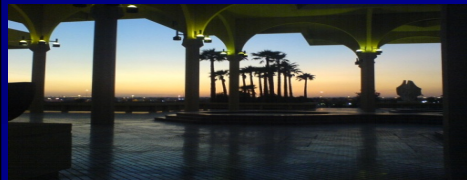


Urinary Tract Infections

Renal Stones



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18-10-2020



جامعة
الملك سعود
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Lectures Objectives

Urinary Tract Infections (UTIs)

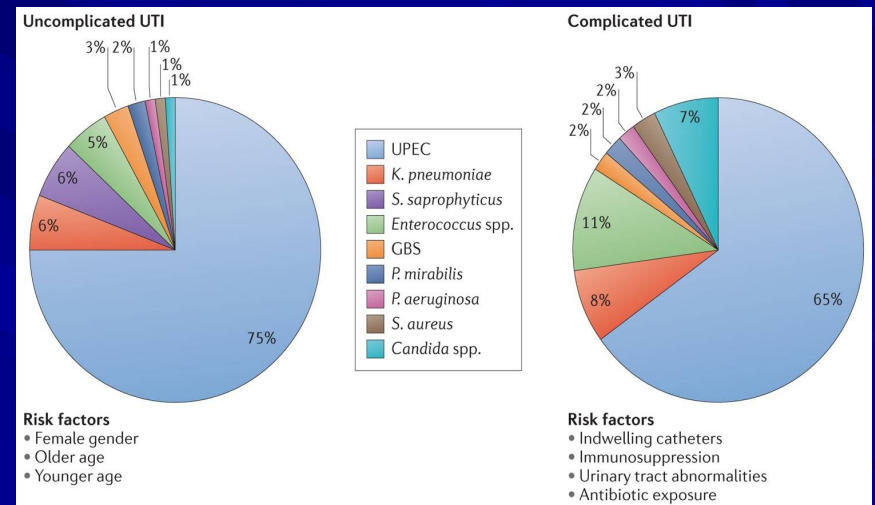
- *Approach to common urologic infections.*
 - *Emphasis on growing resistance of UTIs.*
 - *Clinical presentation of common UTIs*
 - *Management of UTIs*
-
-

Stones

- *Pathophysiology and epidemiology of urolithiasis*
- *Types of common kidney stones*
- *Clinical presentation of Kidney stones*
- *Medical and surgical management*

UTI

- Urinary tract infections (UTIs) are severe public health problems
- Most common:
 - *Grave –ve Bacteria* (*Escherichia coli*)
 - *Enterococcus faecalis*
- Increasing problems due to:
 - High recurrence rates
 - ↑ Antimicrobial resistance



