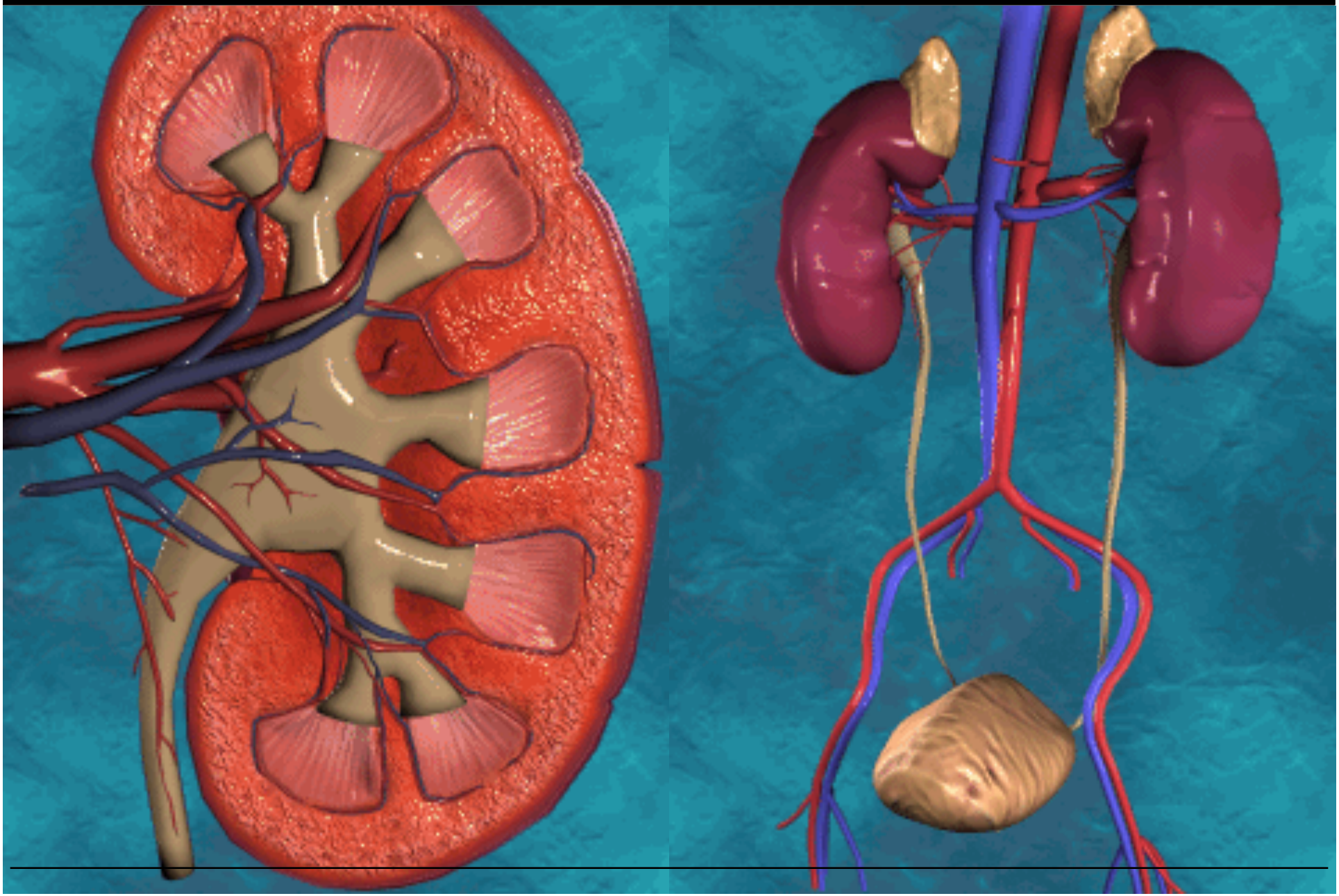
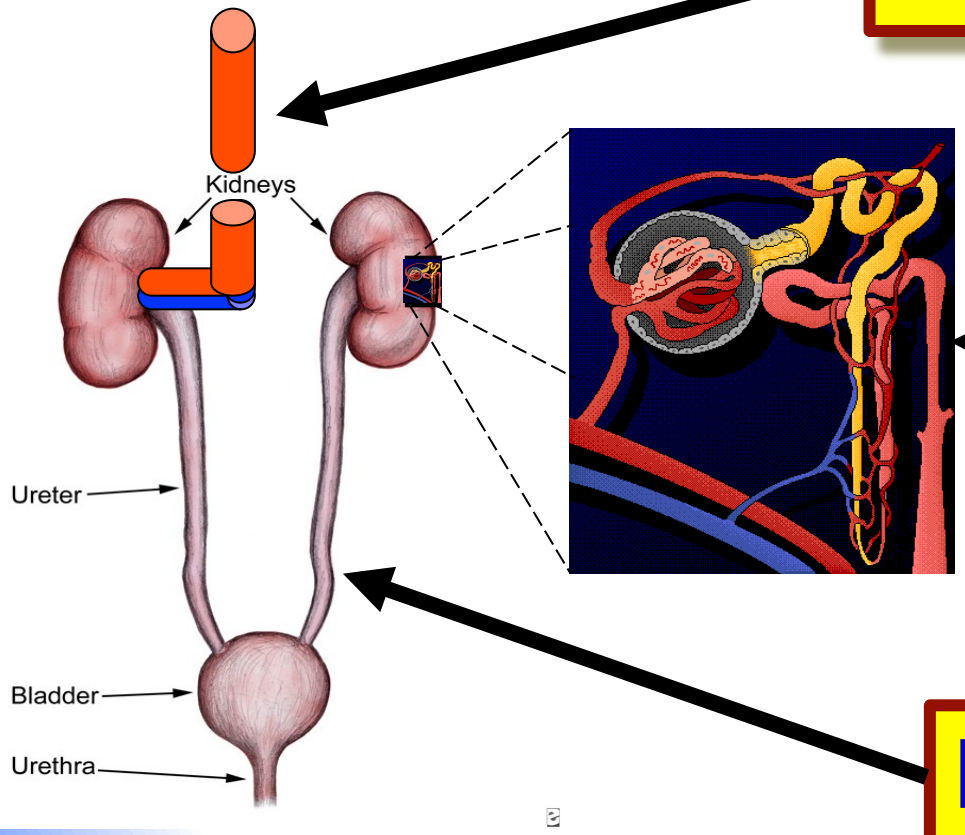
Nephrology / Urology



Acute Renal Failure (1)

PRERENAL



RENAL

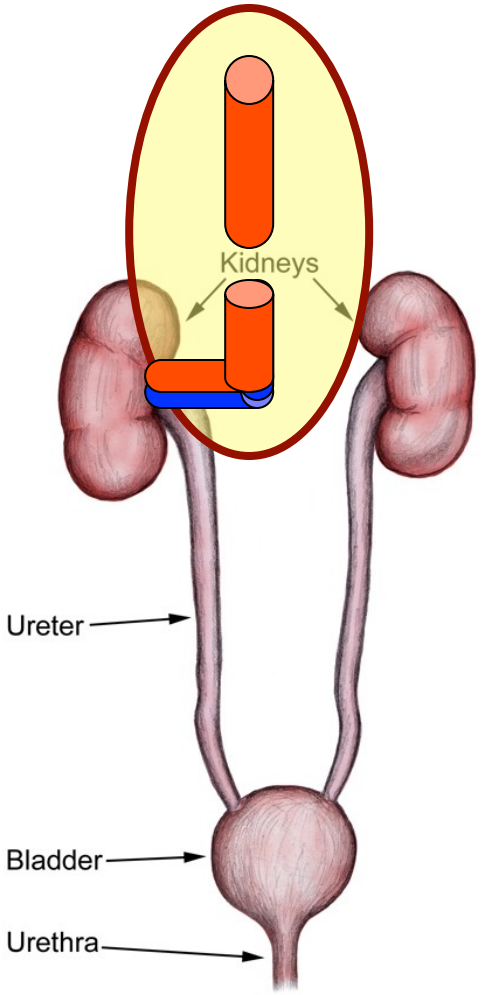
POSTRENAL

Acute Renal Failure (2)

PRERENAL

= Shock (↓ Perfusion)

- **Causes**
  - Hypovolemic (*most common*)
  - Cardiogenic
  - Distributive
- **Treatment**
  - Restore circulating volume
    - Fluids
    - Pressors

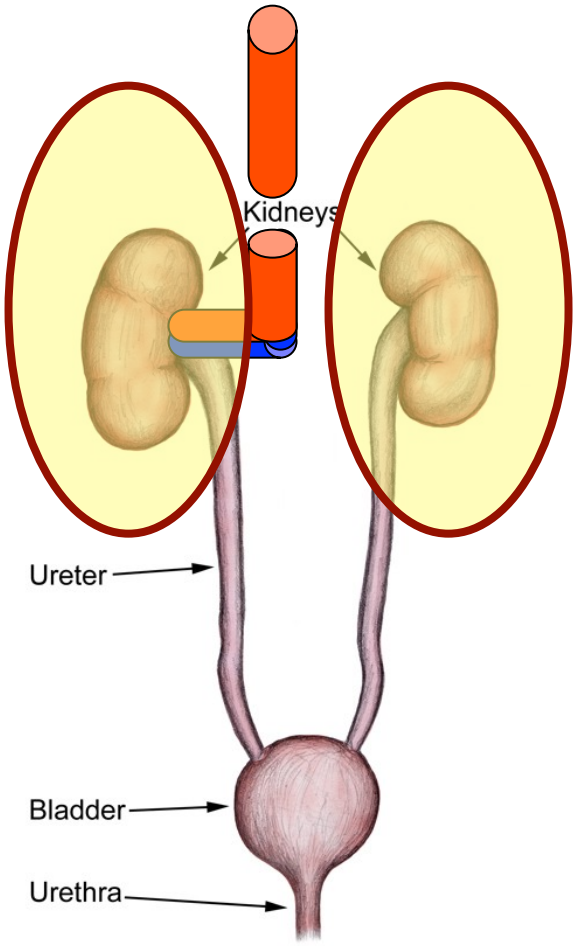


Acute Renal Failure (3)

RENAL

= Intrinsic Disease

- **Causes**
  - **Vascular**
    Dissection, Thrombosis, Emboli
  - **Glomerular**
    Glomerulonephritis (GN)
  - **Interstitial**
    Acute Interstitial Nephritis (AIN)
  - **Tubular** *(most common)*
    Acute Tubular Necrosis (ATN)



Acute Renal Failure (4)

Vascular Causes

- **Catastrophes along the aorta**
  - Dissection
  - Thrombosis
- Emboli

- Suspect when more than one organ along aorta is involved

Acute Renal Failure (5)
Rapidly Progressive Glomerulonephritis (Acute Nephritic Syndrome)

- **Pathology**
  - Immune complexes/antibodies in glomeruli
- **Causes**
  - Autoimmune / Vasculitities
    - **Post-streptococcal GN**
    - Wegeners, Goodpastures Hepatitis B/C
    - SLE, PAN, HSP, HUS, TTP, HELLP
  - Malignant Hypertension

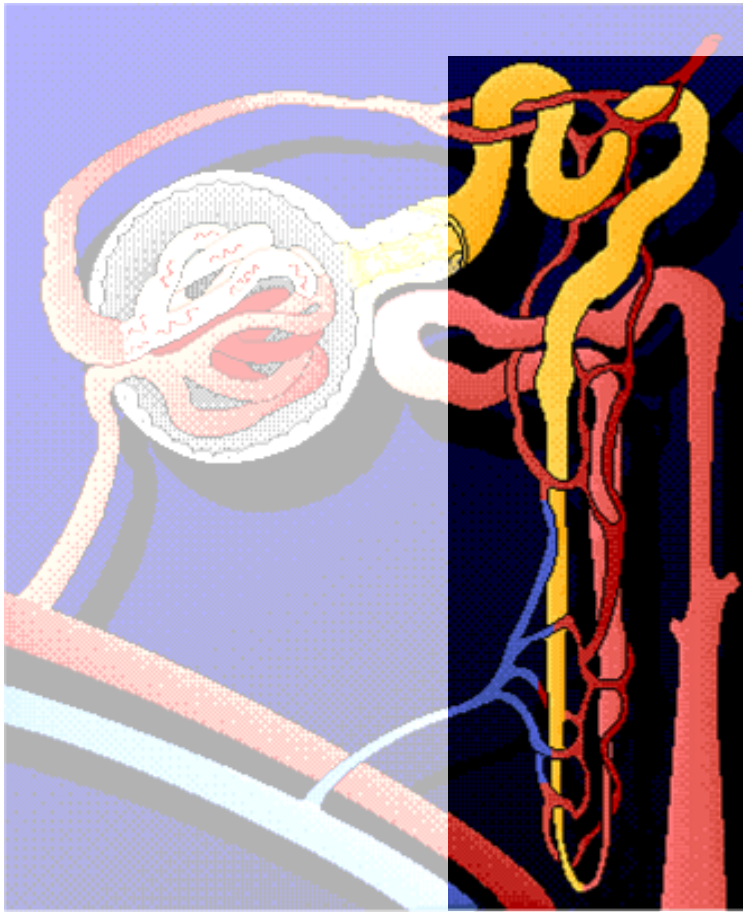
Acute Renal Failure (6)
Rapidly Progressive Glomerulonephritis (Acute Nephritic Syndrome)

- **Clinical Features**
  - Oliguria, edema, hypertension
- **Urine**
  - Hematuria, pyuria, *RBC casts*, mild/moderate proteinuria
- **Treatment**
  - Steroids, immunosuppressive agents

Acute Renal Failure (7)

Acute Interstitial Nephritis (AIN)

