent urinary tract infections in young women. *Ann Intern Med* 2001; 135: 9-16



# Patient-directed Therapy\_

- Accuracy of UTI self-diagnosis
  - 84% had culture proven UTI
  - 11% had bacteriuria or pyuria
  - Only 5% were normal

\_Gupta, K, et al: Patient-initiated treatment of uncomplicated recurrent urinary tract infections in young women. *Ann Intern Med* 2001; 135: 9-16



# Post-Coital UTI Prophylaxis

- Useful when UTIs are related to sexual intercourse
- Take a single dose of antibiotics immediately after sex
- Incidence was 0.3 episodes/yr. for post-coital antibiotics vs. 3.6 episodes/yr for placebo\_
- Doesn't lower the incidence of long-term recurrence
- Antibiotic therapy may increase risk of unwanted pregnancy in women taking birth control pills.

\_Stapleton, A, et al: Post-coital antimicrobial prophylaxis for recurrent urinary tract infections: a randomized double-blind placebo controlled trial. *JAMA* 1990; 264: 703-706



# Antibiotics and oral contraceptive medication

- Few controlled studies, no RCTs.
- A small decrease in efficacy may occur in the "low-dose" (<35 g of estrogen) combination OCPs.
- Obstetrics & Gynecology 2001;98:853-860, 2001: 167 articles were retrieved for analysis. Another 32 articles were identified by review of the references cited in these publications.
  - Rifampin impairs the effectiveness of OCs.
  - Pharmacokinetic studies of other antibiotics have not shown any systematic interaction between antibiotics and OC steroids.
  - *However, individual patients do show large decreases in the plasma concentrations of ethinyl estradiol when they take certain other antibiotics, notably tetracycline and penicillin derivatives.*
- All women using combined oral contraceptives should be informed of the very low level of risk of interactions with antimicrobials (probably about 1%) and that it is not possible to identify who may be at risk.

<http://answers.google.com/answers/threadview/id/710498.html>; access 3/21/2009



# Antibiotic Suppressive Therapy

- Helpful for ‘ *cluster* UTIs’ (> 4 UTIs/yr)
- Use \_ normal dose of antibiotics, either daily or Monday-Wednesday-Friday schedule.
- Decreases incidence by 95% during therapy
- **Does not** decrease long-term recurrence rate

Nickel, JC: Practical Management of Recurrent Urinary Tract Infections in Premenopausal Women. *Reviews in Urology* 2005; 7(1): 11-17.

\_Kreiger, JN: Urinary Tract Infections: What’s New? *J. Urol* 2002; 168: 2351-2358



# Acute Pyelonephritis

- Signs/symptoms: fever, chills, CVA tenderness, cystitis
- *e.coli* most common organism (80%)
- Imaging study if Dx in doubt, hx. Stone, GU abn., not responding after 72hr. CT scan (nl. 75%), renal US and KUB
- Non-toxic, quinilone x 14 d; toxic, high risk (e.g., pregnancy, obstruction) admit, switch therapy
- Emphysematous pyelo (gas producing org., *e.coli* > *Klebsiella*, *Proteus*) : emergency; 11-54% mortality, usually DM; drainage, antibiotics



# Chronic Pyelonephritis

- Often asymptomatic
- Etiology: repeated infections, esp. with urinary reflux during childhood \_scarring, atrophy, renal insufficiency
- Recurrent UTIs
- Imaging studies: renal US, CT scan
- Rx: expectant/antibiotics/surgery



# Switch Therapy

## **Acute uncomplicated pyelonephritis**

- Initial single dose of a 3<sup>rd</sup> generation cephalosporin or single-dose gentamicin (5/mg/kg)
- Followed by a ‘Switch’ to oral fluoroquinolone for 14 days
- Levaquin 750 mg x 5 days can be used

Kreiger, JN: Urinary Tract Infections: What’s New? *J. Urol* 2002; 168: 2351-2358



# When not to treat a UTI

- Asymptomatic bacteriuria: school age children, elderly patients, spinal cord patients, patients with indwelling catheters
  - Untreated patients have a *lower* incidence of pyelonephritis
  - Treatment increases antibiotic resistance

Kreiger, JN: Urinary Tract Infections: What's New? *J. Urol* 2002; 168: 2351-2358



## When to treat Asymptomatic UTIs

- Pregnant women (increased risk for pyelo)
- Patients undergoing urologic procedures
- Short term indwelling catheter (start day before and day of catheter removal). *UTIs in 0% treated vs. 17% not treated.*



# Evidence-based UTI Prevention Strategies

- Sexually active females: avoid spermicidal compounds (diaphragms, condoms)\_
- Cranberry juice
  - A RDBC study of 150 women over a 12-month period found that cranberry juice and cranberry extract tablets significantly decreased the number of patients having at least one symptomatic UTI per year. Dosage: one tablet of concentrated cranberry extract (300 to 400 mg) twice daily, or 8 oz of pure *unsweetened* cranberry juice three times daily. Cost \$10 -15 for a 30 day supply\_

\_ Scholes, D. et al: Risk factors for recurrent urinary tract infections in young women. *J Infect Dis*, 2000; 182: 595.

\_ Stothers L. A randomized trial to evaluate effectiveness and cost effectiveness of naturopathic cranberry products as prophylaxis against urinary tract infection in women. *Can J Urol* 2002;9:1558-62; <http://www.aafp.org/afp/20041201/2175.html>



# Probiotics

- *Lactobacillus acidophilus* -the kind found in yogurt, *Lactobacillus casei*, and *Bifidobacterium longum*) during and after a course of antibiotic therapy can prevent bothersome intestinal problems.
- Take one capsule containing 1-5 billion organisms/capsule b.i.d. with food

Murray MT, Pizzorno JE (1999) Probiotics. In: L Pizzorno JE, Jr., Murray MT (eds) Textbook of Natural Medicine, 2<sup>nd</sup> ed. Churchill Livingstone, Edinburgh, London, New York, Philadelphia, Sydney, Toronto, pp 893-898



# Urinary Incontinence

# UROLOGY



**“Urology department. Can you hold?”**



# Urinary Incontinence (UI)

- Involuntary loss of urine
- 4.5-53% prevalence in females
- 1.6-24% prevalence in males

Blavivas, J. Grantz, A. (2000) Urinary incontinence: Pathophysiology, evaluation and management overview in Walsh, PC ed, Campbell's Urology 8<sup>th</sup> ed. Philadelphia, WB Saunders 1027-1052



# UI: Types

- Urge
- Stress
- Overflow
- Enuresis
- Giggle



## UI: Evaluation

- History: triggers, severity, coping mechanisms
- Bladder diary
- Physical exam (pelvic organ prolapse, atrophic vaginitis)
- Pad test
- Urodynamic testing



## Urgency: UI

- Eliminate bladder irritants, esp. caffeine
- Treat underlying condition: Reduce *Stress*
- Bladder training exercises: Pelvic floor exercises; time voiding, “Freeze and Squeeze”
- Medications (hormones, anti-muscarinic)



# OAB Medications

- Mechanism of action: competitive muscarinic receptor antagonist, selective for M3 receptor, found in bladder, salivary gland, gastrointestinal smooth muscle, iris
  - Increased volume threshold and decreased frequency of unstable detrusor contractions
- Options: generic oxybutynin, delayed-release preparations; can take 4 weeks or longer to see peak effect
- Side Effects: Dry mouth, blurry vision, constipation
- Precautions: Myasthenia Gravis, gastric emptying disorders, ulcerative colitis, severe constipation, narrow angle glaucoma, hepatic dysfunction, significant bladder outlet obstruction



## Safety of Topical Estrogens

- Estrogen deficiency can cause atrophic vaginitis, dyspareunia, UTIs, urinary incontinence
- VagiFem tablets (**10mcg**) daily x 2 wk and then 2 x week, 5pmol baseline\_72 pmol/l at 2 wk \_16 pmol/l at 4 wk (vag epithelium thickening \_absorption
- EString® 5-10mcg/day, ring lasts 3 months

<http://theoncologist.alphamedpress.org/cgi/content/full/13/3/222> accessed 3/21/2009.