UTI

■ Definitions

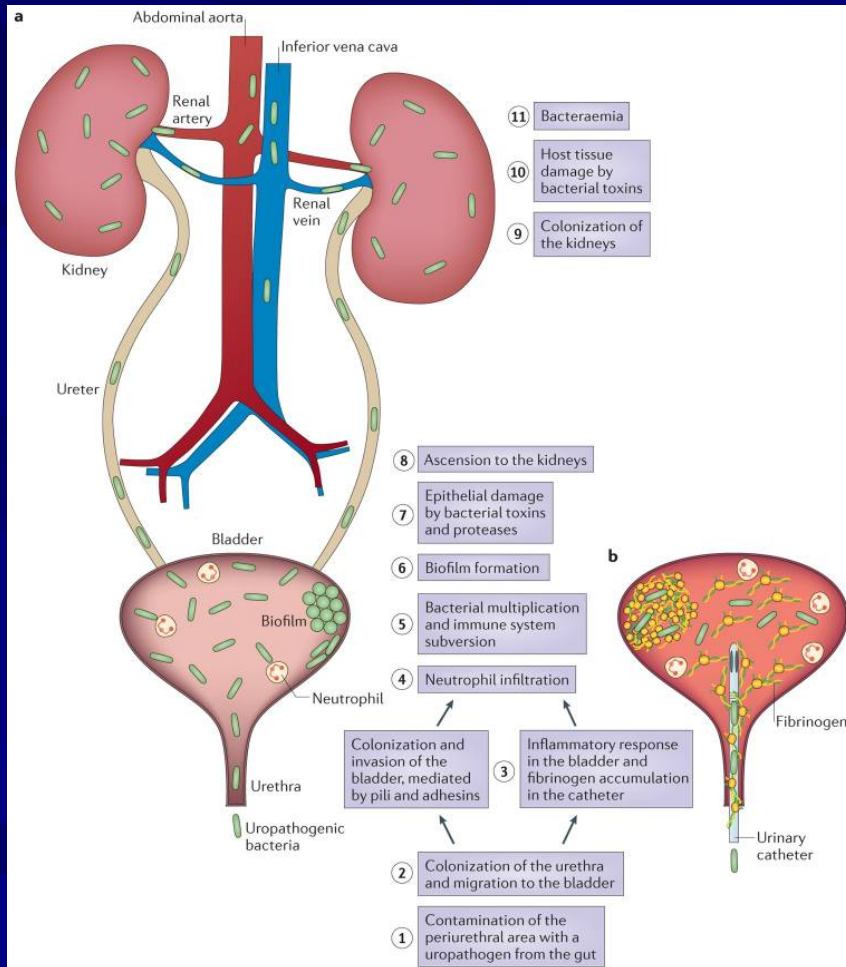
– *Bacteriuria*

- *Symptomatic*
- *Asymptomatic*

– *Pyuria*

- Presence of white blood cells in the urine
- Infection / inflammatory
- Bacteriuria without pyuria is indicative of bacterial colonization without infection
- *Pyuria without bacteriuria*
 - TB
 - Stones
 - Cancer

Routes of infection



■ Ascending Route

– Most common

■ Hematogenous Route

– uncommon

– Staph bacteremia (oral sites /Candida fungemia)

■ Lymphatic Route

– Rare

– Bowel obstruction inflammation

UTI

■ Uncomplicated

- Healthy patient
- No Anatomic or neurological GU abnormality

■ Complicated

- Ureteric obstruction (stone, stricture)
- Urinary retention
- ↓ immune system (Renal failure, Transplant)
- Foreign body (catheter)

Urinary tract infections

- Urethritis
- Epididymitis/orchitis
- Prostatitis
- cystitis
- Acute Pyelonephritis
- Chronic Pyelonephritis
- Renal Abscess

URETHRITIS

■ S&S

- urethral discharge
- burning on urination
- Asymptomatic

■ **Gonococcal vs. Nongonococcal**

DX:

- incubation period(3-10 days vs. 1-5 wks)
- Urethral swab
- Serum: Chlamydia-specific ribosomal RNA

URETHRITIS

Table 17-1. CLASSIC URETHRITIS

	Gonorrhea	Chlamydia
Organism	<i>Neisseria gonorrhoeae</i>	<i>Chlamydia trachomatis</i>
Organism type	Gram-negative diplococci	Intracellular facultative anaerobe
Incubation period	3-10 days	1-5 wk
Urethral discharge	Usually profuse, purulent	Usually scant
Asymptomatic carriers	40%-60%	40%-60%
Diagnostic test	Ligand chain reaction	Polymerase/ligand chain reaction
Other tests	Gram stain Culture	Culture Immunoassay
Recommended treatment	Ceftriaxone 125 mg IM once <i>plus</i> Azithromycin 1 g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days	Azithromycin 1g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days
Alternative treatment	Cefixime 400 mg PO <i>or</i> Ciprofloxacin 500 mg PO <i>or</i> Ofloxacin 400 mg PO <i>plus</i> Azithromycin 1 g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days	Erythromycin 500 mg PO qid 7 days <i>or</i> Erythromycin ethylsuccinate 800 mg PO qid × 7 days <i>or</i> Ofloxacin 300 mg PO bid × 7 days

Epididymitis

- Acute : pain, swelling, of the epididymis <6wk
- chronic :long-standing pain in the epididymis and testicle, usu. no swelling.
- DX
 - Epididymitis vs. Torsion
 - U/S
 - Testicular scan
 - Younger : *N. gonorrhoeae* or *C. trachomatis*
 - Older : *E. coli*

Epididymitis

Table 17-3. TREATMENT OF ACUTE EPIDIDYMO-ORCHITIS

Epididymo-Orchitis Secondary to Bacteriuria

1. Do urine culture and sensitivity studies
2. Promptly administer broad-spectrum antimicrobial agent (e.g., tobramycin, trimethoprim-sulfamethoxazole, quinolone antibiotic)
3. Prescribe bed rest and perform scrotal evaluation
4. Strongly consider hospitalization
5. Evaluate for underlying urinary tract disease

Epididymo-Orchitis Secondary to Sexually Transmitted Urethritis

1. Do Gram stain of urethral smear
2. Administer ceftriaxone, 250 mg IM once; then tetracycline, 500 mg PO qid for at least 10 days, or doxycycline, 100 mg PO bid for at least 10 days
3. Prescribe bed rest and perform scrotal evaluation
4. Examine and treat sexual partners

Adapted from Berger RE: Urethritis and epididymitis. *Semin Urol* 1983;1:143.