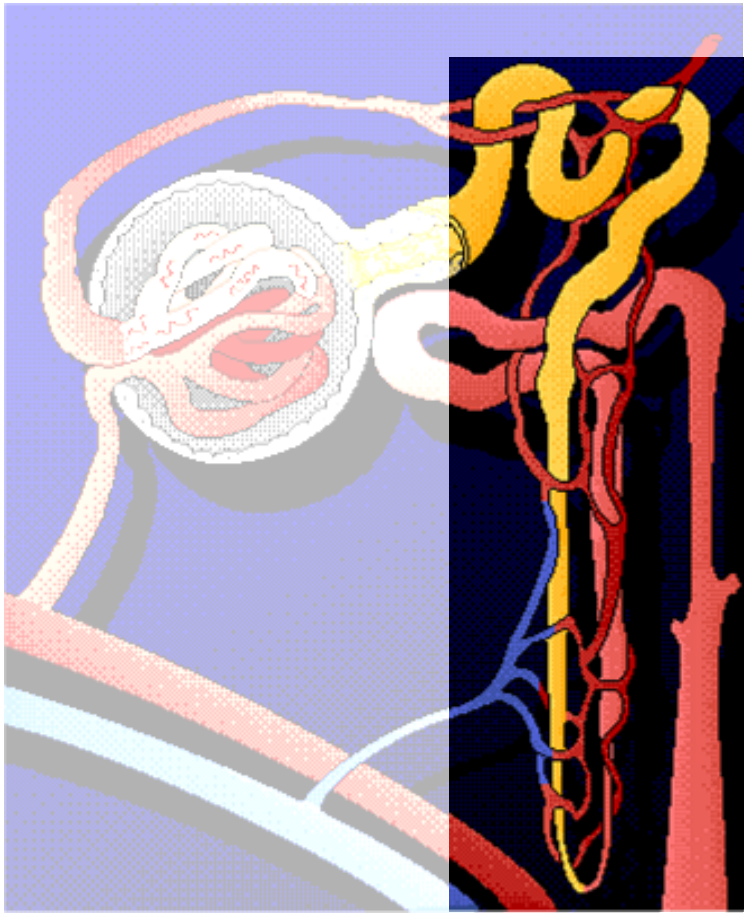
- **Pathology**
  - Immune mediated
- **Causes**
  - Drugs
    - Penicillin, Sulpha
    - Diuretics
    - NSAIDs
  - Infections



Acute Renal Failure (8)

Acute Interstitial Nephritis (AIN)

- **Clinical Features**
  - Fever, rash, eosinophilia
- **Urine**
  - Pyuria, WBC casts, eosinophiluria
- **Treatment**
  - Treat underlying infection
  - Remove offending agent(s)



Acute Renal Failure (9)

Acute Tubular Necrosis (ATN)

Leading cause of renal failure

- **Ischemic**
  - Usually oliguric (<500 mL/day)
  - Leading causes: trauma and sepsis
- **Toxic**
  - Usually *not* oliguric
  - Causes: Contrast media
    Myoglobin(rhabdomyolysis)
    Hemoglobin (hemolysis)
    Aminoglycosides
    Multiple myeloma
    Ethylene glycol

Acute Renal Failure (10)

Rhabdomyolysis (ATN)

- **Pathology**
  - Skeletal muscle injury
  - Myoglobin clogs tubules
  - Myoglobin causes positive dip for heme, but *no RBCs seen on micro*
- **Causes**
  - Trauma, Crush
  - Burns, Electrical injury, TASER
  - Heat stroke, “Found down”
  - EtOH, other drugs

Acute Renal Failure (11)

Rhabdomyolysis (ATN)

- **Diagnosis**
  - CK > 5 times normal for diagnosis (more sensitive marker than myoglobin itself)
  - Dramatic acute increase in creatinine (Cr)
- **Treatment**
  - IV hydration
  - Treat hyperkalemia and hypocalcemia
  - Alkalinization of urine with bicarbonate

Acute Renal Failure (12)

Contrast Induced Nephropathy (ATN)

- Who is at high risk?
  - Pre-existing renal disease
  - Recent contrast study (within 72 hours)
  - Hypotension
  - Dehydration
  - Diabetes
  - Multiple myeloma
  - Age > 70
  - Hypertension
  - Hyperuricemia
  - Diuretics

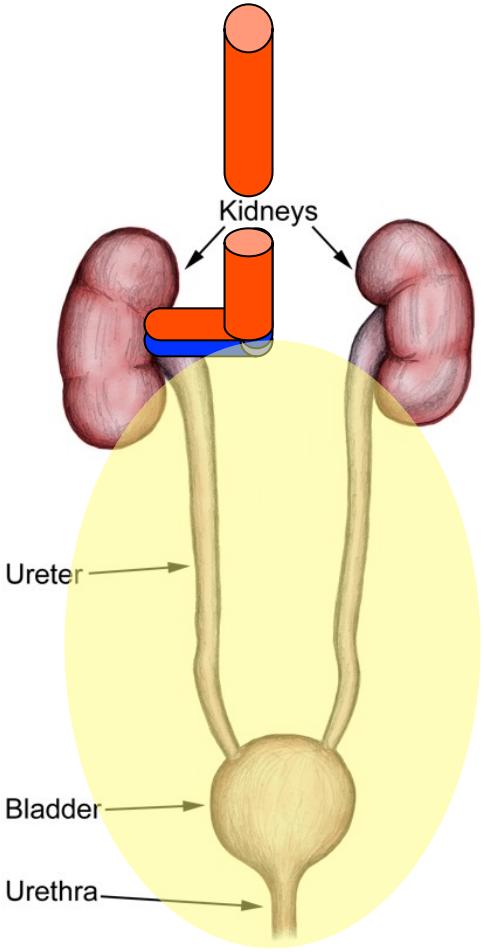
- Mitigating the risk
  - Choose a non-contrast study
  - Volume expansion
  - Low osmolar contrast agents
  - Bicarbonate infusions
  - Hypertonic saline
  - N-acetylcysteine

Acute Renal Failure (13)

POSTRENAL

= Obstruction

- Causes
  - **Bilateral kidney**
    crystals in tubules, stones in calyces
  - **Bilateral ureteric**
    multiple stones, surgically cut retroperitoneal blood, pus or scar, ***papillary necrosis***
  - **Urethral**
    prostatic hypertrophy (*most common*)
    neurogenic bladder
    phimosis, meatal stenosis



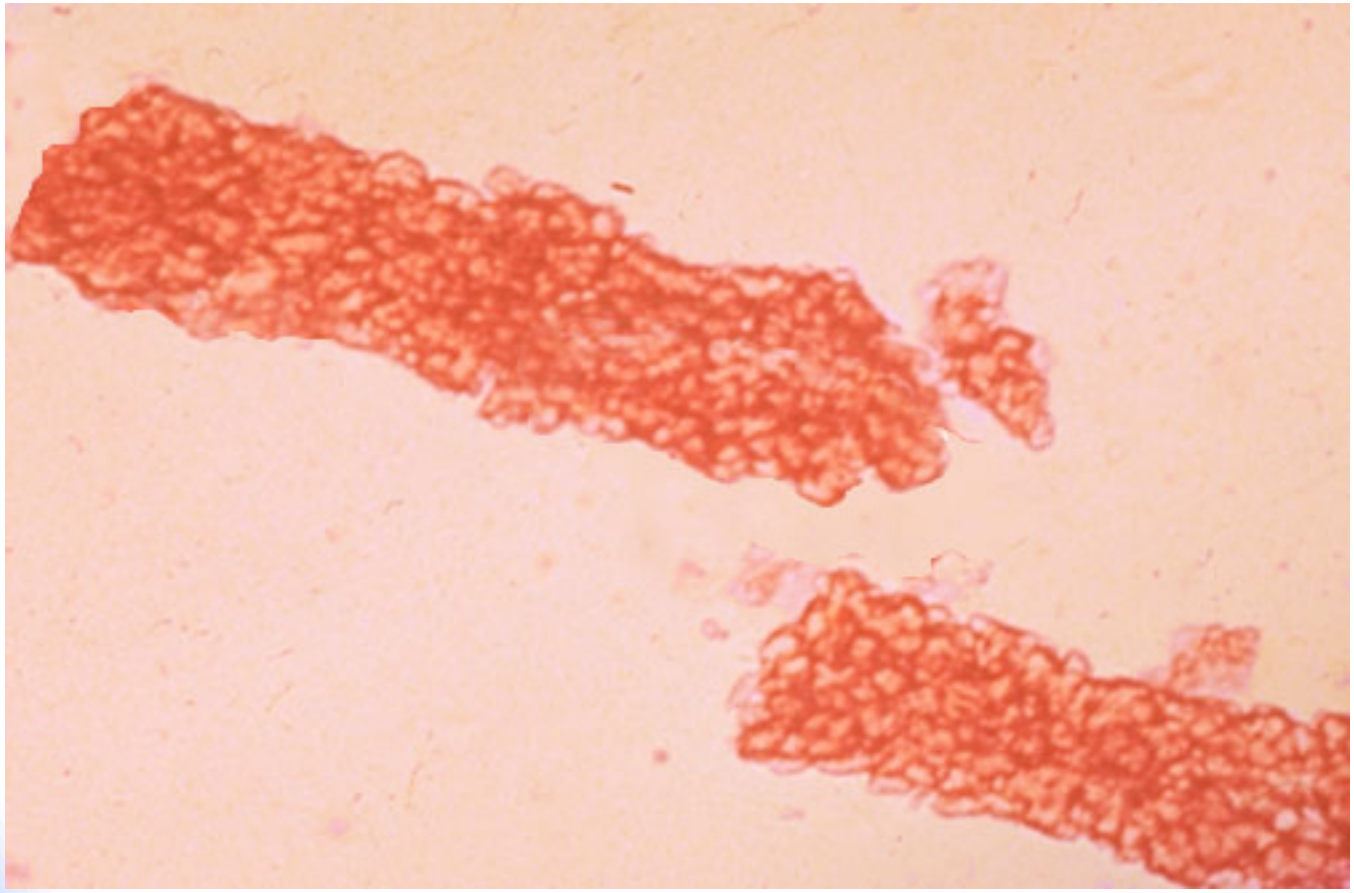
Acute Renal Failure (14)

MEASURE	PRE-RENAL	RENAL (ATN)
Fractional Excretion of Na+ (FENa) %	< 1%	> 1%
Urine Na+ mEq/L	LOW (< 20)	HIGH (> 40)
BUN / Creatinine Ratio	HIGH (> 20)	LOW (< 20)

Acute Renal Failure (15) – U/A

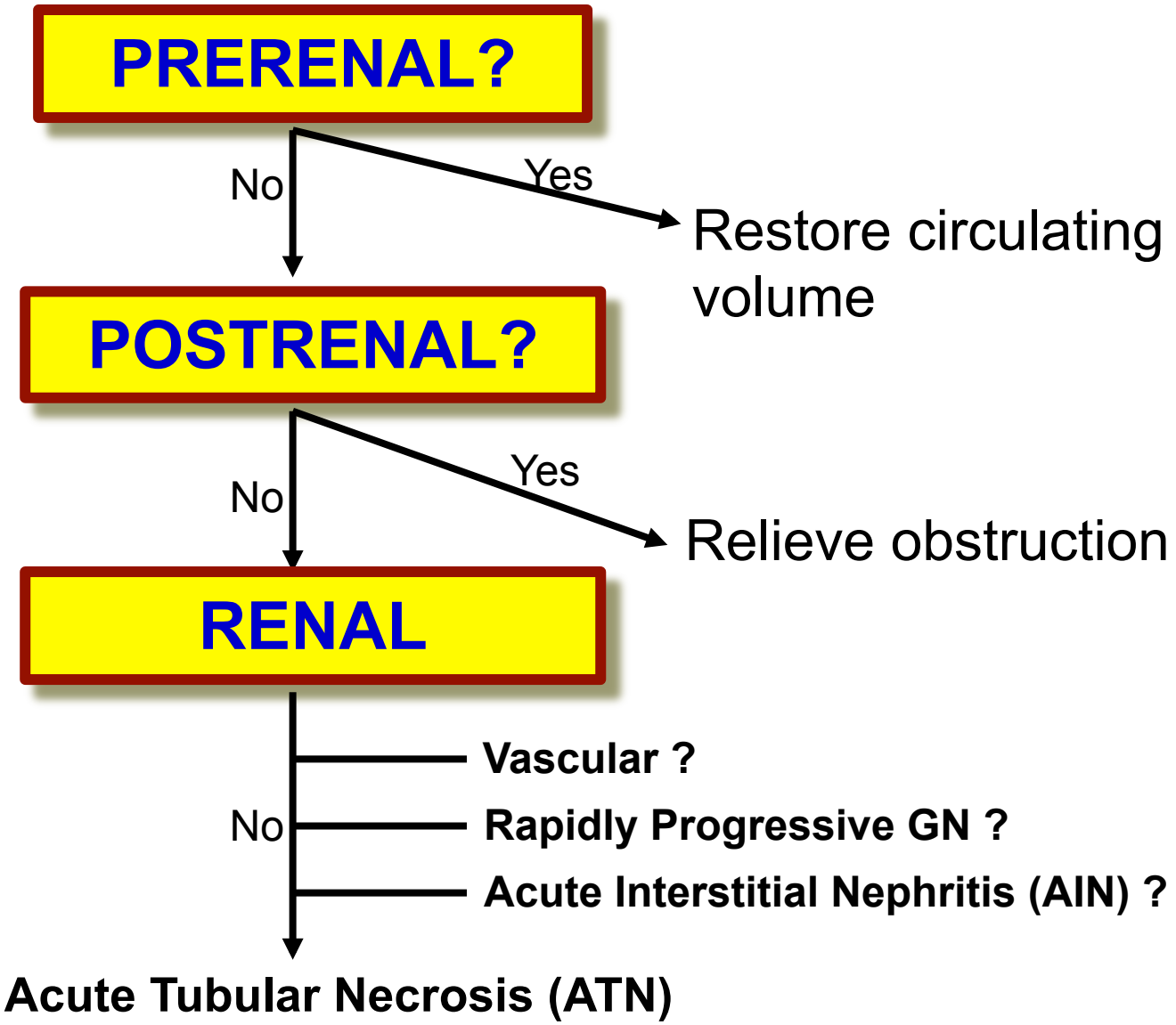
FORMED ELEMENT	LOCATION OF PATHOLOGY	SPECIFIC ENTITIES
RBC Casts (or dysmorphic RBCs)	Glomerular Disease	Nephritic Syndrome (Rapidly progressive GN)
WBC Casts	Interstitium	Pyelonephritis AIN
Eosinophils	Interstitium	Acute Interstitial Nephritis (AIN)
Granular Casts (Cell debris)	Tubule	Acute Tubular Necrosis (ATN)
Hyaline Casts (Acellular)	Pre- or post-renal	Pre- or post-renal acute renal failure