# Overflow Incontinence

- Treat the underlying condition:  
Urodynamic study will evaluate detrusor function. If detrusor  $> 20\text{cm H}_2\text{O}$  \_ TURP
- Self-catheterization: maintain bladder volume 600cc or less per catheterization
- Foley catheterization
- Medications (bethanecol,  $\alpha$ -blockers)



## Female Stress UI

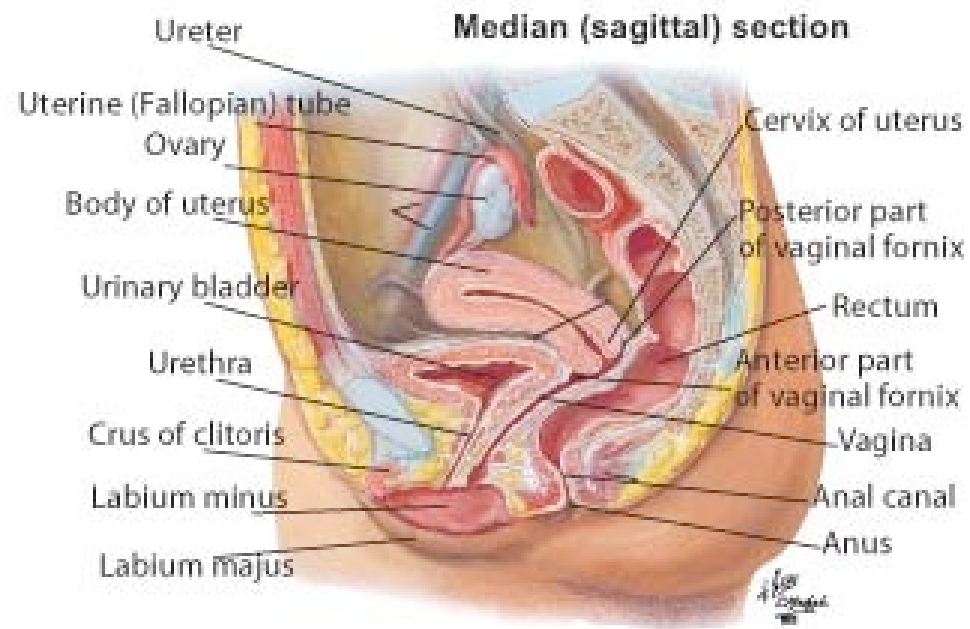
- Type I USI: hx. urinary leakage, but it can't be demonstrated w/ testing
- Type II USI: urethral hypermobility. Most common type.
- Type III: Intrinsic sphincter deficiency.



## Female Stress UI

- Most stress incontinence is a combination of hypermobility and intrinsic sphincter deficiency.
- Loss of urethral support due to loss of collagen, stretching of urethral ligaments due to childbirth, obesity, activity
- Intrinsic sphincter is a combination of urethral mucosal seal and inherent factors including collagen, fibroelastic tissue, smooth and striated musculature. Lost secondary to surgical scarring, radiation, hormonal, senile changes.

# Female Pelvis





# Female Stress UI

- Treat the underlying condition
  - Behavioral therapies: biofeedback w/w/o electrical stimulation improves continence in 50% patients w/ mild symptoms
  - Medications: pseudoephedrine, topical estrogen
  - Surgery



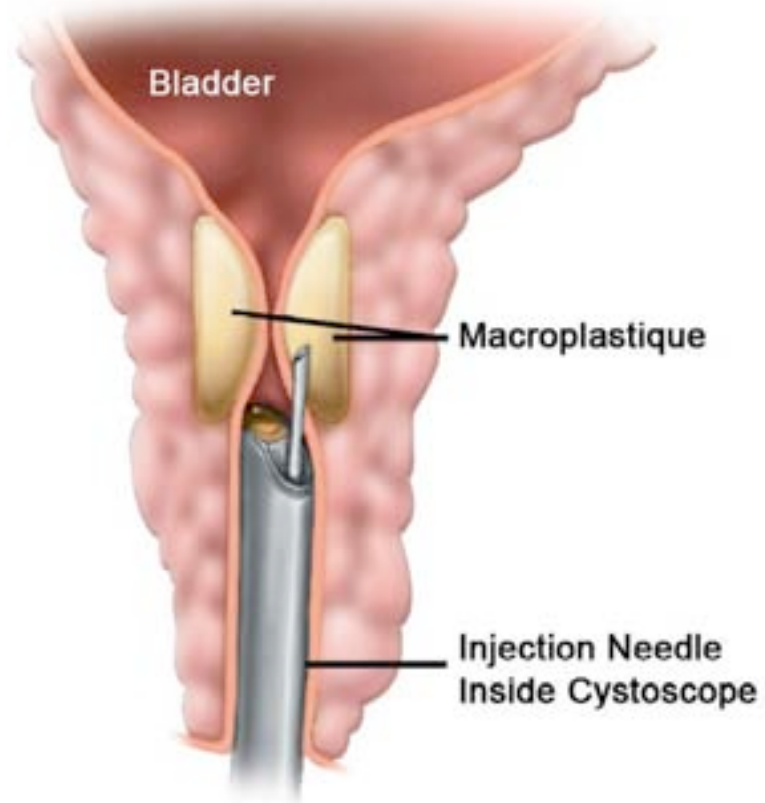
## Female Stress UI

- Surgery: Midurethral tension free sling with polypropylene mesh: 85% cure, 10% improvement at 12 months. Treatment for type II and type III USI
- Submucosal urethral bulking agent: macropastique (absorbable water-soluble gel and permanent silicone elastomer) 38-65% cure. May repeat in 12 weeks.

# Mid Urethral Sling



# Macroplastique





# Stone Disease



# Stone Disease

- Incidence as high as 12% of population; M/F parity, due to  $\Delta$  in \_obesity, lifestyle, diet
- 3-4 x more common in whites than blacks
- 50% recurrence rate within 5 years, 80% lifetime
- Peak incidence 4-6<sup>th</sup> decade
- Calcium oxalate (70%) Calcium Phosphate (10%) uric acid (10%) struvite (5%) cystine (1-5%)



# Stone Disease: Signs/Symptoms

- Renal / Ureteral colic
- N/V
- Radiating pain
- Voiding symptoms
- Hematuria (90%)



# Stone Disease: Pathophysiology

- Low urine volume \_supersaturation of urine with crystals of calcium, oxalate, uric acid, etc.
- ✓ ↓ stone inhibitors (Mg, citrate)
- ✓ Diet (salt, sugar, protein, oxalate)
- ✓ Genetics (RTA, cystinuria- 25%family hx)



# Stone Disease: Pathophysiology

- ✓ UTI (proteus, klebsiella, pseudomonas)
- ✓ Medications (HIV meds, laxatives [NH<sub>4</sub>PO<sub>4</sub> stones] cough syrup with guafenisin)
- ✓ Diseases (hyperparathyroidism)
- ✓ Occupation (dehydration, sun exposure)



# Stone Disease: Pathophysiology

**Hypercalcuria-** most common metabolic abnormality.

## *Types*

- ✓ *Absorptive* from intestinal tract, primary defect
- ✓ *Renal leak* ( \_absorption in distal tubule \_ incr. PTH, vitD \_incr. Ca<sup>+</sup> absorption from gut and bone)
- ✓ *Resorptive* (hyperparathyroidism)

Urinary Ca<sup>+</sup> elevated in all three types. Serum Ca<sup>+</sup> is normal in absorptive and renal leak, elevated in resorptive hypercalcuria.



# Stone Disease: Pathophysiology

## Obesity

- ✓ Insulin resistance \_ impaired ammonia excretion \_ lower urine pH  
\_hyperuricosuria, hypercalcuria \_ decreased urinary citrate, Mg<sup>+</sup>



# Stone Disease: Pathophysiology

## Dietary Sodium

- ✓ Exerts same effect as renal leak of  $\text{Ca}^+$
- ✓ Causes secondary hyperparathyroidism, incr. vitD synthesis and incr. intestinal  $\text{Ca}^+$  absorption
- ✓ Every 100mEq/d of  $\text{Na}^+$  increases  $\text{Ca}^+$  excretion by 50mg/dL

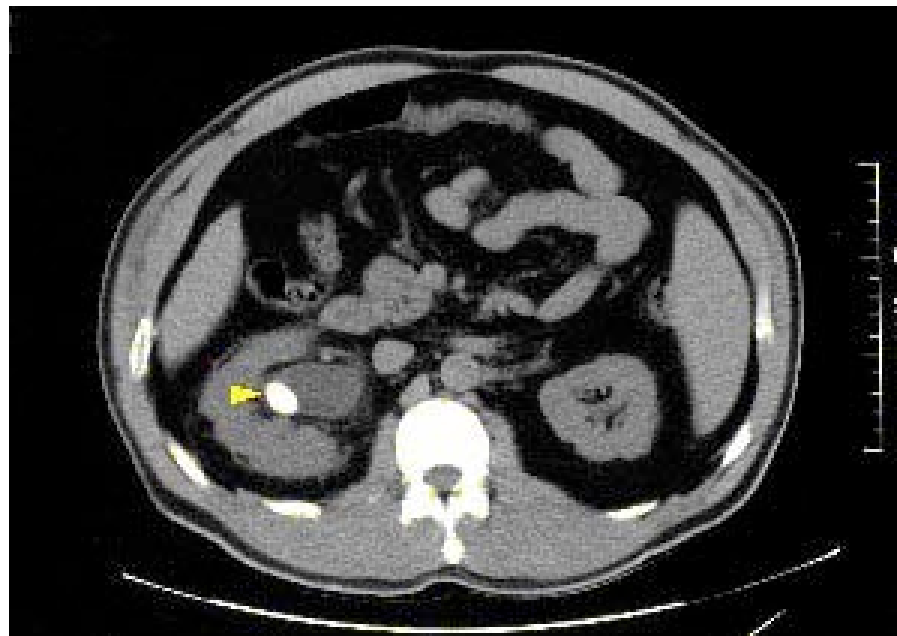


# Stone Disease: Evaluation

- CT scan- kidney stone protocol
- IVP, CT Urogram
- Renal U/S
- KUB
- Metabolic work-up

# CT Scan Kidney Stone Protocol

Kidney stone



# CT Scan Kidney Stone Protocol

ureteral calculus (red arrow)

phlebolith (yellow arrow)