Prostatitis

- Syndrome that presents with inflammation± infection of the prostate gland including:
 - Dysuria, frequency
 - dysfunctional voiding
 - Perineal pain
 - Painful ejaculation

Prostatitis

Table 15–1. CLASSIFICATION SYSTEM FOR THE PROSTATITIS SYNDROMES

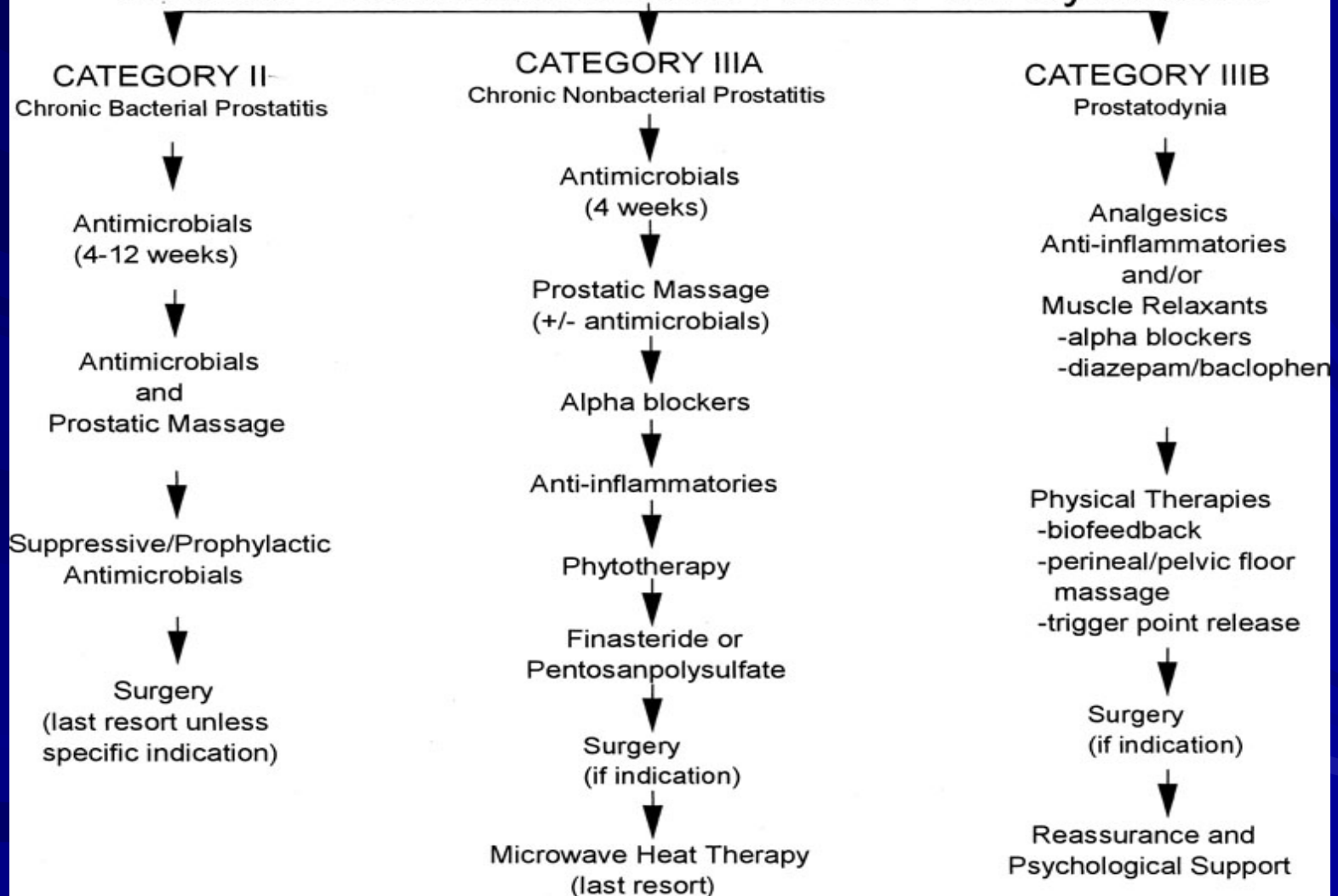
Traditional	National Institutes of Health	Description
Acute bacterial prostatitis	Category I	Acute infection of the prostate gland
Chronic bacterial prostatitis	Category II	Chronic infection of the prostate gland
N/A	Category III chronic pelvic pain syndrome (CPPS)	Chronic genitourinary pain in the absence of uropathogenic bacteria localized to the prostate gland with standard methodology
Nonbacterial prostatitis	Category IIIA (inflammatory CPPS)	Significant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
Prostatodynia	Category IIIB (noninflammatory CPPS)	Insignificant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
N/A	Category IV asymptomatic inflammatory prostatitis (AIP)	White blood cells (and/or bacteria) in expressed prostatic secretions, postprostatic massage urine sediment (VB3), semen, or histologic specimens of prostate gland