Acute Renal Failure (16) – U/A



RBC Cast

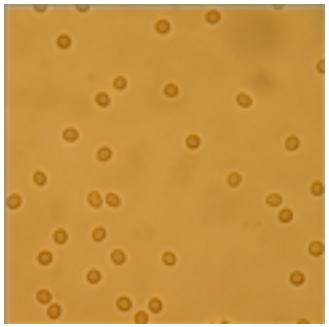
Acute Renal Failure (17) - Summary



Pink Urine

Microscopy

RBCs



- **Hematuria**
  - Kidney stone
  - Cancer
  - Nephritic syndrome

NO RBCs

- **Myoglobinuria**
  - = *Rhabdomyolysis*

VS

- **Hemoglobinuria**
  - = *Intravascular hemolysis*
  - MAHA (DIC, TTP, HUS)
  - Mechanical valve emergency

Chronic Renal Failure

The Nephrotic Syndrome = Nephrosis

- **Clinical Features**
  - Massive proteinuria (>3g/24h)
  - Hypoalbuminemia
  - Edema
  - Hyperlipidemia
  - ***Thrombotic diathesis***
    - ***DVT/PE***

Chronic Renal Failure

The Nephrotic Syndrome = Nephrosis

- **Causes**

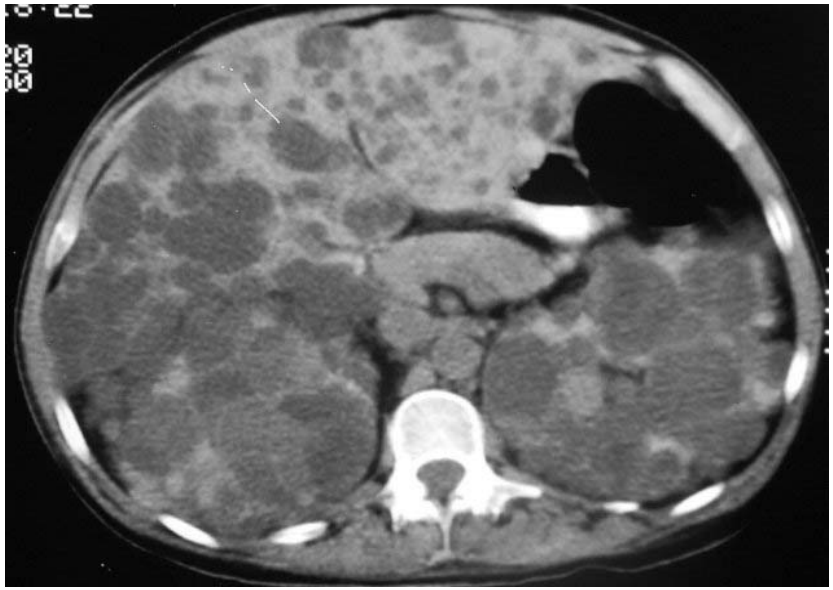
  Primary
  - Idiopathic entities involving kidneys alone
  - Most commonly focal, segmental

  Secondary
  - Diabetes mellitus
  - Henoch-Schonlein purpura (HSP)
  - SLE / Syphilis / Hepatitis B/C
  - **HIV**
  - Cancer
  - Drugs (gold, mercury. heroin)

Chronic Renal Failure

Polycystic Kidney Disease

U/S



CT

- Autosomal Dominant
- Flank Pain and Hematuria
- Progressive Renal Failure
- Association with cerebral aneurysms and SAH

Indications for Emergent Dialysis

- *Refractive* volume overload
- *Refractive* hyperkalemia
- Metabolic acidosis
- Severe Na+ imbalance
- Symptomatic uremia
  - Encephalopathy
  - Pericarditis
  - Bleeding
  - Nausea/vomiting
- Toxins

End Stage Renal Disease (1)
Complications

- **Cardiac**
  - Coronary Artery Disease
  - Severe Refractory Hypertension
  - Uremic Pericarditis
  - Tamponade (*Beck's triad is rare*)
  - Pulmonary Edema (*furosemide ok if any U/O*)
  - Uremic Cardiomyopathy (*Dx of exclusion*)

Consider tamponade in any critically ill ESRD patient

End Stage Renal Disease (2)
Complications

- **Hematologic**
  - All cell lines are affected
    - RBCs → *Anemia*
    - WBCs → *Infection*
    - Platelets → *Bleeding*
- **Neurologic**
  - Subdural hematoma
  - Subarachnoid hemorrhage (with polycystic kidneys)
  - Uremic encephalopathy
  - Dialysis dementia (*Dx of exclusion*)

Consider subdural hematoma in any altered ESRD patient

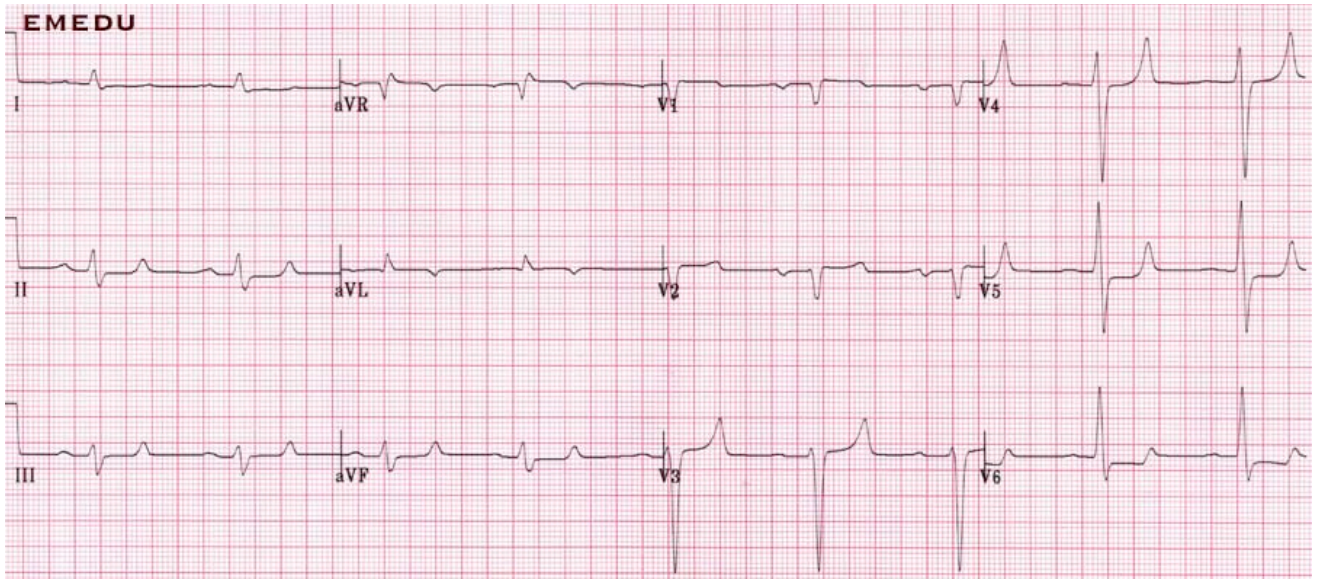
End Stage Renal Disease (3)
Complications

- **Electrolyte**
  - **Hyperkalemia ($\uparrow K^+$)**
    - Bradyasystolic arrest in uremic patients
    - *Stabilize*: Calcium gluconate (for life-threatening rhythms)
    - *Shift*: HCO3, Insulin/D50, Albuterol (for ECG changes or $\uparrow\uparrow$ levels)
    - *Eliminate*: Binding resin (sodium polystyrene)
  - **Hypokalemia ($\downarrow K^+$)**
    - Ventricular fibrillation in dialysed patients
    - PVC's
  - **Hypocalcemia ($\downarrow Ca^{2+}$)**
  - **Hypomagnesemia ($\downarrow Mg^{2+}$)**

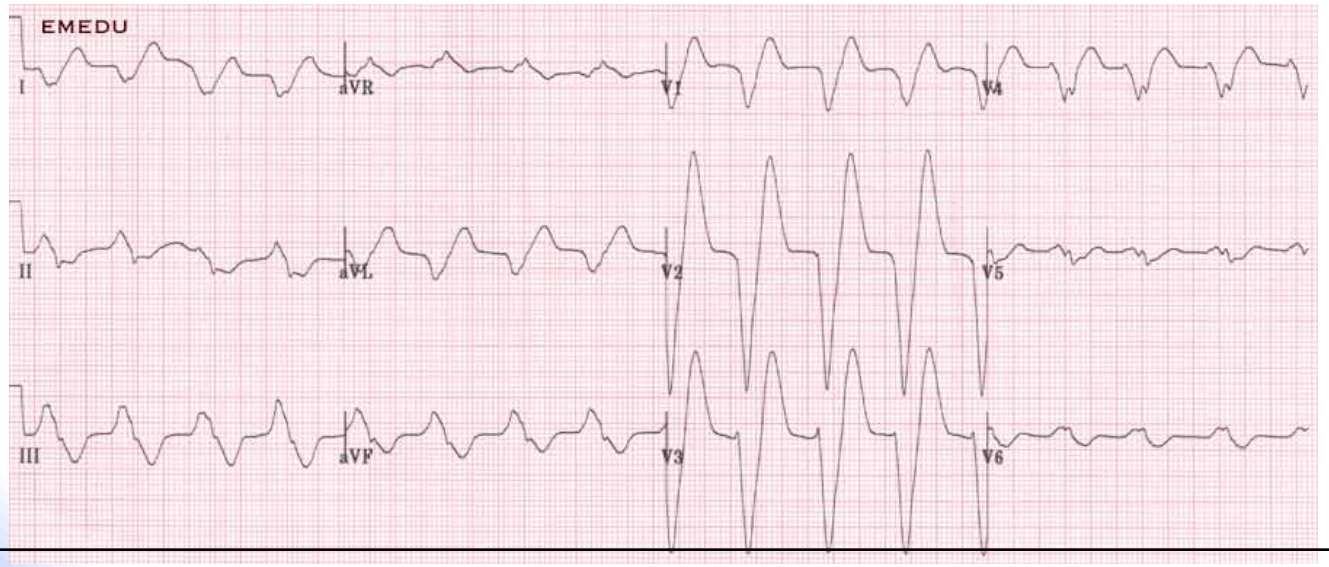
End Stage Renal Disease (4)

The Many Faces of Hyperkalemia

The Good



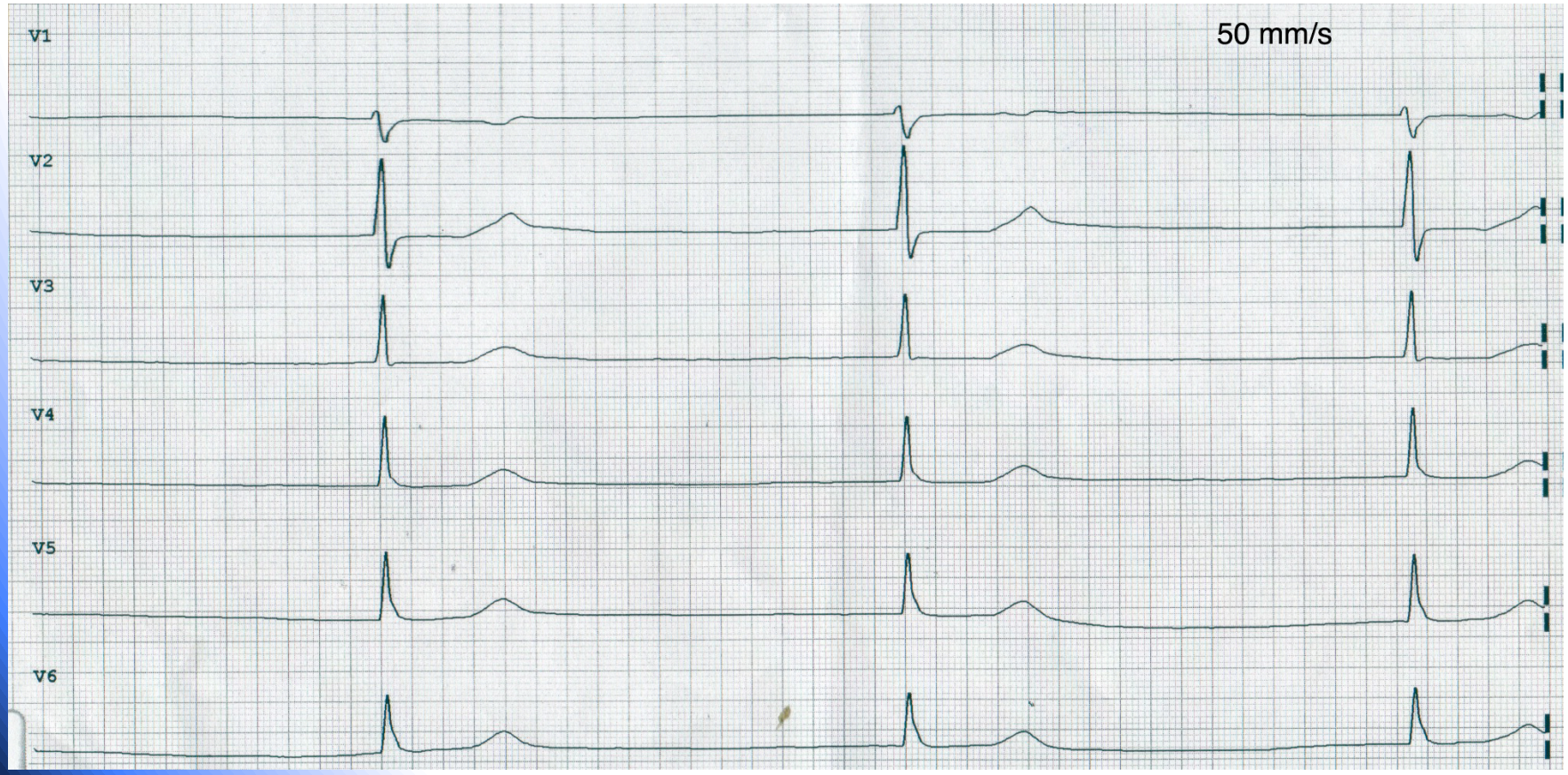
The Bad



End Stage Renal Disease (5)

The Many Faces of Hyperkalemia

The Ugly!