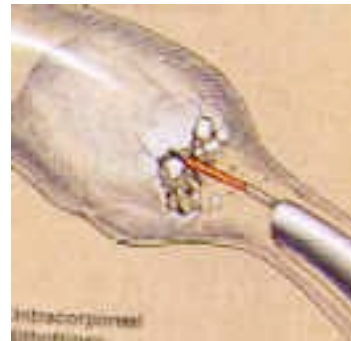




# Stone Disease: Treatment

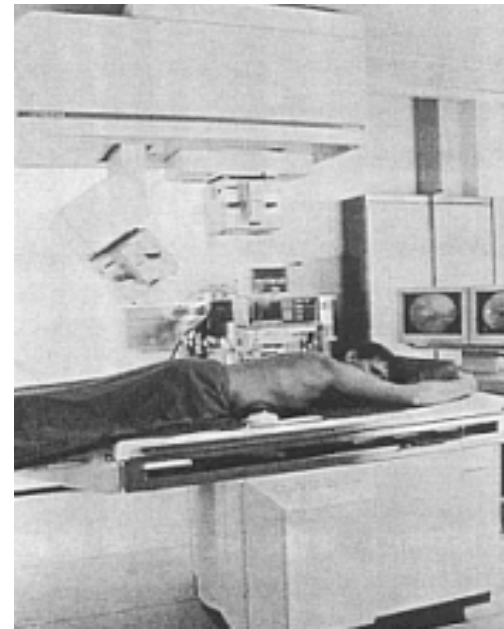
- Emergency: Intractable pain, solitary kidney, sepsis, renal insufficiency
- Medications: Ibuprophen, flomax (if not contraindicated)
- Likelihood of stone passage
  - 90% < 4mm will pass
  - ✓ 50% 4-6 mm will pass
  - ✓ 20% > 6mm will pass
- Surgery (lithotripsy, ureteroscopy)

# Stone Disease: Surgery



# Stone Disease: Surgery

## Shockwave Lithotripsy





# Stone Disease: Natural prevention

- ✓ ↑ fluid intake (maintain a clear urine color)
- ✓ ↓ red meat consumption
- ✓ ↓ oxalate (spinach, tea, chocolate, nuts)
- ✓ ↓ dietary sodium
- ✓ Normal Ca<sup>+</sup> diet, moderate restriction in Pts with documented absorptive hypercalcuria




# Stone Disease: Natural prevention

Calcium supplementation: use Calcium Citrate  
(800mg/day is generally safe\*)

- ✓ Premenopause: initial \_ urinary  $\text{Ca}^+$  first month of supplementation; less as supplementation continues, PTH secretion is suppressed and VitD down regulates
- ✓ Postmenopause: blunted VitD absorption, absorption of  $\text{Ca}^+$  decreases

*\*High-risk patients can be managed by performing a baseline metabolic workup before starting supplementation and again 3 months later*



# Stone Disease: Prevention/medications

- Hypercalcemia (thiazide)
- Hyperoxaluria (calcium, orthophosphate, vitamin B6, potassium, magnesium)
- Hypocitricuria (urocit-K)
- Hyperuricosuria (Urocit-K, allopurinol)
- Cystinuria (thiola)

Dretler, S. (1998) The physiologic approach to the medical management of stone disease

*Urologic Clinics of North America* 25 (4) 613-623



# Hematuria



# Hematuria

Clinical Guidelines:

[www.AUAnet.org/guidelines](http://www.AUAnet.org/guidelines).

Grossfeld, Gary D, Wolf, Stuart J, Litwin, Mark S, et al, Asymptomatic Microscopic Hematuria in Adults: Summary of the AUA Best Practice Policy Recommendations, *Am Fam Physician*, 2001, 63: 1145-54.



# Hematuria

- Definition: *microscopic* ( $\geq 3$  RBCs/HPF on 2 or 3 U/A). *gross* – visible blood in urine.
- + dip analysis 65-95% specific for 2-5 RBC/HPF) should be confirmed with a microscopic U/A
- Cancer 5% w/ microscopic; 20-40% w/ gross hematuria.
- Prevalence: 0.2-21% depending upon population
- Etiology: neoplasms, inflammation, congenital diseases (PCKD, Familial hematuria, sickle cell, medullary sponge kidney), trauma, metabolic, medications
- Hematuria 2<sup>o</sup> to anticoagulation: 50% GU pathology



# Hematuria: High-Risk Patients

- Smoking History
- Occupational exposure to benzene or aromatic amines
- History of gross hematuria
- Age > 40 years
- History of urologic disorder or disease
- History of irritative voiding symptoms
- History of UTI
- Analgesic abuse
- History of pelvic irradiation



# Hematuria: Evaluation

- History- signs and symptoms, prior episode, family history, smoking history, kidney stone hx.
- Eliminate causes for 'benign' hematuria (menstruation, vigorous exercise, sexual activity, trauma) by repeating U/A 48 hrs. after cessation of activity
- Physical examination
- U/A – dip stick/microscopic examination
- Urine cytology
- Imaging studies: IVU, renal US, CT scan
- Cystoscopy



# Hematuria: Treatment

- Treat underlying cause
- Etiology of asymptomatic microscopic hematuria determined in 32-100% of cases
- Follow-up after a negative evaluation is controversial. Consider checking U/A, voided urine cytology, BP at 6, 12, 24, 36 months, esp. in high-risk patients
- Repeat workup for abnormal cytology, gross hematuria, irritative voiding symptoms in absence of infection



# Hematuria: Reason to Refer

- Persistent or symptomatic hematuria
- Hematuria in high-risk patients
- Nephrology referral in pts. with RBC casts, proteinuria  $> 0.5 - 1$  gm/24 hr, elevated serum creatinine, urine cytology with greater than 50% dysmorphic RBCs, patient request



# Erectile Dysfunction



## E.D.

- Definition: inability to achieve and maintain an erection satisfactory for intercourse
- Affects 30 million men: 50% of men ages 40-70 experience some degree of E.D. – 17% minimal, 25% moderate, 10% complete, 48% of all degrees

Feldman, HA, et.al.: Impotence and its medical psychosocial correlates: Results of the Massachusetts male aging study. *Journal of Urology*; 151: 54-61, 1994



## ED: Etiology

- 90% organic: veno-occlusive, arterial (ASCVD risk factor in 70% men >60 y.o., hormonal (6%))
- Medication: esp. HT and psychotropic meds
- Disease-related: DM, HT, Hyperlipidemia cause endothelial dysfunction
- Lifestyle: smoking, lack of exercise

Chun, J, Carson, CC: Physician-patient dialogue and clinical evaluation of erectile dysfunction. *Urologic Clinics of North America*; 28(2): 249-258, 2001



# ED: Evaluation

- Establish rapport first
- History: onset, medications, nocturnal erection, setting, duration, etc.
- Validated questionnaire: Sexual Health Inventory for Men (SHIM)
- Differentiate problem of sexual desire, ejaculation, erection

Lewis, JH: The role of the Nurse Practitioner in the diagnosis and management of erectile dysfunction. *The Nurse Practitioner*; 25(6)S: 13-18, 2000



# SHIM

- Five questions regarding sexual health over the past 6 months with 5 possible scores for each of the following areas: confidence in getting an erection, firmness of erection, maintain erection during penetration, maintain erection until completion, overall satisfaction
- Severe ED, 1-7; moderate ED, 8-11; mild-moderate ED, 12-16; mild ED, 17-21; no ED, 22-25.



# ED: Physical Examination

- Pulses, body habitus, thyroid, secondary sexual characteristics, neurosensory
- Testicular size
- Penile plaque

Chun, J, Carson, CC: Physician-patient dialogue and clinical evaluation of erectile dysfunction. *Urologic Clinics of North America*; 28(2): 249-258, 2001



## ED: Tests

- Total + % free testosterone (early AM)
- LH, Prolactin if hypogonadism is present
- Thyroid function studies
- FBS, lipid panel
- Nocturnal penile tumescence testing
- Penile injection with vasoactive medication

Chun, J, Carson, CC: Physician-patient dialogue and clinical evaluation of erectile dysfunction.