N/A, not applicable.

Prostatitis

- Acute Bacterial Prostatitis :
 - Rare
 - Acute pain
 - Storage and voiding urinary symptoms
 - Fever, chills, malaise, N/V
 - Perineal and suprapubic pain
 - Tender swollen hot prostate.
 - Rx : Abx and urinary drainage

Chronic Prostatitis/Chronic Pelvic Pain Syndrome



cystitis

■ S&S:

- **dysuria, frequency, urgency, voiding of small urine volumes,**
- **Suprapubic /lower abdominal pain**
- **± Hematuria**
- **DX:**
 - **dip-stick**
 - **urinalysis**
 - **Urine culture**

Treatment for uncomplicated cystitis

1. Nitrofurantoin—100 mg twice daily for 5 days
 2. Fosfomycin —one-time administration of 3 g.
 3. Oral fluoroquinolones for more than three days.
 4. Trimethoprim/ sulphamethoxazole (Bactrim) 160/800 mg, twice daily 3
 5. β -Lactams, oral cephalosporins may be used, 5 or more days ^e
- For men it is recommended to have treatment for at least 7 days (a Quinolone or Bactrim)

Pyelonephritis

- Inflammation of the kidney and renal pelvis
- S&S :
 - Chills
 - Fever
 - Costovertebral angle tenderness (flank Pain)
 - GI:abdo pain, N/V, and diarrhea
 - Gr-ve sepsis
 - Dysuria, frequency

Pyelonephritis

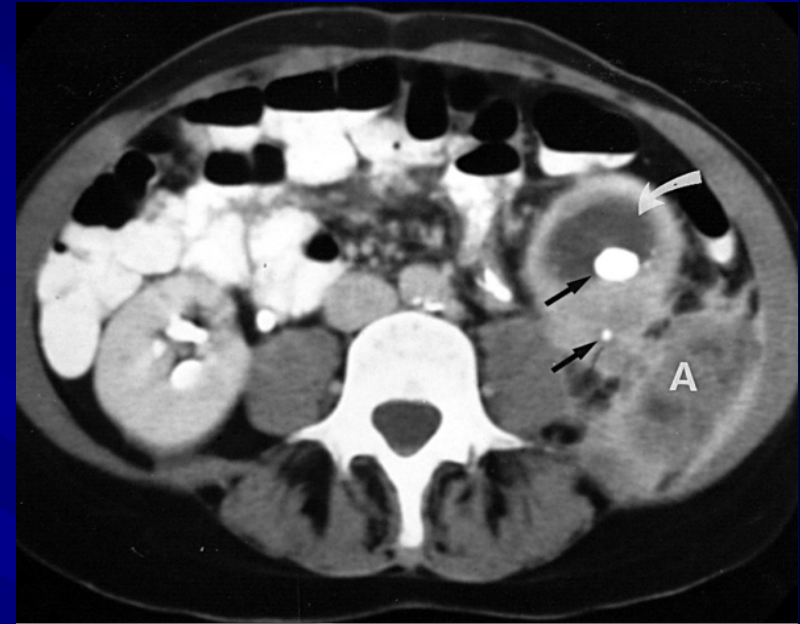
■ Investigation:

- Urine C&S :+VE(80%)
 - *Enterobacteriaceae (E. coli), Enterococcus*
- Urinalysis:↑ WBCs, RBCs,Bacteria
- (±) ↑serum Creatinine
- CBC : Leukocytosis

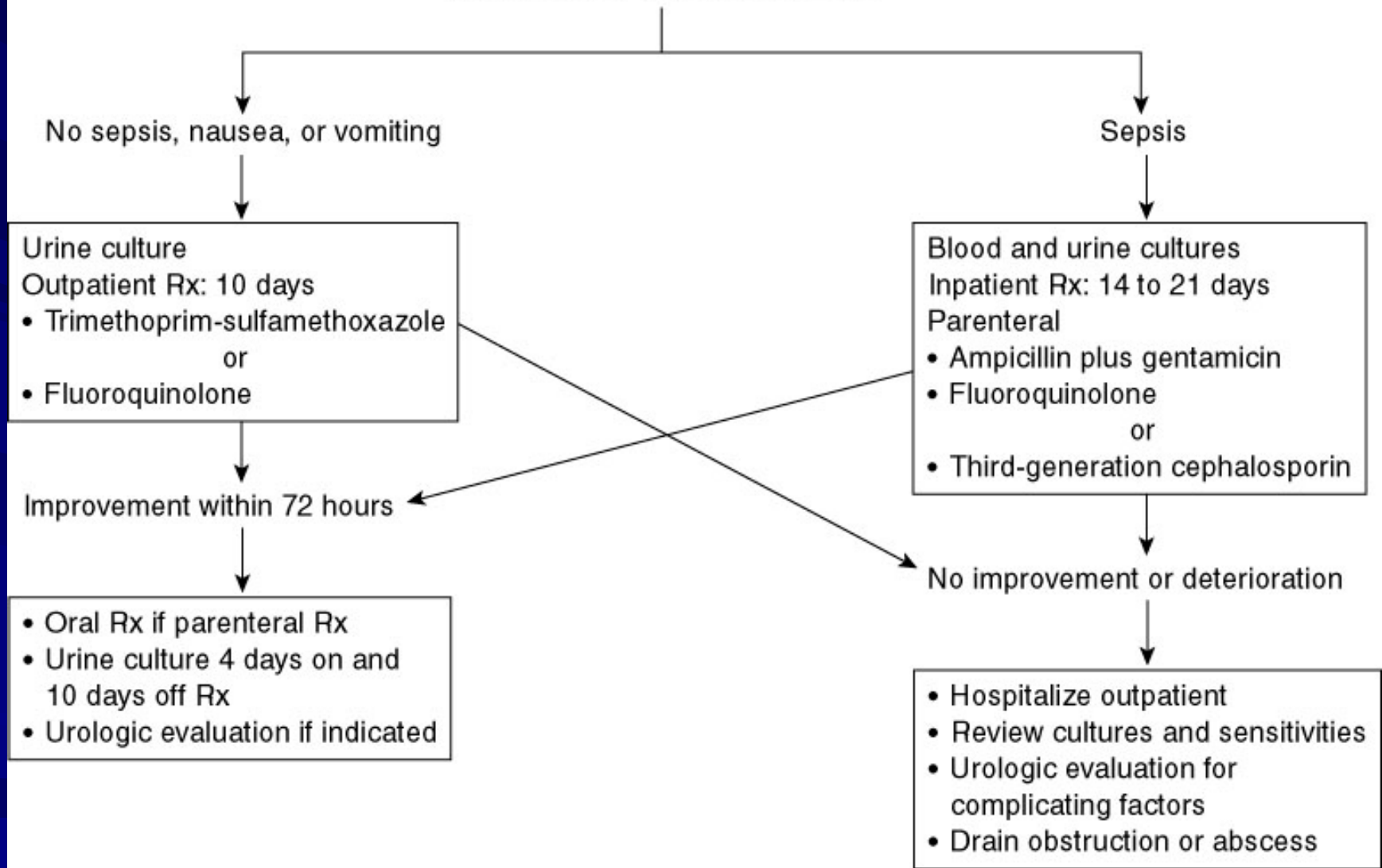
Pyelonephritis

■ Imaging:

- IVP
- U/S
- CT

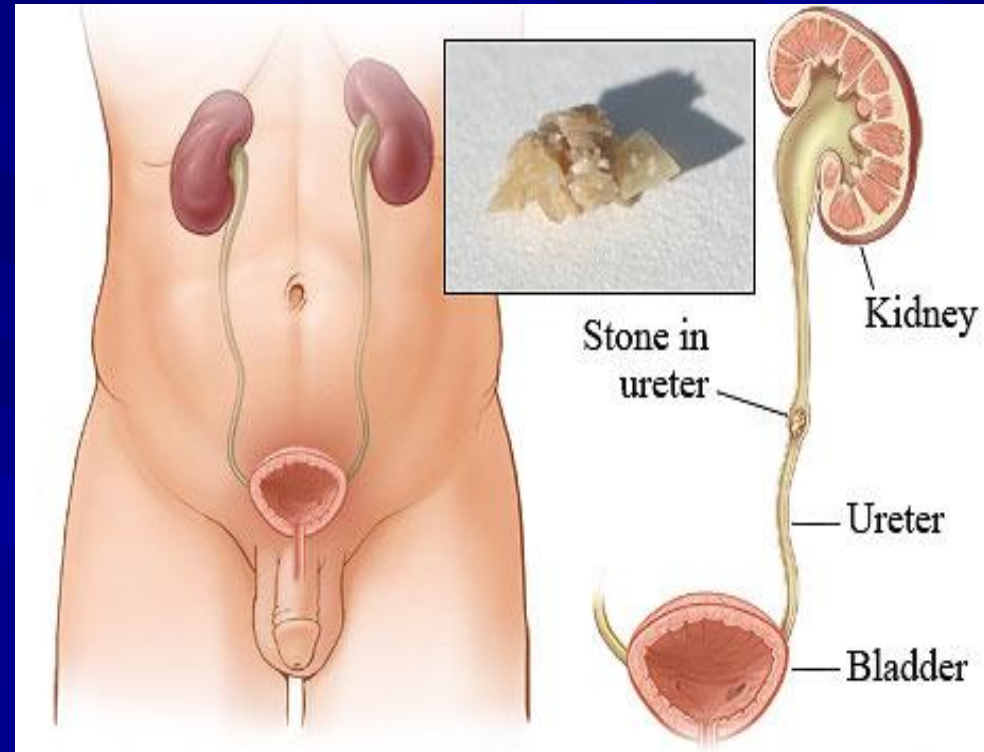


Symptoms and Signs of Pyelonephritis
(Fever, Flank Pain, Leukocytosis)



Urolithiasis

- Egyptian mummies
4800 BC
- Prevalence of 2% to
3%,
- Life time risk: Male :
20%, female 5-10%
- Recurrence rate 50% at
10 years



Urolithiasis

- Risk factors:
 - Intrinsic Factors
 - *Genetics*
 - *Age (20s-40s)*
 - *Sex M>F*

Urolithiasis

■ Extrinsic Factors

- *Geography* (mountainous, desert, tropics)
- *Climate* (July - October)
- *Water Intake*
- *Diet* (purines , oxalates, Na)
- *Occupation* (sedentary occupations)

Urolithiasis

■ How do stones form

- supersaturated → Crystal Growth
- Aggregation of crystals → stone

Urolithiasis

■ **Most people have crystals in their urine, so why not everyone gets stones?**

– Anatomic abnormalities

– Modifiers of crystal formation: Inhibitors/promoters

■ Citrate

■ Mg,

■ urinary proteins(nephrocalcin)