Hemodialysis Complications (1)

- **Hypotension (most common)**
- **Access complications**
  - **Bleeding**
    - Direct pressure or tourniquet if necessary
    - Correct coagulopathy (protamine sulfate, DDAVP)
  - **Clotting**
    - "*The thrill is gone*"
    - Can inject thrombolytic, surgical removal within 24hr
  - **Infection**
    - Cellulitis, abscess, "occult" presentation
    - *S. aureus* and gram negatives (Rx with vanco +/- gentamicin)
  - **High Output Failure**

Dialysis Access Complications

Hemodialysis Complications (2)

- **Altered Mental Status**
  - Hypotension
  - Hypoglycemia
  - Hypercalcemia
  - Subdural hematoma
  - Dysequilibrium syndrome
    - Increased ICP from osmotic shifts during dialysis
    - Headache, nausea, confusion
    - *Diagnosis of exclusion*
    - Resolves spontaneously. Symptomatic Rx.
- **GI Issues**
  - GI bleeding, constipation and bowel obstruction are common

Peritoneal Dialysis

- Requires no heparin and occurs slowly (fewer acute complications)
- **Peritoneal infection is the most serious problem**

Symptoms: Abdominal discomfort , Fever
Pain during inflow

Diagnosis: Peritoneal fluid analysis
>100 WBCs/mm^3, >50% PMNs
S. epidermidis (#1)
S. aureus, *Strep*. and gram negatives

Treatment: Intraperitoneal antibiotics and lavage
IV antibiotics if systemically ill

Urinary Tract Infection (1)

- **Definition**
  - Symptoms plus as few as 100 CFUs (colony forming units) of a single pathogen
- **Relapse**
  - Same organism and serotype
  - Less than one month since the initial infection
- **Reinfection**
  - Different organism or serotype
  - One to six months after initial infection

Urinary Tract Infection (2)

	UNCOMPLICATED	COMPLICATED
Host	Young, healthy *non-pregnant* female	Everyone else
Pathogen	E.coli	Klebsiella Group D Strep Proteus Pseudomonas Enterobacter *Staph* spp
Work-Up	Do not culture	Culture +/- Follow-up studies
Treatment	3 days	10 days Empiric coverage to cover pseudomonas in high-risk patient

Urinalysis in UTIs

Nitrite test:

Specific but insensitive.

Based on bacterial metabolism of *nitrate* to *nitrite*

Leukocyte esterase:

Specific but insensitive.

Based on the presence of WBCs

Bacteriuria:

Any bacterium	(uncentrifuged)
>15/HPF	(centrifuged)

Pyuria:

>2-5 WBCs	(centrifuged, female)
>1-2 WBCs	(male)

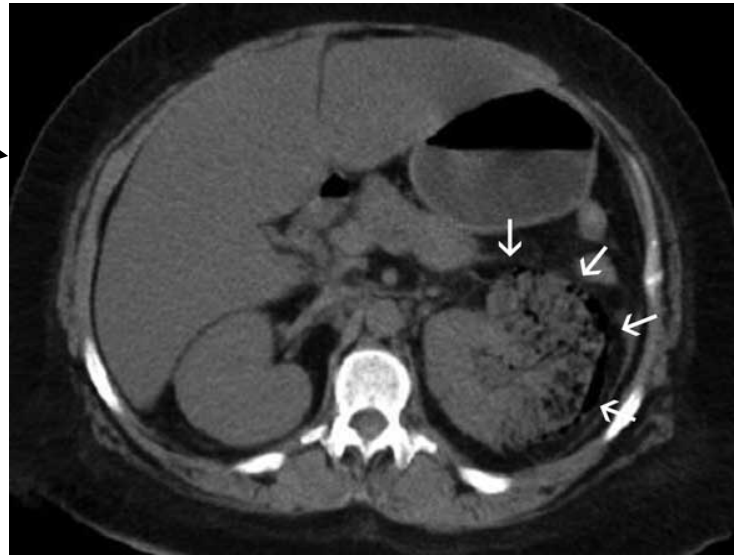
UTI Miscellaneous

- **Asymptomatic bacteruria**
  - Treat *only in pregnancy* to prevent pyelonephritis
- **Sterile pyuria**
  - Genitourinary TB (classic sterile pyuria)
  - Chlamydia (most common)
- **Acute urethral syndrome**
  - Sterile or low bacterial count with dysuria
  - Differential: Chlamydia, GC, HSV, vaginitis
  - Treatment: Empiric Rx of STDs

Pyelonephritis incidence is increased in the third trimester (may precipitate preeclampsia, sepsis and miscarriage)

Surgical Complications of UTI

- **Perinephric abscess**
  - Complication of UTI, from contiguous spread
  - Contrast with renal abscess or carbuncle, which is from hematogenous spread
- **Emphysematous pyelonephritis**
  - Occurs in diabetics
  - High mortality without drainage



Consider surgical complications in sick patients with pyelonephritis – especially in diabetics

Fournier's Scrotal Gangrene

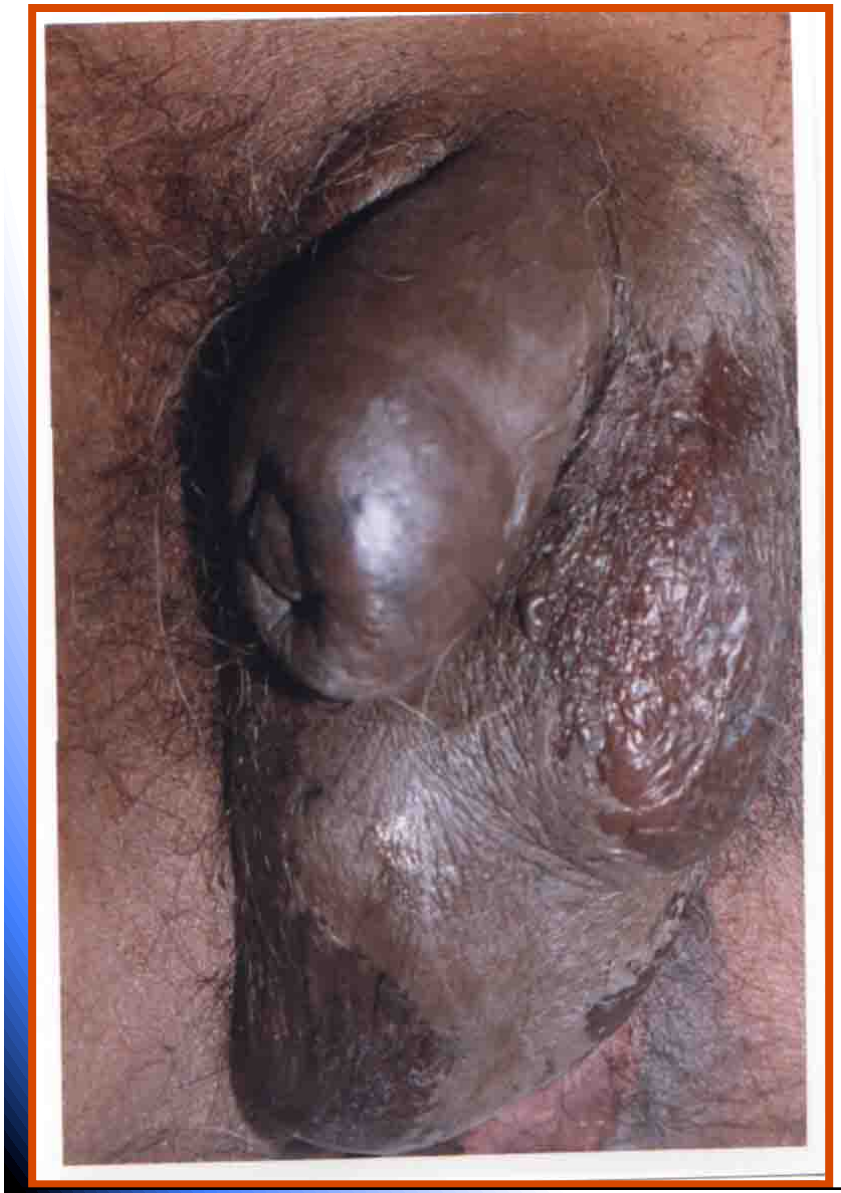
- Surgical emergency
- Polymicrobial
- More common in the immunocompromised
  - Alcoholic liver disease / cirrhosis
  - Diabetes
  - IV drug use
- Begins as benign infection (cellulitis, abscess)

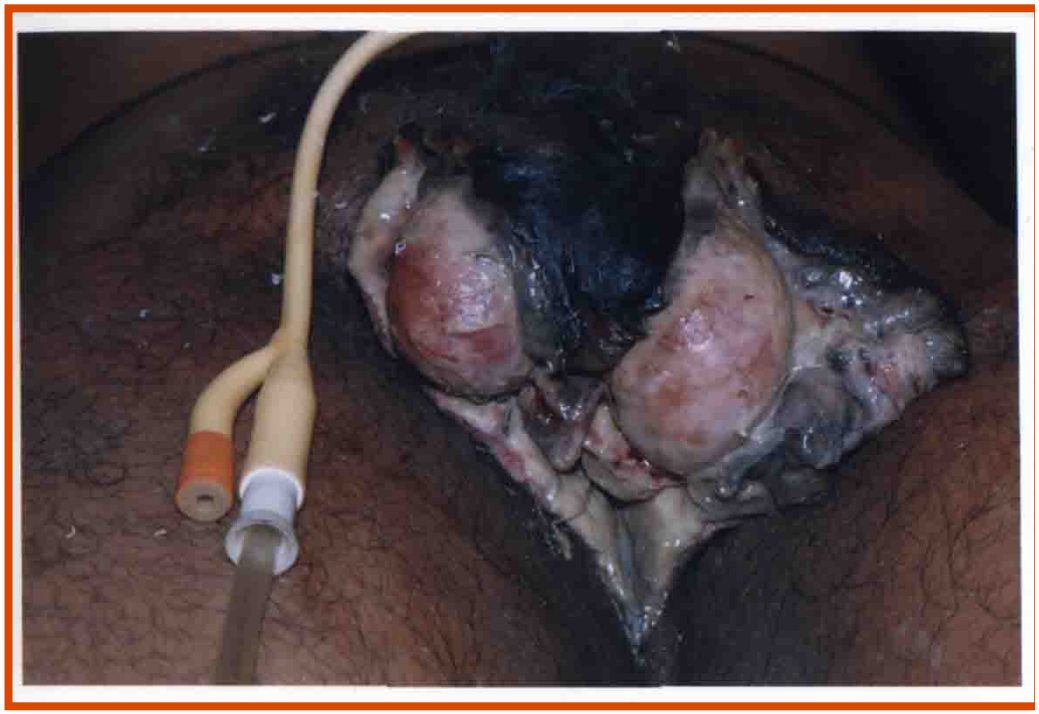
Consider Fournier's in any patient with scrotal, rectal or genital pain out of proportion to clinical findings

Fournier's Scrotal Gangrene

The Many Faces of Fournier's

The Many Faces of Fournier's





Necrotizing Soft Tissue Infections

Not Missing the Diagnosis

- Pain Out of Proportion (POOP) or indifference
- Vital sign derangements (esp. tachycardia)
- ↑↑↑ WBC count
- Low serum Na^+
- Blisters
- Odor
- Rapid change
- Skin appearance variable
- Subcutaneous air (crepitus)

Balanoposthitis

- Balanitis: glans penis
- Posthitis: foreskin
- Rule out diabetes
- Treatment
  - Local measures (soap and water, keep dry)
  - Topical bacitracin (peds)
  - Topical clotrimazole (adults)