*Urologic Clinics of North America*; 28(2): 249-258, 2001



# ED: Treatment

- *Goal directed treatment*
- Medications
- Vacuum tumescence device
- Surgery
- Sexual counseling



# ED: Medical Therapy

- Muse-urethral alprostadil (PGE1)
- Penile
- : PGE1 (Edex brand)
- Trimix (PGE1, papaverine, phentolamine)
- 5-Phosphodiesterase inhibitors (Viagra, Levitra, Cialis)
- Testosterone replacement

Lewis, J.H. Albaugh, J. (2000) Insights into the management of erectile dysfunction Part 11:

*Urologic Nursing 20 (1) 22-29*



# ED: Treatment

- Sildenafil Citrate (Viagra)
  - Dosage: 25-50-100 mg
    - Take on an empty stomach, 1 hour before sex, absorption time 1 hour
    - Requires sexual stimulation
    - T-max 30-120 minutes \_ life 3-5 hours
  - Side effects: flushing, headache, visual (blue), dyspepsia, nasal stuffiness, blindness
  - Don't take w/i 4 hours of an alpha-blocker

Padma-Nathan, H. Guiliano, F. (2001)

Oral therapy for erectile dysfunction *Urologic Clinics of North America* 28 (2) 321-324



# ED: Treatment

- Sildenafil Citrate (Viagra)
  - Non-arteritic anterior ischemic optic neuropathy NAION
    - No reported cases in 103 clinical trials involving 13,000 patients treated with Sildenafil
    - NAION affects 1000 to 6000 Americans yearly
    - DM, HT, aging associated with risk for NAION

Accessed 3/25/2006: <http://www.washingtonpost.com/wp-dyn/content/article/2005/05/27/AR2005052700456.html>



## ED: Treatment

- Vardenafil (Levitra)
  - Dosage: 5, 10, 20 mg.
  - Faster onset than Viagra (absorption time 0.8 hour), starts working within 15 minutes
  - In patients that are *stable* on  $\alpha$ -blockers, start with lowest dose of Levitra
  - ✓ Same side effect profile as Viagra



# ED: Treatment

## ■ Tadalafil (Cialis)

- Dosage: 2.5, 5 mg (daily dosing), 10, 20 mg.
- Take 1 hour before sex
- Half life 17.5 hrs, effect can last 36 hours
- Can be taken with food
- Use lower dose with renal or hepatic insufficiency
- Can use with the lowest dose of Tamsulosin (0.4mg)

## ■ Side Effects: similar profile to Viagra but less flushing, myalgia 3-6%



## ED: PDE-5 inhibitors

- Never use with nitrates
- Do not increase risk for MI or death
- Safe for patients taking multiple BP meds
- Can be used after angioplasty or CABG when cardiologist clears patient for sexual activity
- In cardiac emergencies, nitrates can be adm. 24 hrs. after sildenafil and vardenafil and 48 hrs. after tadalafil.



## ED: PDE-5 inhibitors

- Use same drug at least 5 times before switching
- OK to try all three drugs before making final selection
- Androgen replacement therapy may improve efficacy in men with hypogonadism



# Natural Treatments for ED

- Lifestyle (exercise)\_
- Education (*Beyond Viagra* handout available on the Associated Urologists of North Carolina website: [www.auncurology.com](http://www.auncurology.com))
- Supplements
  - L-arginine 1000 mg t.i.d. between meals;
  - Korean Ginseng

\_Derby, CA, et al: Modifiable risk factors and erectile dysfunction: Can life-style changes modify risk? *J Urol*, 2000; 56: 302.



# ED: Treatment

## ■ Andropause

- Signs: ↓ testicular size, ↓ muscle mass, osteopenia, visceral obesity, ED: 6%
- ✓ Symptoms: fatigue, depression, irritability, decreased libido



# ED: Treatment

- Clomiphene citrate 25mg q.o.d. \_ 50mg q.o.d.
- Testosterone replacement
  - Injection- Depo-testosterone, Delatestryl 200-400 IM q 2-3 weeks; if \_\_ symptoms, use 100mg weekly
  - Transdermal patch (androderm) 2.5-5 mg/d
  - Transdermal gel (androgel)5gm/d; Testim 1% (5 gm/d), both preparations deliver 50mg testosterone per 5 gm of gel.
  - Monitor: prostate symptoms, PSA, CBC, lipids (\_ LDL, \_ total Chol, +/- HDL), sleep disorders

Morales, A. Heaton, JPW(2001): Hormonal erectile dysfunction  
*Urology Clinics of North America*, 28(2) 279-288



# Androgen Replacement Therapy

## Side Effects

- polycythemia
- worsen sleep apnea
- promote prostate growth
- prevent sperm production
- shrink the testicles
- cause acne, breast swelling, and fluid retention.



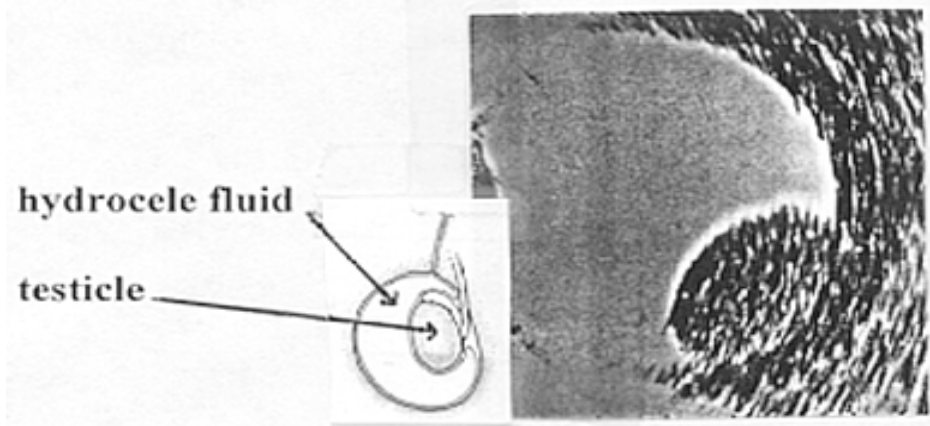
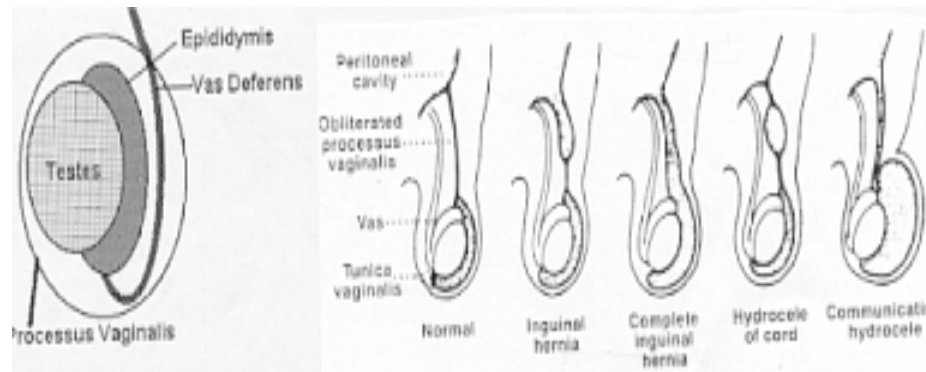
# Scrotal Pain