■ oxalate

Urolithiasis

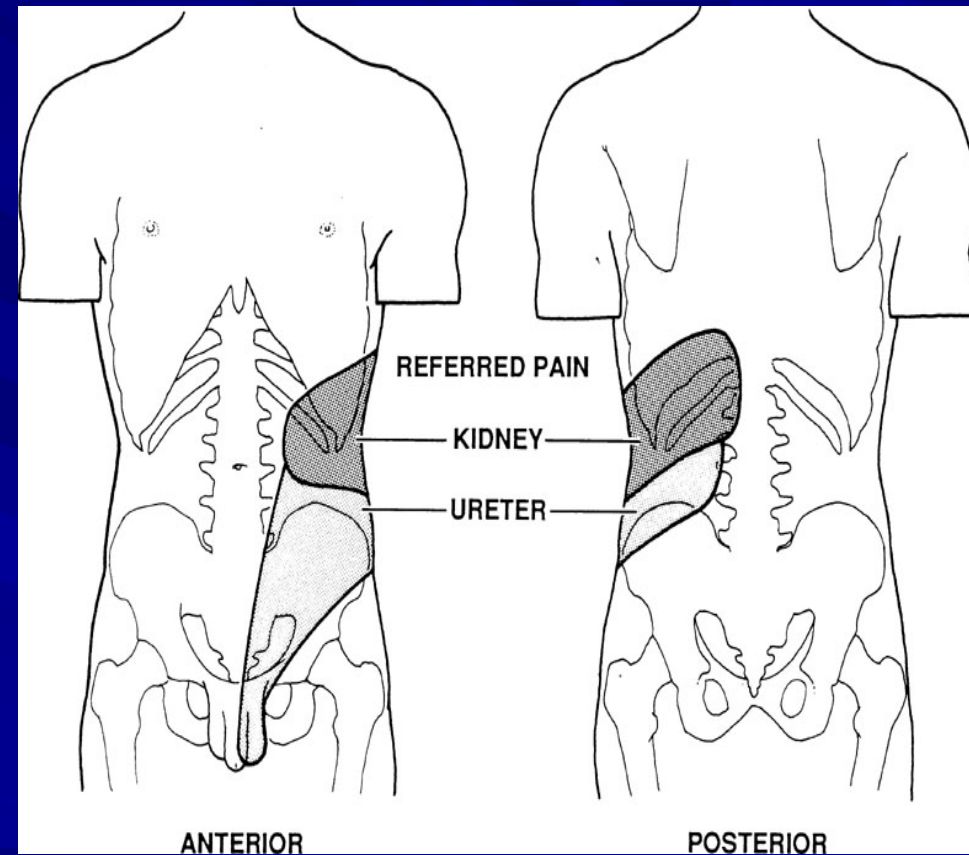
- Common stone types
 - Calcium stones 75%
 - (ca Ox)
 - Uric acid stones
 - Cystine stones
 - Struvite stones



Urolithiasis

■ S&S

- Renal or ureteric colic
- Freq, dysuria
- Hematuria
- GI symptoms: N/V, ileus, or diarrhea
- DDx :
 - Gastroenteritis
 - acute appendicitis
 - colitis
 - salpingitis