Balanoposthitis

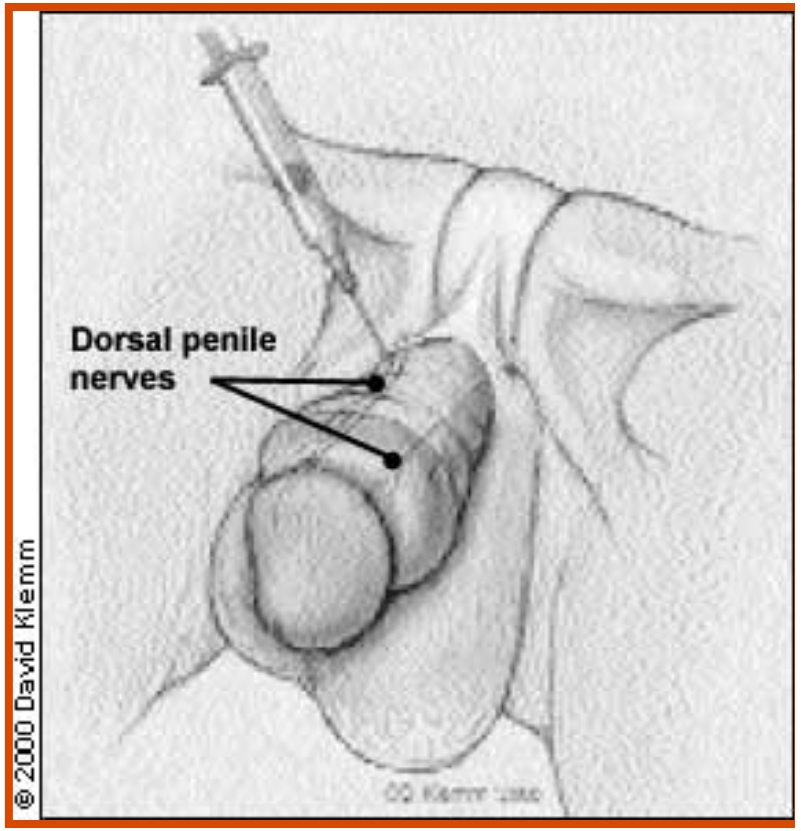
Candidal balanitis

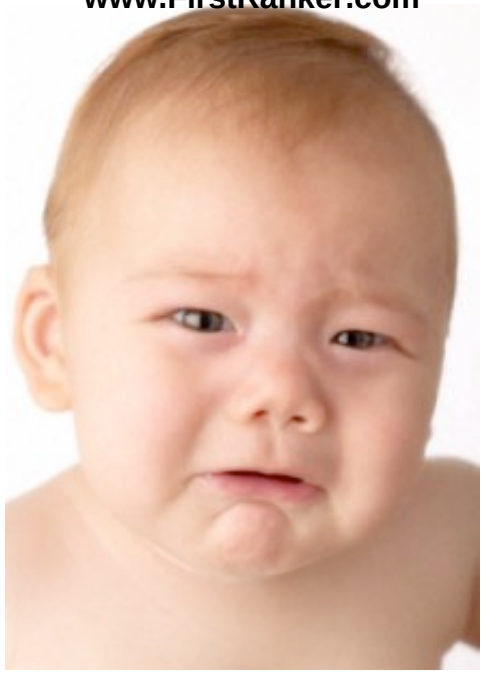
Candidal balanitis

Phimosis / Paraphimosis

	PHIMOSIS	PARAPHIMOSIS
	Rarely emergent	Emergency
Definition	Unable to retract foreskin	Retracted foreskin
Complication	Urinary retention (Rare)	Necrosis of glans
Treatment	Dilation of preputial ostium (*if retention only*)	Compression & dorsal incision

Paraphimosis and Its Treatment





Penile Hair Tourniquet

- Constricting hair band
- In DDx of persistently crying boy (2-5 y.o)
- Hair may be buried in coronal ridge due to edema

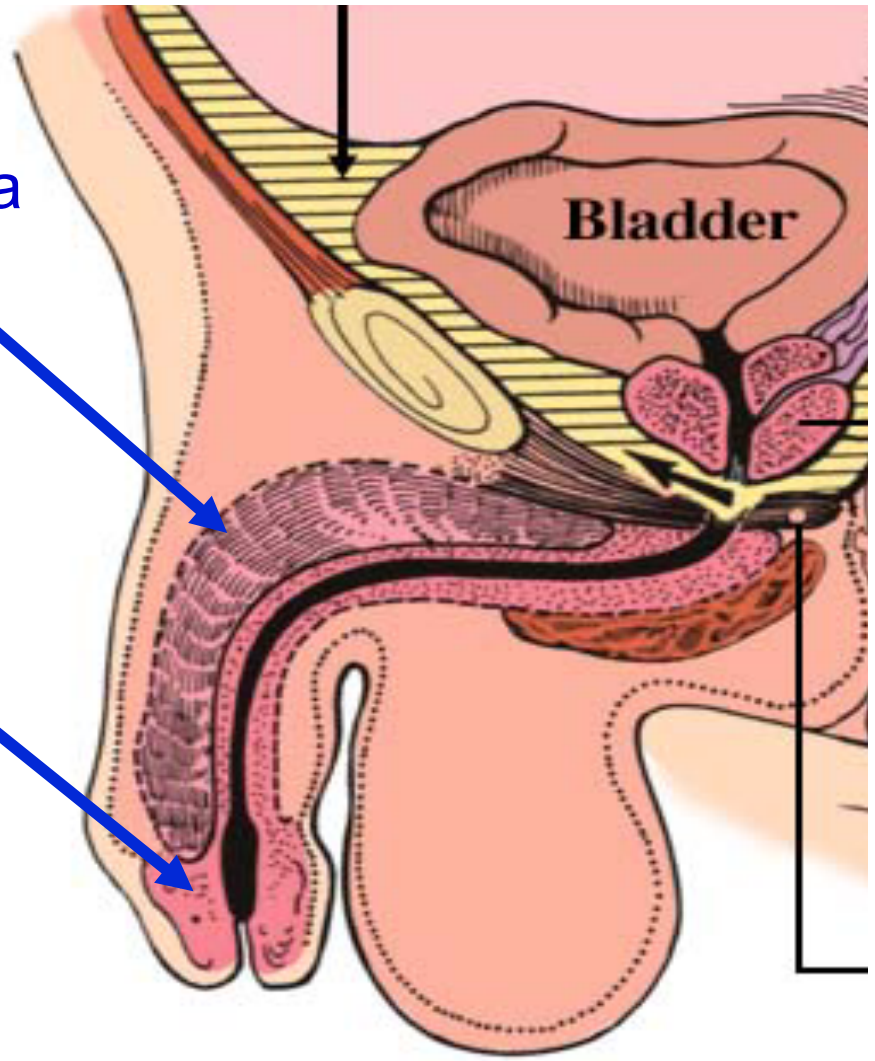
Fractured Penis

- During intercourse
- Rupture of tunica albuginea
- Hematoma formation, may involve urethra
- Surgical management

Priapism (1)

Pathologic erection

- Involves both corpora cavernosa
  but not
  glans or **corpus spongiosum**



Complications

- Urinary retention
- Impotence

Priapism (2)

Two Forms / Causes

- **Low-flow priapism (ischemic)**
  - Sickle cell or other hematologic diseases
  - Intracavernosal injections
  - Drugs (phenothiazines, SSRIs, Viagra et al., neuroleptics)
  - Spinal cord injuries
- **High-flow priapism (arterial injury)**
  - Trauma (straddle mechanism)

Priapism (3)
Treatment

- Low flow

  Basic treatment is the same for all causes
  - Terbutaline subcutaneously or locally
  - Corporal aspiration and irrigation
  - Phenylephrine injection into corpora
  - Specific hematologic Rx (e.g. transfusion for sickle cell disease)
  - Surgery (placement of shunt)

- High flow

  Embolization or surgery

Penile Lesions – Syphilis (1)

- *Treponema pallidum*
- **Primary infection**
  - *Painless chancre* (arrives 21 days after contact and lasts 4-6 weeks)
  - Indurated borders
  - No constitutional symptoms
  - Minimal adenopathy
  - Dx: dark field microscopy, RPR, FTA-ABS
  - Serology usually negative first 4-6 weeks
- **Treatment**
  - 2.4 million units benzathine penicillin G IM
  - Anticipate Jarisch-Herxheimer reaction (slide 56)

Chancre (primary syphilis)

Penile Lesions – Syphilis (2)

- **Secondary Syphillis**
  - 6-8 weeks after primary infection
  - Most infectious phase of syphillis
  - Rash on palms, soles, trunk
  - Lesions contain spirochetes
  - In moist areas the lesions are flat = condyloma lata

Secondary Syphilis

Penile Lesions – Syphilis (3)

- **Jarisch-Herxheimer reaction**
  - Antibiotic treatment causes organism death and the release of endotoxins
  - Fever, chills, headache, myalgia, rash
  - Comes on 2-6 hours after the onset of treatment
  - Lasts a few hours
  - Occurs in 50% of cases of primary syphyllis (90% of secondary cases)
  - Treat with acetaminophen two hours before and after antibiotic treatment

Penile Lesions - Herpes

- Herpes simplex virus (HSV-1 or HSV-2)
- **Primary Infection**
  - Constitutional symptoms
    - Headache, fever, myalgias
  - Painful blisters, pustules or ulcers
  - Lymphadenopathy
  - Complications
    - Urinary retention
    - Aseptic meningitis (HSV-2)
- **Treatment**: acyclovir 200 mg 5x/day for 10 days

Penile Lesions - LGV

- Lymphogranuloma venereum (LGV)
- *Chlamydia trachomatis*
- Urban outbreaks in the U.S.
- **Primary infection**
  - Primary lesion: painless herpes-like ulcer
  - Inguinal “buboes” (enlarged nodes), groove sign
- **Treatment**: doxycycline x 3 weeks

Lymphogranuloma venereum (LGV)

LGV

Ulcerated Bubo

Groove sign

Penile Lesions - Chancroid

- *Haemophilus ducreyi*
- Rare in U.S.
- **Primary infection**
  - Tender papule followed by painful ulcer (multiple lesions may be present and coalesce)
  - Painful inguinal adenopathy (buboes)
- Culture!
- Treatment: azithromycin or ceftriaxone (single dose treatment with either agent)

Chancroid

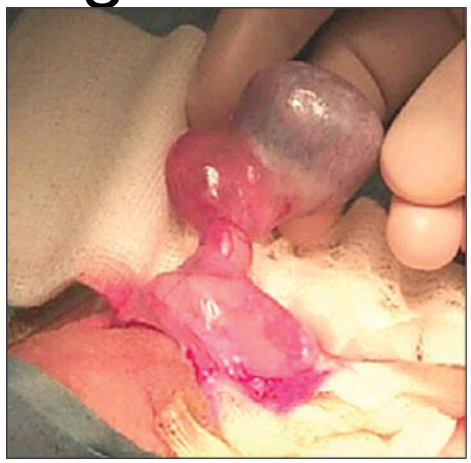
Penile Lesions – Granuloma Inguinale

- *Calymmatobacteruim granulomatis (Donovaniasis)*
- Rare in U.S.
- Presentation
  - Chronic painless progressive ulcers and vascular granulomata
  - Multilating
  - No inguinal adenopathy
- Biopsy! (Donovan bodies)
- **Treatment**: doxycycline x 3 weeks

Granuloma Inguinale

Testicular Torsion (1)

- Peak incidence in puberty
- Bell clapper deformity - bilateral: testis is free to swing and rotate inside the tunica vaginalis
- Presentation
  - Sudden onset of testicular pain
  - Testicle is elevated; horizontal lie
  - Cremasteric reflex *usually* absent
  - Prehn's sign *usually* absent (relief of pain by scrotal elevation – a sign of epididymitis)



Consider torsion in any young male with abdominal pain

Testicular Torsion (2)

- **Treatment**

Manual detorsion

- Detorse medial-to-lateral (like opening a book when viewed from the feet)
- Relief of pain, normal lie indicates success
- If unsuccessful, try opposite direction
- High salvage rate if detorsed within 6 hours, high loss rate after 8 hours

Emergency Surgery

- Bilaterally orchidopexy

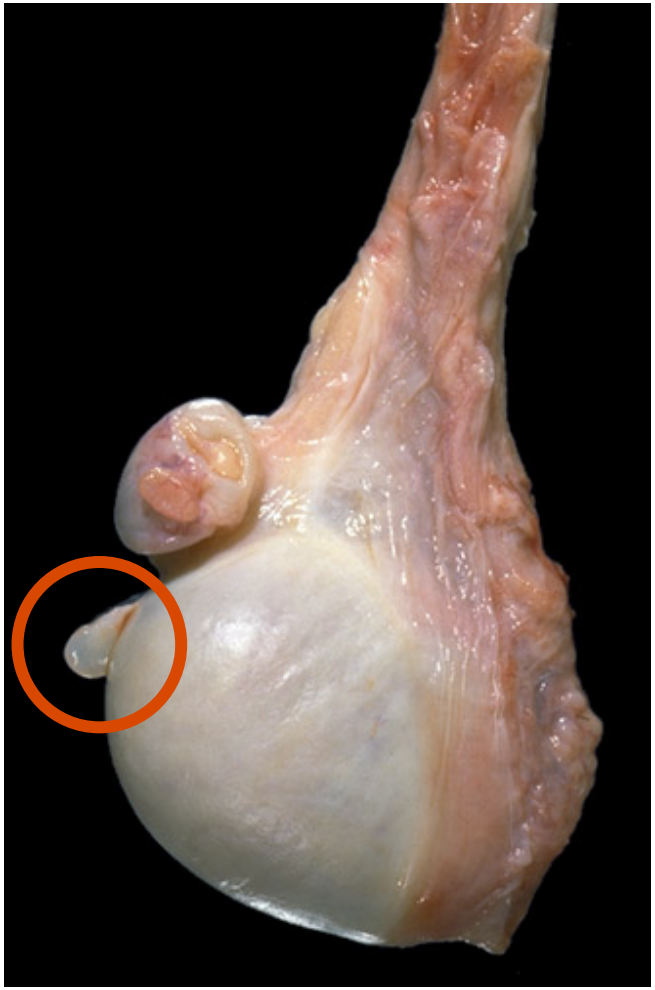
CALL THE UROLOGIST STAT – then do the U/S or nuclear scan!