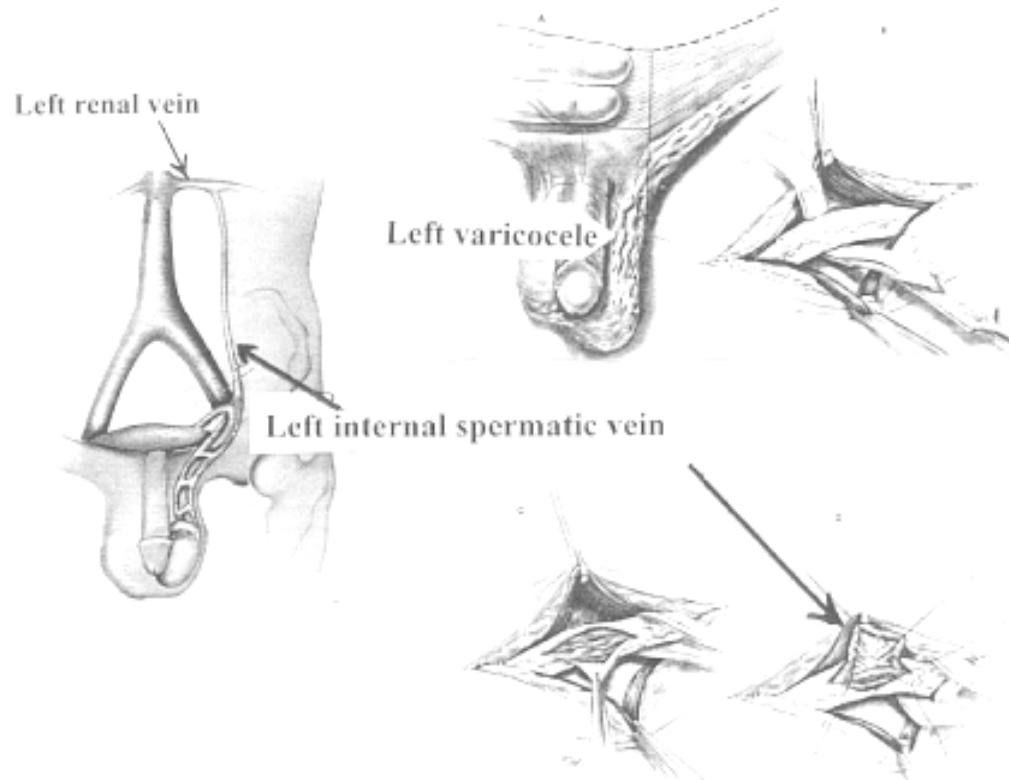
# Scrotal Pain: Differential

- Torsion
- Trauma
- Tumor
- Infection
- Varicocele
- Hydrocele
- Hernia

# Hydrocele/Hernia



# Varicocele

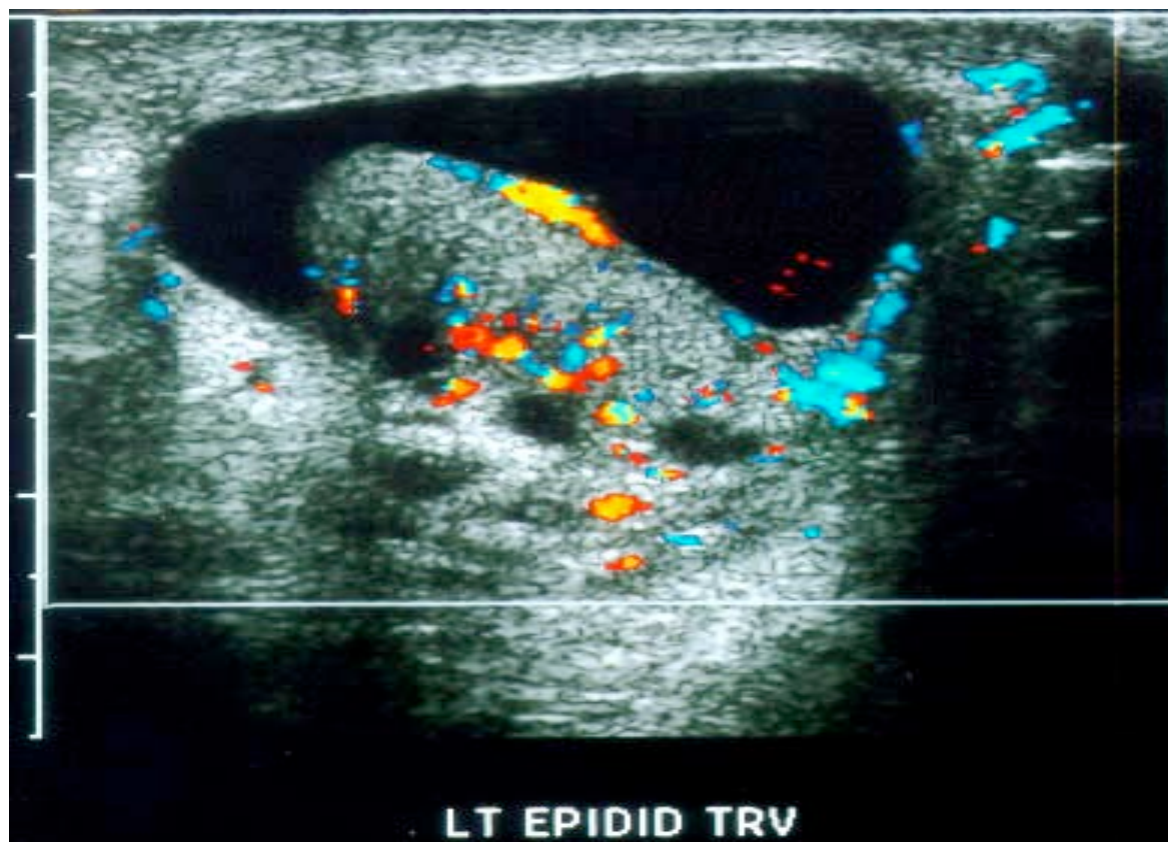




# Infection: Epididymitis

- Acute/chronic: pain radiates to inguinal area, red, swollen scrotum, reactive hydrocele, + U/A, less pain w/ elevation of testicle,
- Scrotal US to R/O abscess, torsion
- Bacterial 2° to ascending infection
- Men < 35, chlamydia \_ doxycycline x 14 d; bed rest, scrotal elevation, ice x 48 hr; ibuprophen
- Men > 35, e.coli \_ quinolone x 14 d; bed rest, scrotal elevation, ice x 48 hr; ibuprophen

Epididymitis: Scrotal US shows increased blood flow to epididymis





# GU Emergencies



# GU Emergencies

- Priapism
- Testicular torsion
- Trauma
- Septic stone



# Priapism

- Prolonged erection > 6 hours
- Low flow – veno-occlusive
- High flow – arterial
- Etiology: medications, diseases (40% sickle cell), cancer

Pauller, S.E.: Priapism: From Priapus to the present time. *Urologic Clinics of North America*; 28(2): 391-403, 2001



# Priapism: Treatment

- Stat urology referral
- Impotence > 50% if duration > 24 hrs.
- Medications: sudafed, brethine, phenyepherine, epinephrine
- Aspiration of old blood
- Surgery
- Embolization

Pauller, S.E.: Priapism: From Priapus to the present time. *Urologic Clinics of North America*; 28(2): 391-403, 2001



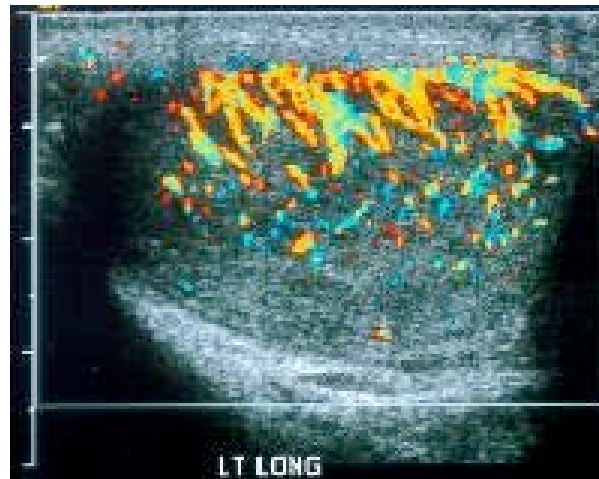
# Testicular Torsion

- Ischemia due to twist w/i tunica vaginalis
- Sudden onset
- Differential Dx: epididymitis, tumor, trauma, torsion appendix testis
- Treatment: surgical detorsion/ ‘pex’ contralateral testicle

Rabinowitz, R., Hubert, W.C.: Acute scrotal swelling. *Urologic Clinics of North America*; 22(1): 101-105, 1995

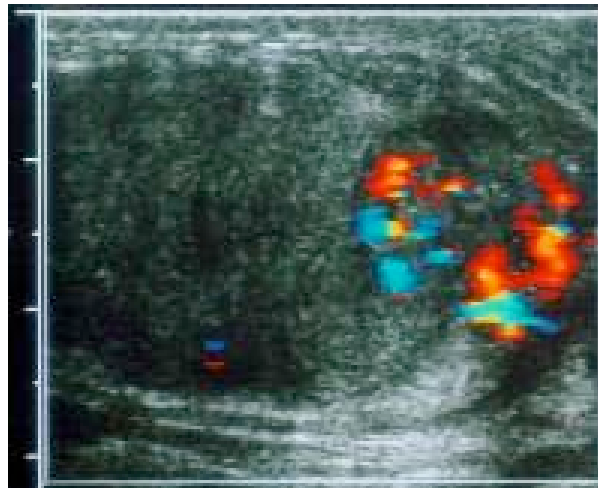
# Testicular Torsion

Normal blood flow to testicle



# Testicular Torsion

No blood flow to testicle

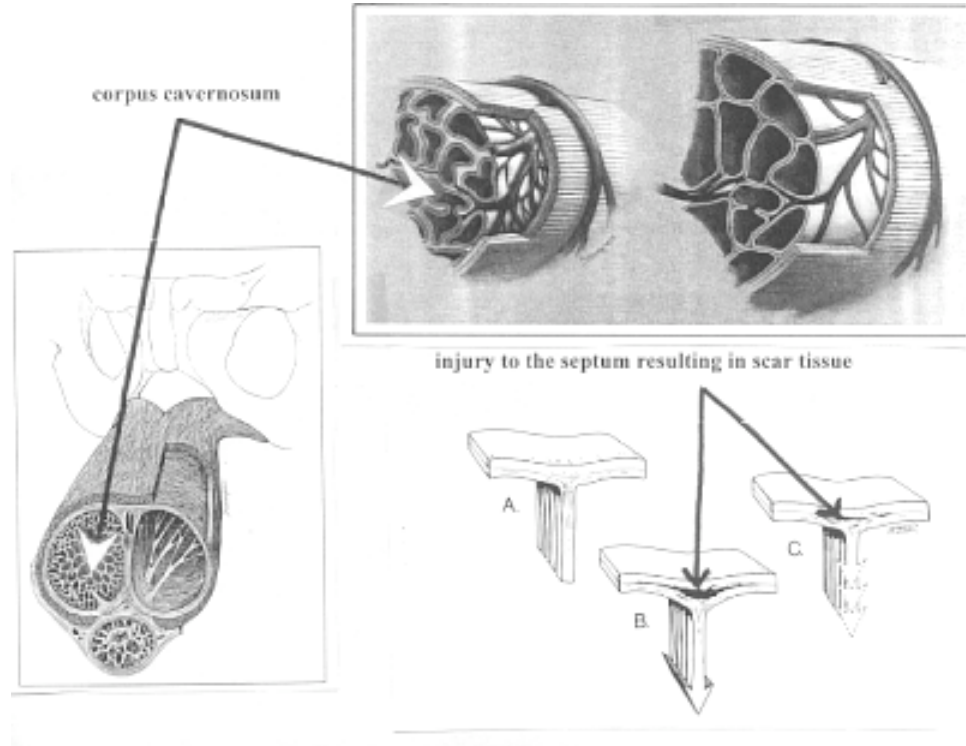




# Trauma: Fractured Penis

- Disruption of tunica albuginea
- Associated w/ urethral injury 38% of cases
- Etiology: vigorous intercourse, rolling over on an erect penis
- Hx: ‘snapping sound’ with injury followed by penile ecchymosis and swelling
- Treatment: surgical repair

McAninch, JW., Santucci, RA: Genitourinary trauma in Walsh, PC, ed., *Campbell's Urology*, 8<sup>th</sup> ed., Philadelphia, W.B. Saunders, 2000, 3707-3744.