Testicular Appendage Torsion

- Twisting of *appendix* testis or other “non-essential” structures
- More common in prepubertal boys
- Blue dot sign: Necrotic appendages visualized through scrotum
- Surgery is not necessary

  if diagnosis is unequivocal

  (normal color Doppler of testis)

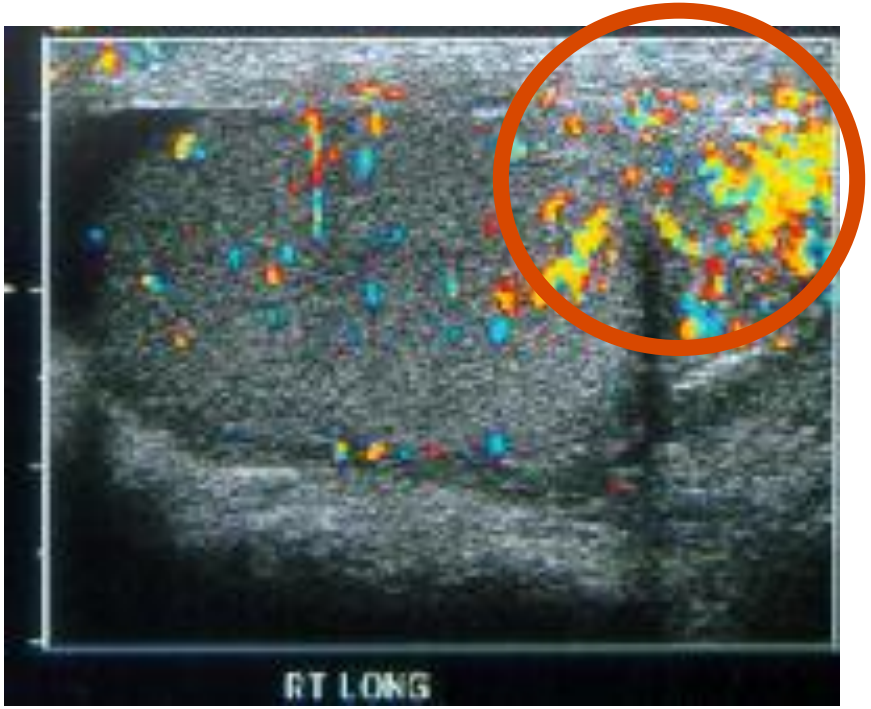


Epididymitis (1)

- **Causes**
  - Infection (age-related etiology)
  - Inflammation (e.g. urine reflux)
- **Presentation**
  - Can mimic torsion but usually gradual onset of pain
  - *Cremasteric reflex* usually present (stroking the inner thigh causes retraction of the scrotum and testicle)
  - *Prehn's sign* usually present (relief of pain on lifting the testicle) (Ischemic pain of torsion not relieved by lifting)
- **Age-related factors**
  - *Young boys*: Consider structural abnormality / E. coli
  - *Sexually active*: Usually STD-related (Chlamydia/GC)
  - *Older patients*: Think obstruction, prostatism / E.coli

Epididymitis (2)

- **Diagnosis**
  - Urine frequently positive for bacteria, WBCs, nitrites
  - Increased flow on color Doppler (U/S)



- **Treatment**
  - Antibiotics to cover age-specific causes
  - NSAIDs
  - Intermittent ice packs, scrotal support

Acute Prostatitis

- **Causes**
  - Same etiologies as epididymitis
  - Similar age-related considerations
- **Presentation**
  - Perineal pain, dyschezia, frequency, dysuria, fever, chills, urinary retention
  - Boggy, enlarged, tender prostate
- **Treatment**
  - Acute: ***Prostate massage, Foley contraindicated***
    Suprapubic drain PRN
    IV Antibiotics
  - Chronic: Long term outpatient antibiotics

Urethritis

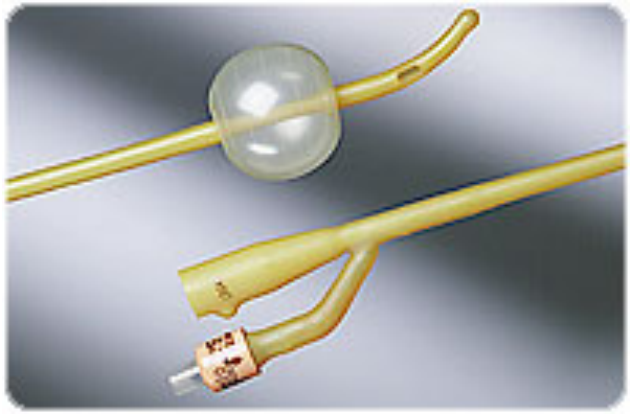
- **Gonococcal**
  - White discharge
  - Gram negative intracellular diplococci
  - Treatment: ceftriaxone 250mg IM
  - Treat for Chlamydia as well

- **Non-Gonococcal**
  - Watery or no discharge
  - Few findings on smear
  - Chlamydia, HSV, Trichomonas, Ureaplasma,
  - Treatment: azithromycin (1g x single dose)
    doxycycline (100 mg BID x 10 days)

Consider HIV/syphilis and treat partners

Urinary Retention

- **Causes**
  - Mechanical
    - Prostatic hyperplasia (most common), meatal stenosis, urethral stricture
  - Neurologic
    - Spinal cord injury, MS, diabetes
- **Drugs are a key precipitant/exacerbating factor**
    - OTC sympathomimetics (e.g. cold remedies)
    - TCAs, anticholinergics, antihypertensives
    - Opioids
- **Treatment**
  - Coudé catheter if BPH suspected
  - DO NOT attempt filiform and followers
  - Suprapubic drainage if cannot pass catheter and no urologist available
  - Discharge with catheter in place



Coudé catheter

Non-traumatic Hematuria (1)

- Definition: >5 RBC's/hpf

When during urination?	On Initiation At end Throughout Cyclic	Bladder/Urethra Prostate Renal Endometriosis
Color? Consistency?	Brown Clots	Renal Post-renal
Associated Hx	Recent Infection Multisystem disease Drugs	Renal (Renovascular, GN, AIN)

Non-traumatic Hematuria (2)

AGE	Common CAUSES
<20 years	Glomerulonephritis UTI
20-40 years	Stone UTI Carcinoma
>40 years	**Carcinoma** Stone UTI
>60 years (male)	Prostatism Carcinoma

Kidney Stones (1)

STONE TYPE (INCIDENCE)	CAUSES	NOTES
Calcium oxalate (75%)	Most related to diet IBD (UC and Crohn's) Hyperparathyroidism	Male predominance Warm & dry climates
Struvite ($Mg\text{-}NH_4\text{-}PO_4$) (15%)	Chronic Infection (Proteus, pseudomonas)	Staghorn formation High pH (>7)
Uric acid (10%)	Gout Congenital	Radiolucent Low pH (<6)
Cysteine (1%)	In-born error	Staghorn formation Renal failure
Indinivir (<1%)	Indinivir therapy (protease inhibitor)	HIV or post-exposure prophylaxis patients

Kidney Stones (2)

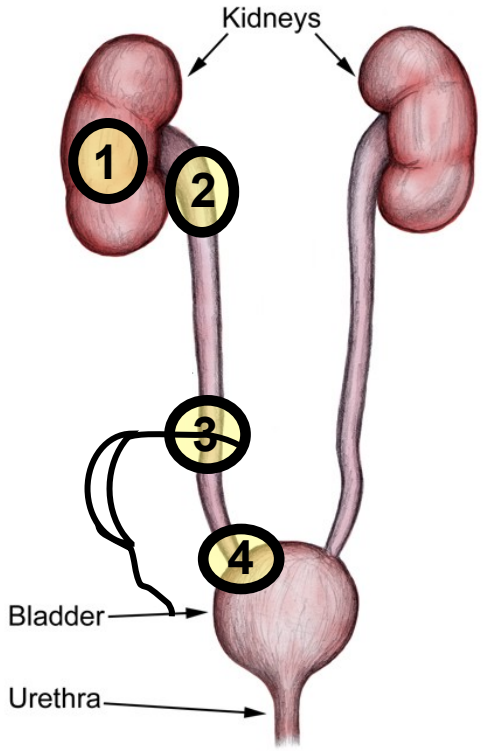
Common areas of impaction

1 Renal calyx

2 Ureteropelvic junction (UPJ)

3 Pelvic Brim

4 Ureterovesical junction (UVJ)



UVJ is the most common site of impaction

Kidney Stones Diagnosis

Hematuria may be absent in 10-20%

Diagnostic Mimics

- Critical DDx includes: **AAA**
  Testicular torsion
  Ectopic pregnancy
  Appendicitis
  Incarcerated hernia
  Biliary colic

Renal colic is the most common misdiagnosis in cases of **abdominal aortic aneurysm**

Kidney Stones Treatment

- **NSAIDs**
  - Avoid in congenital stones, any history of renal failure, bilateral stones
- **Opioid Narcotics**
- **Hydration**
  - Fluid boluses increase pain, not helpful
- **ECSWL (lithotripsy)**
- **Percutaneous lithotomy, retrograde lithotomy**
- **Open Surgery**

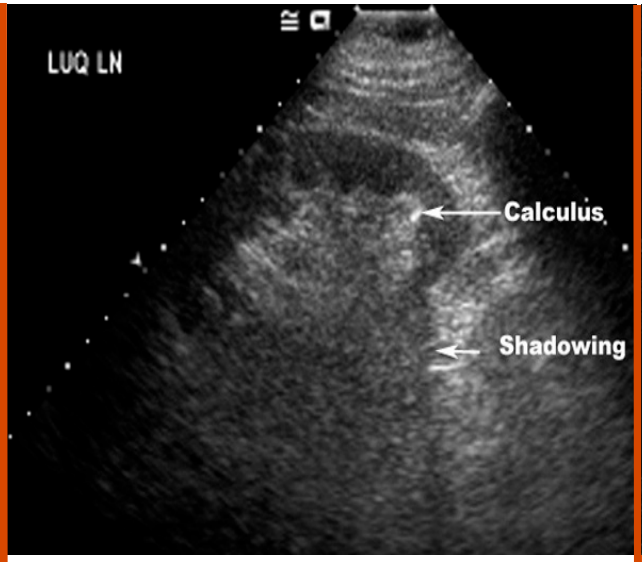
Stone Admission Indications

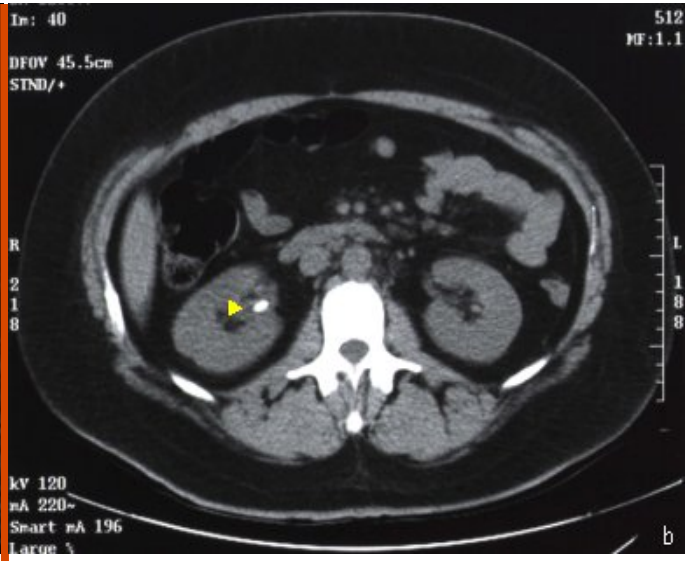
- Concurrent infection
- Concomitant renal insufficiency
- Solitary kidney with complete obstruction
- Uncontrolled pain or intractable vomiting
- Ruptured renal capsule

Stone Passage

- 5 mm pass 50% of time
- >6 mm pass 10% of the time
- 1 cm stones do not pass)

Stone Imaging





Plain films-KUB

Not sensitive

Not specific

Ultrasound

Not sensitive

More specific

For - pregnant ♀

- repeat imaging

Non-contrast CT

New Gold Standard

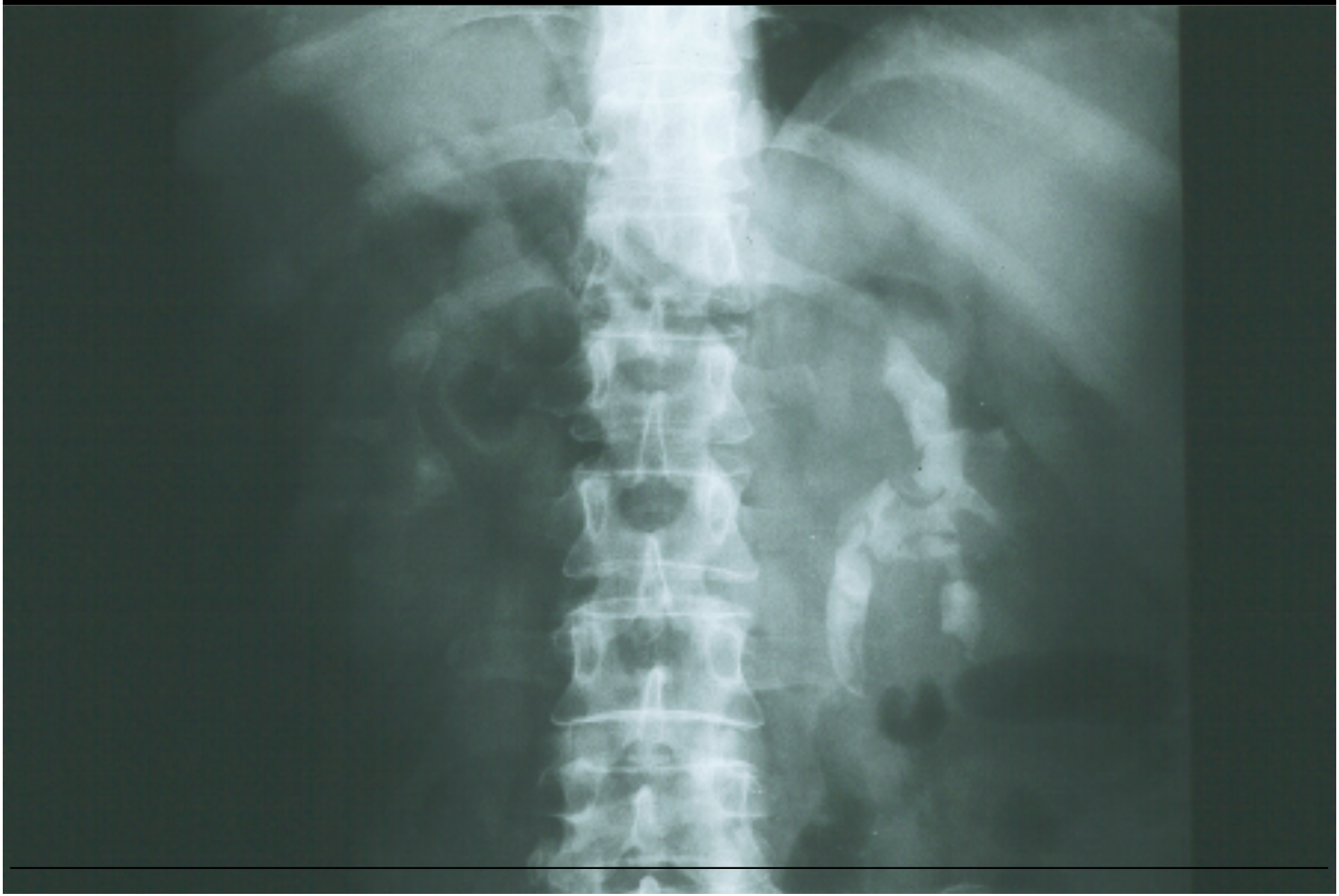
Sensitive

Most specific

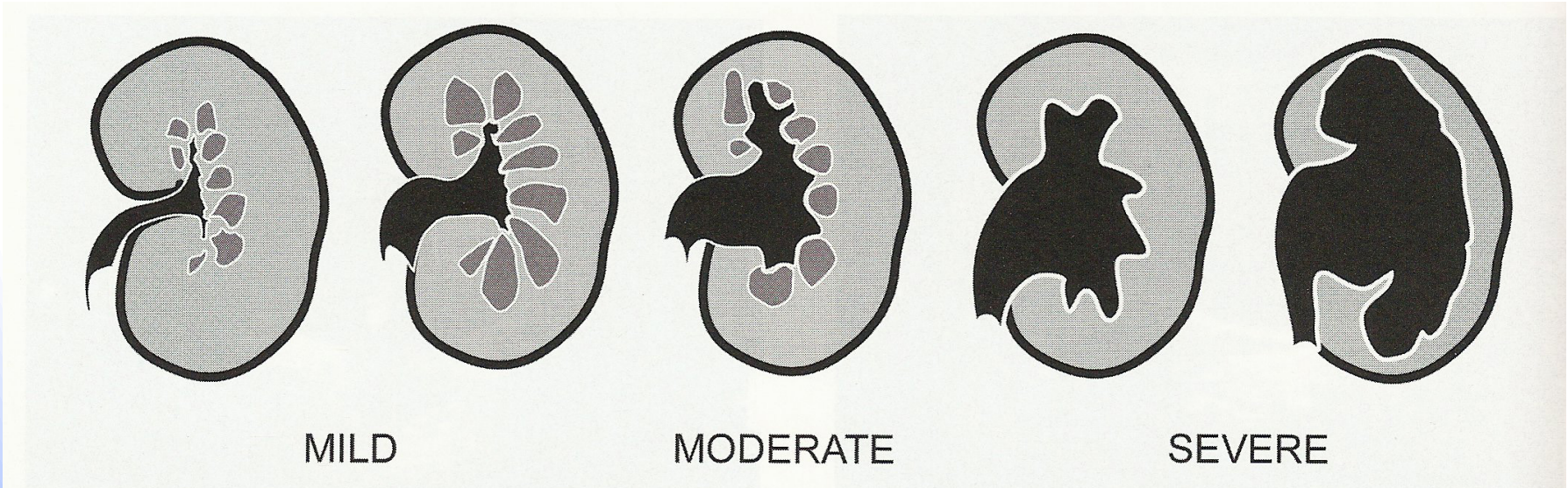
No info on function

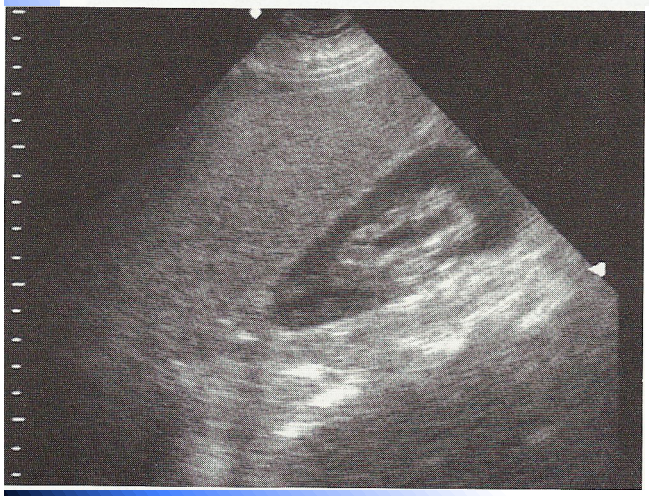
(need IVP or CT urogram)

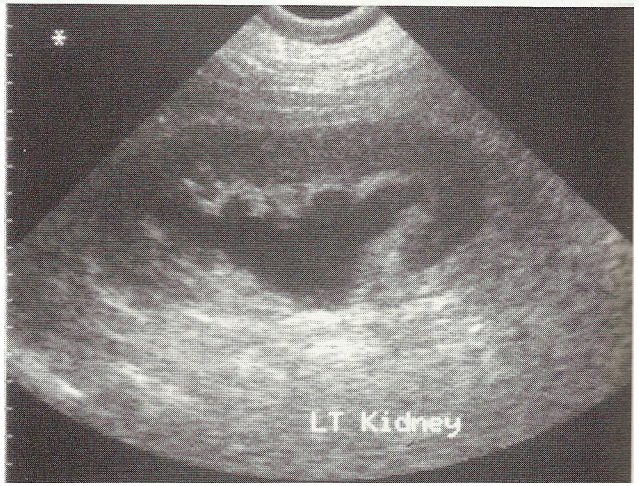
Staghorn Calculus on Plain Film (KUB)