# Septic Stone

- UTI associated with obstruction
- Fever, chills, flank pain
- Sepsis → septic shock
- ✓ Rx: stat urology referral, antibiotics, fluid resuscitation, relieve obstruction



# **Benign Prostatic Enlargement**



## BPE: Etiology

- Diet: high fat, obesity, inflammation
- Lifestyle: smoking, inactivity
- Genetics: weak association
- Age
- Hormones



# BPE: Etiology

- Interplay of cell proliferation and death
- Composition: 3 cell types
  - Smooth muscle (**stromal**)
  - Connective tissue (**stromal**)
  - Glandular proliferation (**epithelial**)
- Three Zones:
  - Peripheral
  - Transitional
  - Central



## BPE: Incidence

- Begins at age 40
  - 40% of men age 50; 60% age 60; 90% age 80
  - 1/2 of men w/histologic BPH have symptoms
  - Half of men w/symptoms have ↓ QOL
  - TURP: most common operation after cataract (300,000 annually)
  - 1.7 million office visits annually



# BPE

## ■ Signs:

- Increased post-void residual
- UTI's
- Renal insufficiency
- Bladder diverticulae
- Stones
- Hematuria



# BPE

## ■ Symptoms

- *Irritative*: urgency, frequency, nocturia
- *Obstructive*: weak stream, hesitancy, straining, sense of incomplete emptying.



# BPE Evaluation

- History: Symptom score- International Prostate Symptom Score (IPSS)  
(0-7) mild (8-19) moderate (20-35) severe;  
*'Bother'* question (QOL)
  - Medications: anticholinergic, antihistamine, diuretics
  - Voiding diary
- PE:
  - DRE
  - Bladder scan
  - I/O cath



# BPE Evaluation

- Studies:
  - U/A (urine cytology optional if mainly irritative voiding symptoms)
  - PSA in selected patients
  - Urodynamics in selected patients
  - Cystoscopy in selected patients

[http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines/archived-guidelines/chapt\\_1\\_appendix.pdf](http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines/archived-guidelines/chapt_1_appendix.pdf) accessed April 1, 2010.



## BPE Evaluation: PSA

- Prostate specific antigen
- Secreted by epithelial cells
- May be increased with BPE



# BPE: Lower Urinary Tract Symptoms (LUTS)

## ■ Differential:

- Neurologic disease, MS, CVA, Parkinson's
- UTI
- Prostate cancer
- CIS bladder
- Urethral stricture
- Diet/Lifestyle



# Male Cystitis

- Signs/Symptoms: urinary urgency, frequency, malodorous urine, hematuria, abnormal U/A
- Evaluation: DRE, urine C & S, bladder scan for PVR, imaging study (US, KUB, CT scan), cystoscopy
- Treatment: antibiotics, correct problem



# BPE: Digital Rectal Exam (DRE)

- Only evaluates the peripheral zone
- Technique
  - Standing
  - Lateral decubitus
- Documentation
  - Size
  - Consistency
  - Symmetry
  - Tenderness



# BPE: Treatment

- Watchful waiting
- Phytotherapy
- Medications
- Surgery



# BPE Treatment: Watchful waiting

- *Majority remain stable or improve (85%), 15% progress*
- **Contraindications:**
  - Urinary retention
  - Recurrent UTI's
  - Persistent hematuria
  - Bladder diverticulae
  - Bladder stones
  - Renal failure



# BPE Treatment: Phytotherapy

- European experience
- Herbs
- Risks
- Benefits (best results w/ mild LUTS)

Wilt, TJ: Saw Palmetto extracts for treatment of benign prostatic hyperplasia: a systematic review. *Journal of the American Medical Association*; 280: 1604-1609, 1996

McClure, MW: An overview of holistic medicine and complementary and alternative medicine for the prevention and treatment of BPH prostatitis and prostate cancer. *World Journal of Urology* (5)273-284, 2002

Bent, Stephen, et al: Saw Palmetto for Benign Prostatic Hyperplasia. *NEJM*; 354:557-566, 2006



# BPE Treatments:

## ■ Medications

- ✓  $\alpha$  blockers: (**retinal detachment warning**)
  - ✓ Hytrin, Cardura, Flomax, Uroxatrol, Rapaflo
- ✓ 5  $\alpha$  reductase inhibitors:
  - ✓ Proscar, Avodart
- ✓ Anticholinergic medications:
  - ✓ Detrol, Ditropan, Vesicare, Sanctura, Oxytrol, Toviaz, Enablex, Gelnique

O'Leary, MP: Evaluation and Management of benign prostatic hyperplasia: Proceedings of a thought leader conference held March 31, 2001. *Urology*;58(6A):S:1-82, 2001



# Medical Therapy of Prostate Symptoms Study (MTOPS)

- 4 year prospective randomized DBPC study comparing Proscar vs. Cardura, vs. combination therapy, vs. placebo
- Measured UTIs, renal failure, improvement of IPSS > 4, urinary retention
- Results: Proscar and Cardura ↓ risk 1/3 compared to placebo; combination ↓ risk 2/3

McConnell, JD, et al. The Long-term Effect of Doxazosin, Finasteride, and Combination Therapy on the Clinical Progression of Benign Prostatic Hyperplasia. NEJM, 2003; 349 (25); 2387-2398.



# BPE Treatments

## Minimally invasive therapies

- Hyperthermia
  - TUNA, Microwave, Laser
    - [http://www.amsgreenlight.com/phys\\_resource\\_video.html](http://www.amsgreenlight.com/phys_resource_video.html)
- TUIP
  - Transurethral incision of the prostate
- TURP
  - Transurethral resection of the prostate



# Prostatitis



# Prostatitis

- Inflammation
- Most common reason men < 50 y.o. see a urologist
- Poorly diagnosed and treated
- Symptoms may be caused by bladder, prostate, muscle, or GI-related causes



# Prostatitis-NIH Classification

- Type 1 acute bacterial
- Type 2 chronic bacterial
- Type 3A inflammatory non-bacterial
- Type 3B non-inflammatory non-bacterial
- Type 4 asymptomatic inflammatory

Nickel, J.C. (1998) Effective office management of chronic prostatitis  
*Urology Clinics of North America* 25 (40 677-684)



# Prostatitis: Etiology

- Manipulation of urinary tract
- Unsafe sexual practices
- Reflux
- Muscle spasms



# Prostatitis: Etiology

- Chronic Pelvic Pain Syndrome\*
- Pelvic Muscle myalgia (headache in the pelvis)
- macrophages \_\_ cytokines \_\_ Local inflammation \_ upregulation of the spinal and CNS \_ hypersensitivity locally, globally

\*[http://www.uroweb.org/gls/EU/2010%20CPP%20Eur%20Urol%2057\(1\)35-48%20Fall%20et%20al.pdf](http://www.uroweb.org/gls/EU/2010%20CPP%20Eur%20Urol%2057(1)35-48%20Fall%20et%20al.pdf) accessed April 1, 2011



# Prostatitis: Diagnosis

- History
- PE - DRE
- EPS (expressed prostatic secretions)
- Urine C&S (post-prostate massage)
- Symptom frequency questionnaire



# Prostatitis: Treatment

- Medications: Antibiotics, alpha-blockers, muscle relaxants, anti-inflammatory meds
- Biofeedback
- Natural therapies- diet, lifestyle, phytotherapy
- Probiotics

McClure, M: An overview of holistic medicine and complementary and alternative medicine for the prevention and treatment of BPH prostatitis and prostate cancer. *World Journal of Urology* (5)273-284, 2002



# GU Cancers



## GU Cancers (22% of all cancers)

- Prostate
- Bladder
- Kidney
- Testicular



# Prostate Cancer

# Prostate Cancer: Etiology

- Mean age at diagnosis = age 65
- **Family history:** number of 1<sup>st</sup> degree relatives: 1 → 2x risk; 2 → 6x risk; 3 → 11x risk
  - Genetic prostate cancer: 2 1<sup>st</sup> degree relatives < 55y.o., CaP in 3 generations, or 3 1<sup>st</sup> degree relatives → 15 x risk (50% lifetime risk)
- AA 2x risk of Caucasian males
- **Androgens** stimulate prostate cell growth but *do not* cause prostate cancer
- Diet: high fat, meat-based, ↑ risk

Carter, BS, et.al.: Mendelian inheritance of familial prostate cancer. *Proceedings of the National Academy of Science USA*; 89:3367-3371, 1992



# Prostate Cancer: Incidence

- 16% lifetime incidence, 3% lifetime risk of dying as a result of prostate cancer\_
- #1 cause of cancer in men → estimate 217,730 new cases in 2010\_
- # 2 cause of cancer-related death in men → estimate 32,050 deaths in 2010\_

\_ Carroll, P., et.al.: Prostate-specific antigen Best Practice Policy –Part I: Early detection and diagnosis of prostate cancer. *Urology*; 54: 217-224, 2001

\_ <http://www.cancer.org/cancer/prostatecancer/detailedguide/prostate-cancer-key-statistics> accessed April 1, 2011



# Prostate Cancer: PSA Screening

## ■ Benefits

- Earlier detection → 2.6-11.2 yr. earlier diagnosis than DRE
- Less advanced disease: prior to PSA, 35% had metastatic disease at diagnosis; now 5%
- Decreased death rate (50% \_ mortality and 3x \_ metastatic disease since 1990)

Fritz H. Schröder, M.D., et.al: Screening and Prostate-Cancer Mortality in a Randomized European Study. *NEJM*; 360(13):1320-1328, 2009.