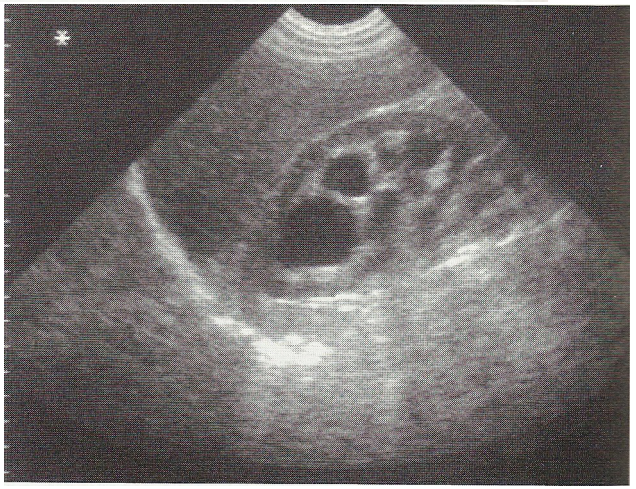


Renal U/S: Hydronephrosis

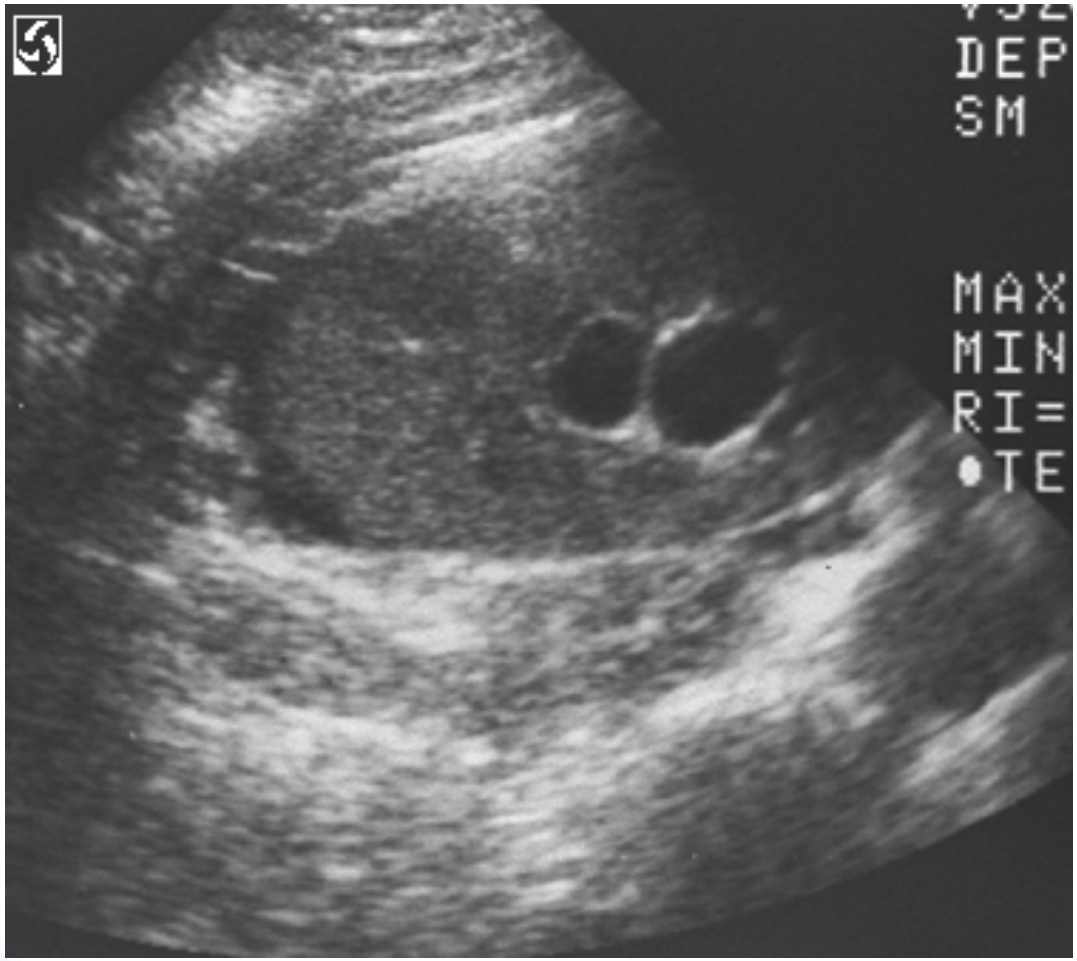




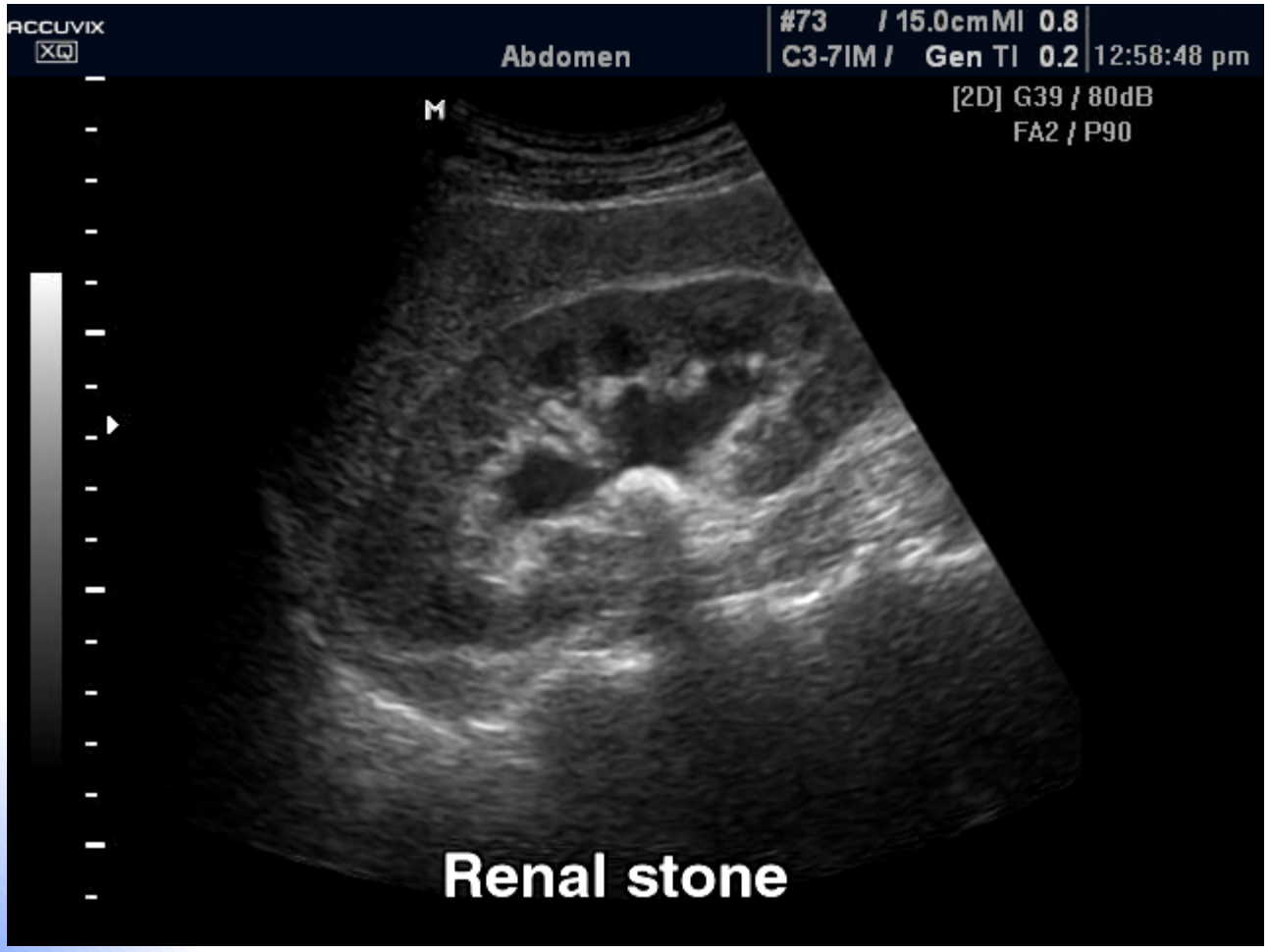




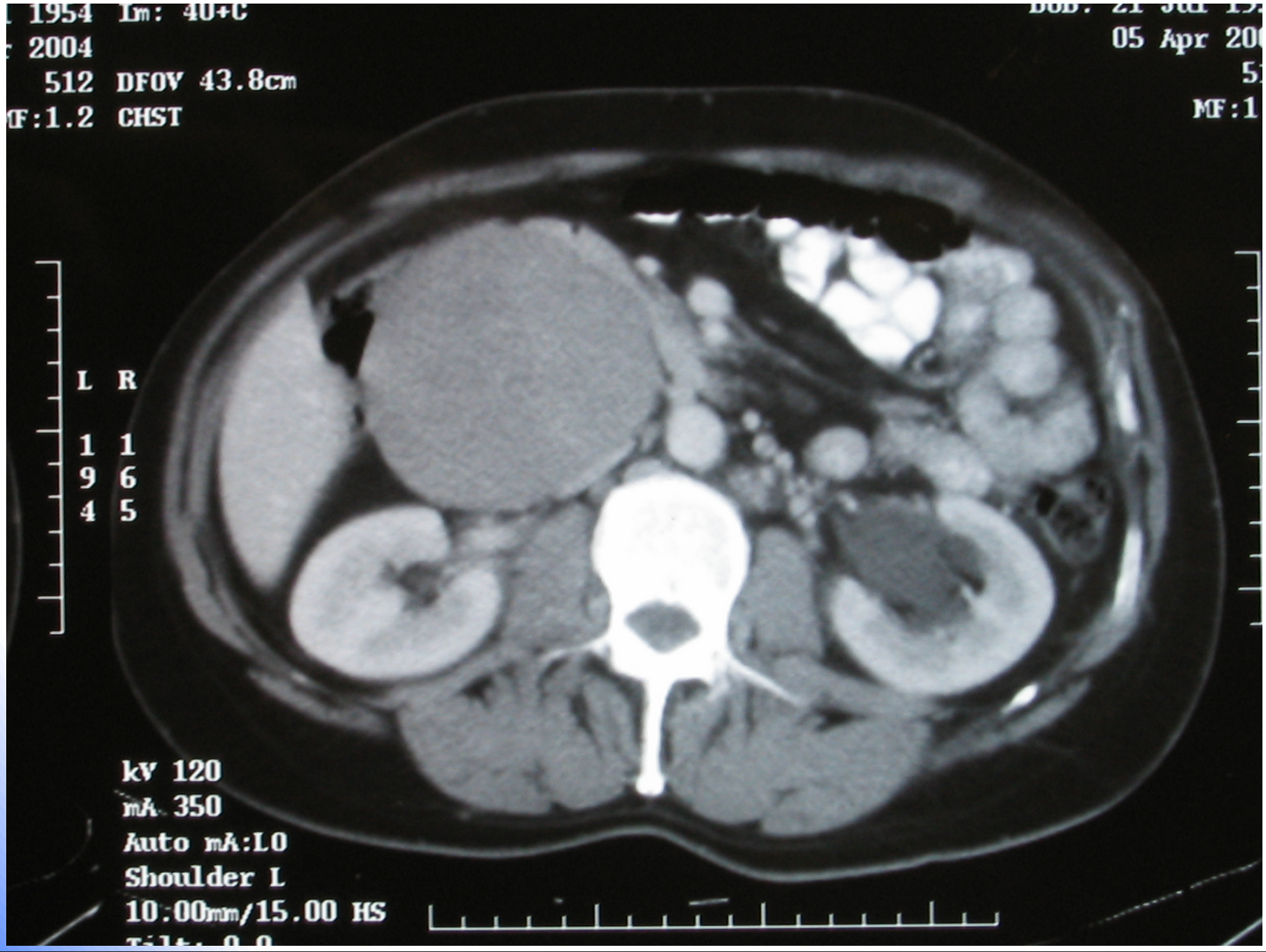
Renal U/S:
Ruptured Renal Capsule



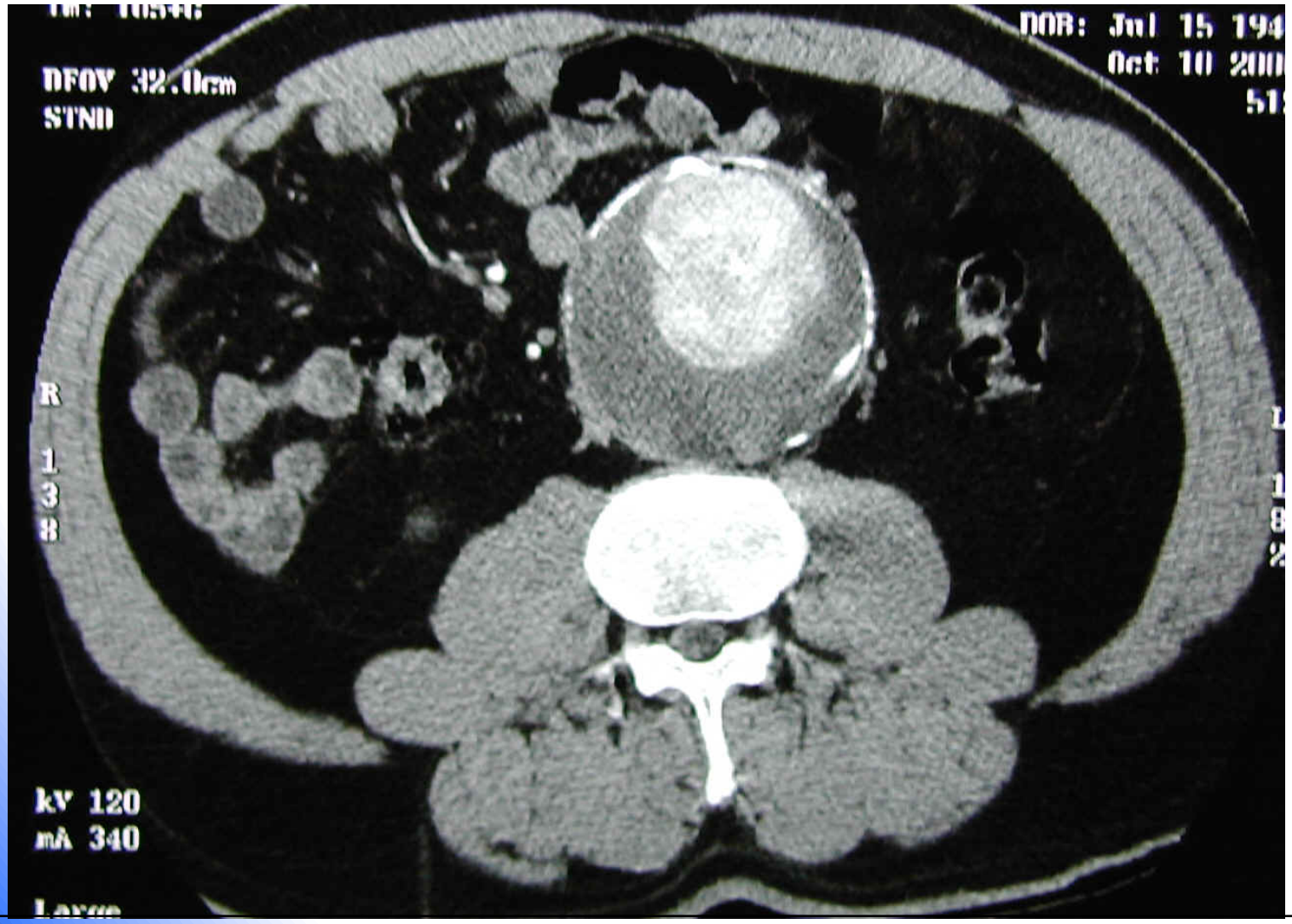
Renal US:
Large Stone in Renal Pelvis



CT: Hydronephrosis



CT:
Ruptured Abdominal Aortic Aneurysm



Renal Transplant Tidbits

- Most common solid organ transplant
- Transplant location: retroperitoneal in pelvis
- Hepatitis C is very common
- Patients receive azathioprine, cyclosporine and prednisone
- Cyclosporine is nephrotoxic

Infection and Rejection

Can be subtle clinically

Any rise in creatinine is cause for alarm

Consult transplant team

NEPHROLOGY QUESTIONS

Which of the following is a pre-renal cause of renal failure?

A. CHF
B. Acute tubular necrosis
C. Renal papillary necrosis
D. Glomerulonephritis
E. Nephrolithiasis

A 25 y/o presents with a 3 week history of lower extremity edema and fatigue. U/A: Massive proteinuria. Which of the following is the most likely diagnosis?

A. Familial hyperlipidemia
B. Hereditary angioedema
C. Thrombotic diathesis
D. Nephrotic syndrome
E. Guillain Barre syndrome

NEP 2

Which is true regarding diabetes insipidus?

A. The least common drug-related cause is lithium
B. In nephrogenic DI, the kidney responds to exogenous infusion of ADH
C. The urine is typically very dilute
D. Head trauma is not a common cause
E. Results from increased secretion or response to ADH

A 30 y/o dialysis patient presents with a decreased blood pressure, distended neck veins, distant heart sounds and equal lung sounds. A low-grade fever is present. What is the most likely cause?

A. Congestive heart failure
B. Tension pneumothorax
C. Pulmonary embolism
D. Pericardial effusion
E. Dressler's syndrome

A dialysis patient who missed her last treatment has a bradyasystolic cardiac arrest. Which of the following would be most beneficial during her resuscitation?

A. Potassium
B. Magnesium
C. Phosphorus
D. Calcium
E. $NaHCO_3$

Which of the following penile lesions is classically described as painless?

A. Herpes simplex
B. Chancroid
C. Herpes zoster
D. Chancre
E. Inguinal bubo

Which of the following is consistent with renal transplants?

A. The least common solid organ transplanted
B. Hepatitis C is uncommon
C. Cyclosporine is contraindicated
D. Corticosteroids are contraindicated
E. Cyclosporine is nephrotoxic

A dialysis patient is brought to the ED with a sudden, severe headache with vomiting. What is the likely cause of the patient's chronic renal failure and subarachnoid hemorrhage?

A. Acute tubular necrosis
B. Diabetes
C. Polycystic kidney disease
D. Aminoglycoside toxicity
E. Hypertension

A 30 y/o patient is suspected of having epididymitis. The usual etiology is:

A. Chlamydia trachomatis
B. Urethritis from non-oxyl-9
C. E. coli
D. Klebsiella
E. Bacteroides fragilis

Which of the following is a true statement regarding imaging studies for ureteral stones?

A. The IVP demonstrates function and anatomy
B. Contrast reactions and nephrotoxicity are more likely to occur with non-ionic vs. ionic contrast
C. Patients who are dehydrated, hyperglycemic, over the age of 70 and with pre-existing renal disease are good candidates for IVPs
D. Total obstructions induced by ureteral stones >6mm are poorly visualized on ultrasonography
E. Ultrasound is the gold standard in renal stone imaging

Which of the following statements is true regarding ureteral stones?

A. They are more common in females than males
B. Most uric acid stones are radiopaque
C. Ureteral stones are less common in warmer climates
D. Few stones > 6 mm will spontaneously pass
E. The UPJ is the most common location of obstruction

Regarding dialysis-associated problems, which of the following is true?

A. First-use syndrome is manifested by hypertension from an anaphylactoid reaction to a new dialyzer

B. Dialysis-related dysequilibrium is treated with corticosteroids

C. Hypokalemia is the most common cause of dialysis-related bradyasystolic cardiac arrest

D. Hyperkalemia in dialysis patients can be initially treated with IV calcium gluconate.

E. "Dialysis dementia" responds to increasing the frequency of treatments

Which of the following is the most common cause of painless, gross hematuria in patients over 40 years of age?

A. Vigorous exercise
B. Kidney / bladder stones
C. GU tumors
D. Bleeding disorders / coagulopathies
E. Foley catheter insertion

Which of the following statements is true regarding acute epididymitis?

A. A positive Prehn's sign is relief of scrotal pain with rotation of the testes
B. Pain relief on elevation of the testes is considered suggestive of epididymitis rather than testicular torsion
C. Epididymitis is most common in young prepubertal males
D. The etiologic agent is unrelated to the patient's age
E. Is always caused by infection

A 14 y/o presents with an acute onset of scrotal pain. He is diagnosed with testicular torsion. Which of the following is accurate, regarding this patient's diagnosis?

A. There is an 80-100% salvage rate if detorsed within 24 hours
B. Manual detorsion generally involves rotating the testes from medial to lateral
C. Peak incidence is 6 years
D. A testicle in torsion usually lies vertically
E. Abdominal pain is rare

Which of the following is true regarding priapism?

A. This is a pathologic erection involving the glans and corpora spongiosum
B. SQ epinephrine is used to treat most reversible causes
C. Exchange transfusions may be necessary for those caused by sildenafil (Viagra)
D. Most etiologies are veno-occlusive, as opposed to arterial
E. The basic treatment varies, dependant on the cause

Which of the following statements, regarding general urology, is true?

A. Balanitis is an inflammation of the foreskin
B. Posthitis is an inflammation of the glans penis
C. Phimosis is a common cause of urinary retention
D. Paraphimosis can be a true urologic emergency
E. The typical age for a penile hair tourniquet is 3-7 years

NEP 17

Which of the following statements is true regarding Fournier's gangrene?

A. Penicillin is generally adequate treatment
B. It typically begins as a benign abscess and slowly develops into a more serious infection
C. It should be considered in any patient with scrotal, rectal or genital pain out of proportion to their clinical findings
D. I&D in the ED is usually adequate therapy
E. Antimicrobials are unnecessary after surgical debridement

Which of the following drugs will not worsen contrast induced nephropathy ?

A. Ibuprofen
B. Furosemide
C. Enalapril
D. N-acetylcysteine
E. Naproxen

Which of the following is a cause of rapidly progressive glomerulonephritis?

A. Chronic, controlled hypertension
B. Pyelonephritis
C. Lupus
D. Toxic alcohol overdose
E. Diabetic neuropathy

Nephrology Answer Key

1. A	11. D
2. D	12. D
3. C	13. C
4. D	14. E
5. D	15. B
6. D	16. D
7. E	17. D
8. C	18. C
9. A	19. D
10. A	20. C