Weir, HK, et.al.: Annual report to the nation on the status of cancer 1975-2000, featuring use of surveillance data for cancer prevention and control. *Journal National Cancer Institute*; 95(17): 1276-1299, 2003

Carroll, P., et.al.: Prostate-specific antigen Best Practice Policy –Part I: Early detection and diagnosis of prostate cancer. *Urology*; 54: 217-224, 2001



# Prostate Cancer: PSA Screening

## ■ Risks

- Detect insignificant cancers
- Rx may be unnecessary
- Treatment morbidity: ED/UI
- Cost

Andriole, GL, et al.: Mortality Results from a Prostate Cancer-screening Trial, *N Engl J Med* 2009; 360: 1310-1319.

Schroeder, FH, et al: Screening and Prostate Cancer Mortality in a Randomized European Study, *N Engl J Med* 2009; 360: 1320-1328.

Benoit, RM, et.al.: The Socioeconomic Implications of prostate-specific antigen screening. *Urologic Clinics of North America*; 24(2): 451-458, 1997

Carroll, P., et.al.: Prostate-specific antigen Best Practice Policy –Part I: Early detection and diagnosis of prostate cancer. *Urology*; 54: 217-224, 2001

Woolf, SH: Screening for prostate cancer with prostate-specific antigen: An examination of the evidence. *New England Journal of Medicine*; 333: 1401-1405, 1995

Partin, AW, et.a.: Combination of prostate-specific antigen, clinical stage, and Gleason Score to predict pathologic stage of localized prostate cancer: A multi-institution update. *Journal of the American Medical Association*; 277: 1445-1451, 1997



# Prostate Cancer Screening

- PLCO Trial: 76,693 US men, no reduction in mortality at 7 years in screened group
- ERSPC Trial: 162,000 from 7 European countries, 20% mortality reduction at 8 years, 36% at 12 years, 22% \_ in T3,T4 lesions; 41% \_ in M1 lesions.
- To save one life, NNS 1410, NNT 48.
- 85% men with \_ PSA or abn. DRE had a prostate bx. in ERSPC vs. 30% in PLCO trial
- 50% of control arm in PLCO trial had PSA testing

Andriole, GL, et al.: Mortality Results from a Prostate Cancer-screening Trial, *N Engl J Med* 2009; 360: 1310-1319.

Schroeder, FH, et al: Screening and Prostate Cancer Mortality in a Randomized European Study, *N Engl J Med* 2009; 360: 1320-1328.



# Prostate Cancer: PSA

- 67.5-80% sensitivity if PSA < 4
- 60-70% specificity if PSA > 4
- PSA <2.5 = 15% (15% Gleason  $\geq$  7); PSA 2.5-4 = 25% CaP; PSA 4-10 = 25% CaP; >10 = > 50% CaP
- Note: 1/3 of men with CaP have a normal PSA

Brawer, MK. Prostate-specific antigen: Current status. *Ca Cancer Journal for Clinicians*; 49: 264-281, 1999

Thompson IM, Goodman, IM, McNeal, JE, et al: The influence of finasteride on the development of prostate cancer. *N Engl J Med* 2003; 349 (3): 211-220.



# Prostate Cancer: PSA

- Improve Sensitivity:
  - Age adjusted PSA
  - PSA velocity\_
  - Lower normal threshold to 2.5

Carroll, P., et.al.: Prostate-specific antigen Best Practice Policy –Part I: Early detection and diagnosis of prostate cancer. *Urology*; 54: 217-224, 2001

[\\_http://www.dukemednews.duke.edu/news/article.php?id=9530](http://www.dukemednews.duke.edu/news/article.php?id=9530)

# Age adjusted PSA

Age range	Asians	African Americans	Whites
40-49	0-2	0-2	0-2.5
50-59	0-3	0-4	0-3.5
60-69	0-4	0-4.5	0-4.5
70-79	0-5	0-5.5	0-6.5



# Prostate Cancer: PSA

- Improve Specificity
  - Age-adjusted PSA
  - Free-to-total PSA
  - PSA density
  - PCA3*Plus* urine test

Catalona, WJ. et al.: Use of the percentage free prostate-specific antigen to enhance differentiation of prostate cancer from benign prostatic diseases. *Journal of the American Medical Association*; 279: 1542-1547, 1998

# Total/percentage free PSA

Catalona et al: *JAMA* 279:1542-1547 (1998)

PSA NG/ML	% Free PSA	Probability Ca
0-2	N/A	1%
2-4	N/A	15%
4.1-10	0-10%	56%
	11-15%	28%
	16-20%	20%
	21-25%	16%
	>26%	8%
> 10	N/A	> 50%



# Prostate Cancer: Surveillance

- After surgery – ultra-PSA < 0.05
- After radiation – PSA < 0.5
- After brachytherapy - PSA < 0.5
- After cryotherapy - PSA < 0.5



# Bladder Cancer



# Bladder Cancer

- Environmental

- aniline dye, smoking, pelvic XRT, chronic infections

- Genetic

- p53 abnormality, tumor suppressor gene, abnormal expression of Rb susceptibility tumor expression

Lee, R. Draller, M. (2000) The natural history of bladder cancer: Implications for therapy  
*Urology Clinics of North America* 22 (1) 1-14



# Bladder Cancer: Incidence

- 2<sup>nd</sup> leading cause of GU cancer
- Estimate 70,530 cases in 2010; men vs. women 3:1, the 4<sup>th</sup> most common in men and the 8<sup>th</sup> in women.
- Deaths: estimate 14,680 in 2010
- ✓ ↑ with age; median age 69 (men) 71 (women)

<http://www.cancer.net/patient/Cancer+Types/Bladder+Cancer?sectionTitle=Statistics> accessed April 1, 2011.



# Bladder Cancer: Signs/Symptoms

- Hematuria, irritative voiding symptoms
- Abnormal urine cytology (atypical, suspicious, positive)



# Bladder Cancer: Evaluation

- Imaging study: depends on risk group -  
Intravenous Urogram (IVU) vs. CT  
Urogram vs. renal ultrasound
- Urine cytology: 50% sensitivity, 90%  
specificity
- Urology referral
- Cystoscopy

# Bladder tumor: cystoscopy





# Bladder Cancer: Treatment

- Natural history: majority are superficial  
TA-70-80% recur, 15% ↑ in stage.
- ✓ Transurethral resection of the bladder  
(TURB)
- ✓ Staging:
  - Clinical: based upon diagnostic studies
  - Pathologic: based upon a tissue specimen



# Bladder Cancer: Type

## ■ Cell Types

- Transitional Cell Ca TCC 90%
- Squamous Cell Ca 3-7%
- Adenocarcinoma 2%

Lee, R. Draller, M. (2000) The natural history of bladder cancer: Implications for therapy  
Urology Clinics of North America 22 (1) 1-14



# Bladder Cancer: other locations

- 15% have upper tract lesions (kidney, ureter)
- Can involve any transitional cell urothelium: renal collecting system, ureter, and/or urethra

Messini, E. (2002) Urothelial tumors of the urinary tract  
Walsh, P. Eighth edition, *Cambell's Urology* 2732-2784



# Bladder Cancer: Treatment

- Surgery
- Chemotherapy

Messini, E. (2002) Urothelial tumors of the urinary tract, in Walsh, P. Eighth edition, *Cambell's Urology* 2732-2784



# Bladder Cancer: Prevention

- Prevention:
  - Intravesical therapy: BCG
  - Diet- at least 64 oz. water daily
  - Lifestyle- stop smoking
  - Environment- avoid bladder toxins
  - Green tea, selenium

McClure, MW: An overview of holistic medicine and complementary and alternative medicine for the prevention and treatment of BPH prostatitis and prostate cancer. *World Journal of Urology* (5)273-284, 2002

Duque, J.L.Longhlin, K.R.: (2000)An overview of the treatment of superficial bladder cancers.*Urology Clinics of North America* 27 (1) 125-135



# Renal Cell Carcinoma

Novick, AC, Campbell, SC. Renal Tumors in Walsh, PC, ed, Campbell's Urology, 8<sup>th</sup> ed., Philadelphia, W.B.Saunders, 2002, 2672-2731



# Renal Cell Carcinoma (RCC)

## Etiology:

- Hereditary (4 types), most common are papillary (BHD gene) and clear cell RCC (Von Hippel Lindau)



# RCC: Etiology

- Environmental

- Smoking ↑ risk twofold

- ✓ Petrochemical

- ✓ Phenacetin

- Lifestyle

- Obesity ↑ risk

- Dialysis



# RCC: Incidence

- Estimate 58,240 cases in 2010 (M-F 2:1)
- Peak at 6<sup>th</sup> decade
- 25% present with metastasis
- Estimate 13,040 deaths in 2010
- No racial differences

—?—

<http://www.cancer.net/patient/Cancer+Types/Kidney+Cancer?sectionTitle=Statistics,ccessed> April 1, 2011



## RCC: Signs/Symptoms

- Classic Triad: flank pain, renal mass, hematuria (10%)
- 60% are incidental findings
- Hematuria
- Metastatic disease- bone, liver, lung, local
- Internist's tumor: FUO, anemia, hypercalcemia, abnormal LFT's



# RCC: Evaluation

- Imaging Studies
  - Renal U/S
  - IVP
  - CT Scan w/wo contrast
  - MRI w/wo gadolinium contrast
  - arteriogram
- Bone Scan- ↑ alk phos, cancer
- CXR



# RCC: Differential

- Benign Lesions (account for 20% of incidentalomas < 4 cm)
  - Oncocytoma
  - Angiomyolipoma
  - Renal cyst (Bosniak classification; 1-4)
- Adenocarcinoma



# RCC:Treatment

- Surgery-radical, partial nephrectomy
- Hyperthermia, cryosurgery, focused ultrasound energy
- Chemotherapy



# Testicular Cancer



# Testicular Cancer: Etiology

- Undescended (cryptorchid) testicle
  - √ → 4-14 x risk, even after surgical repair to place in scrotum
  - 7-10% of testis cancers arise in cryptorchid testes



# Testicular Cancer: Incidence

- 8480 new cases/350 deaths in 2010
- Tri-modal distribution (infants/young adults/men over the age of 65)
- *Most common cancer in males ages 15-35*

<http://www.cancer.net/patient/Cancer+Types/Testicular+Cancer?sectionTitle=Statistics>



# Testicular Ca: Signs/symptoms

- Painless mass (50%)
- Dull ache, heaviness (30-35%)
- Acute pain (10%)
- Gynecomastia (5%)
- Symptoms due to metastasis, lungs, lymph nodes (10%)



# Testicular Ca: Pathophysiology

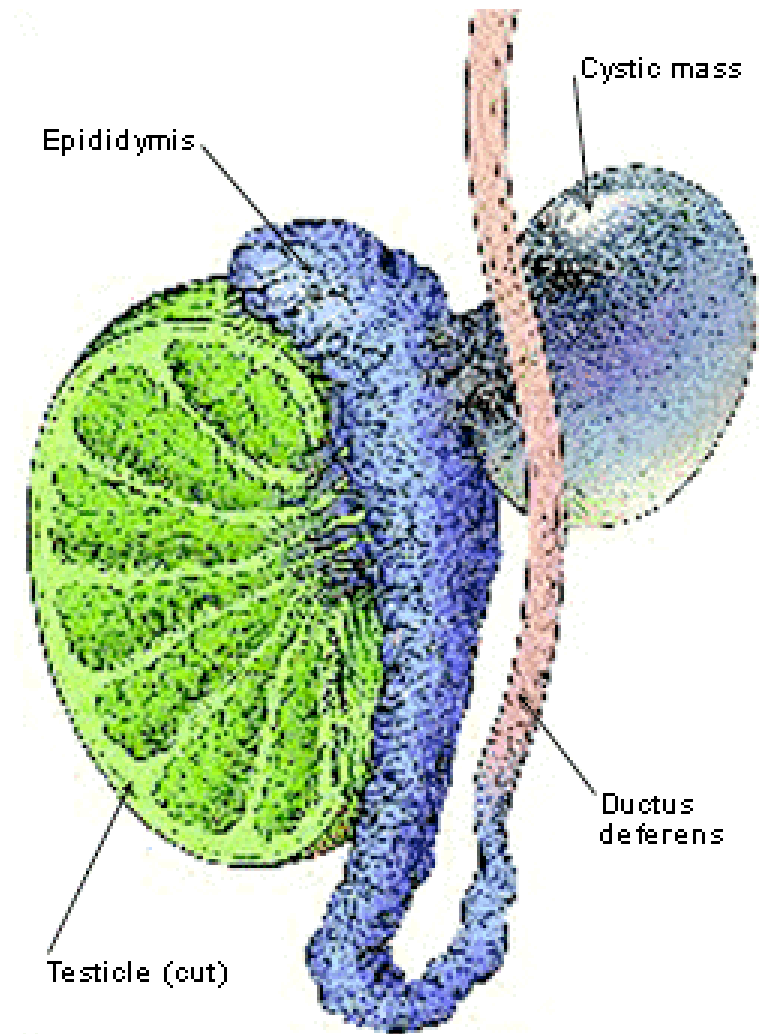
- Germ Cell (90-95%)
  - Seminoma (35-65%)
  - Non-seminomatous germ cell tumors
    - Embryonal Cell (40%)
    - Choriocarcinoma (rare)




# Testicular Cancer: Evaluation

- PE: use both hands
- Scrotal U/S: usually a hypoechoic lesion
- Differential- orchitis , epididymitis, hydrocele, benign tumor

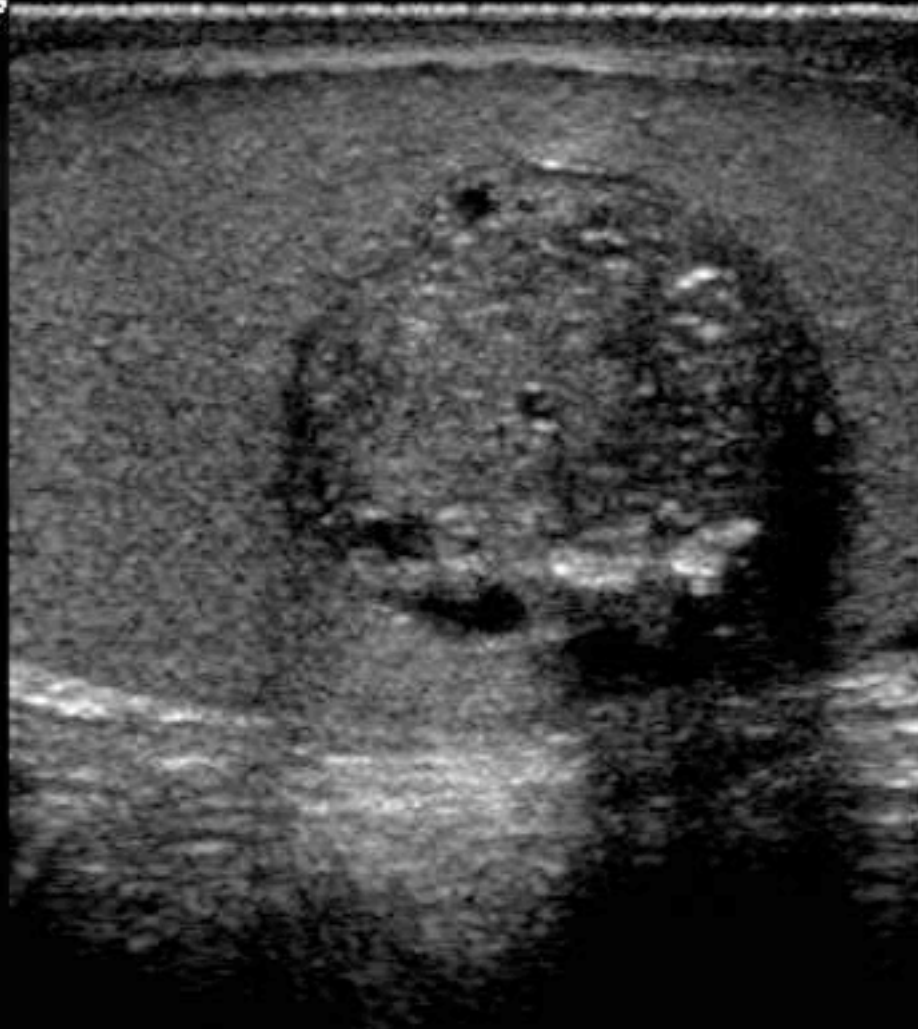
# Epididymal cyst: [http://tcrc.acor.org/medical\\_articles.html](http://tcrc.acor.org/medical_articles.html), access 3/21/2009



 **GE Medical Systems**  
10/30/02 12:16:19 ADM

MI 0.06 TIs 0.1 M12L  
--:--:-- Small Parts





— B CHI  
— Frq 10.0 MHz  
— Gn 66  
— E/A 2/2  
— Map D/1  
— D 4.0 cm  
— DR 78  
1 — FR 7 Hz  
— AO 100 %

—  
—  
2 —  
—  
—  
—  
3 —  
—  
—  
4 —

LARGE TESTICULAR TUMOR



# Testicular Cancer: Treatment

- Surgery
- Radiation
- Chemotherapy

Frohlick, MW, Small, ET: Stage II Non-seminomatous testis cancer: The roles of primary and adjuvant chemotherapy. *Urologic Clinics of North America* ;25(3): 451-459, 1998

A photograph of a walrus lying on a rocky shore. The walrus is the central focus, with its body extending from the left towards the right. Its skin is a reddish-brown color with visible wrinkles. Two long, white tusks are prominent on the left side of its head. The walrus is resting on dark, jagged rocks. In the background, more rocks and some pieces of driftwood are visible. A white rectangular box with a black border is superimposed over the middle of the image, containing the text "Any Questions?".

**Any Questions?**