Urolithiasis

■ Cont. S&S

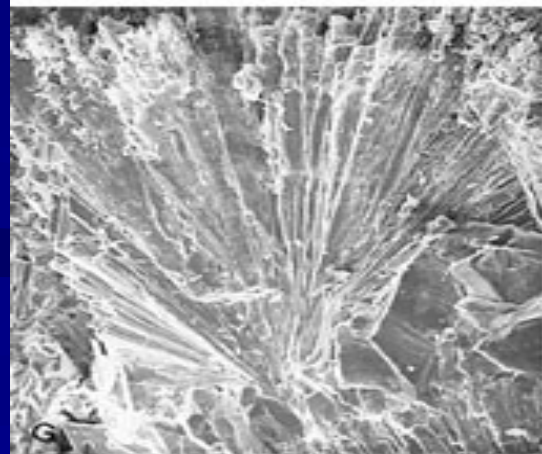
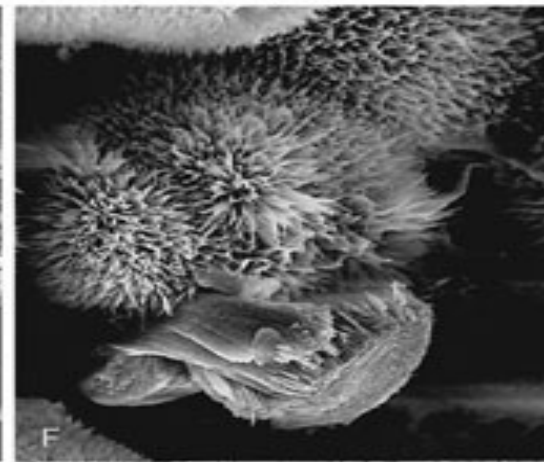
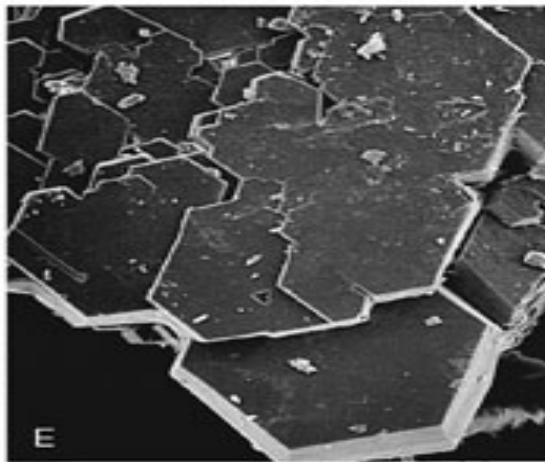
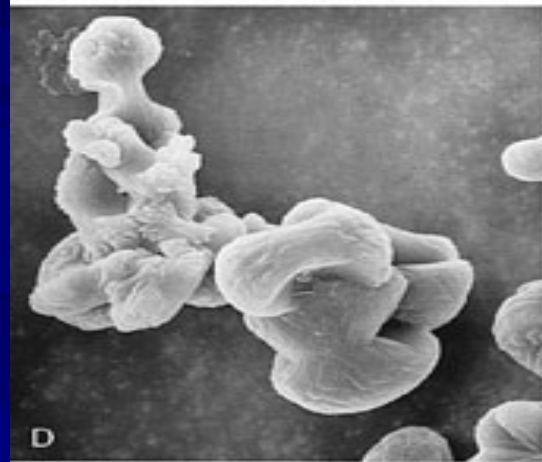
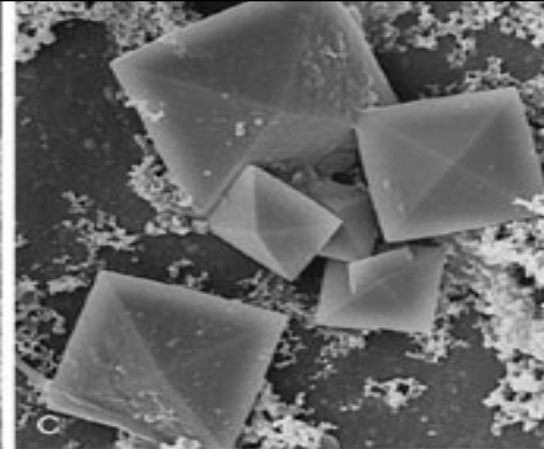
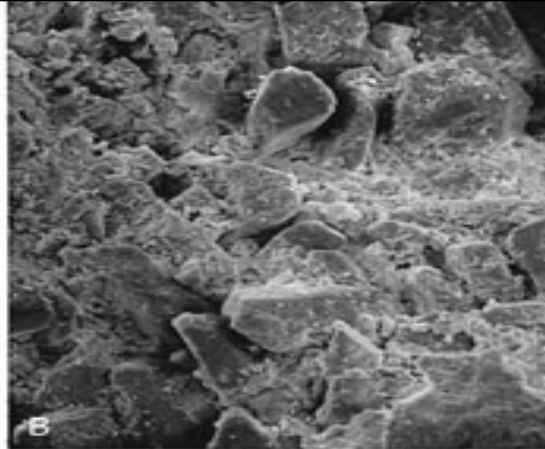
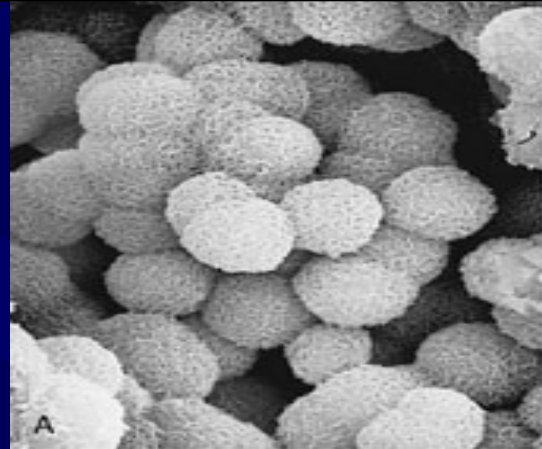
– Restless

- ↑HR, ↑ BP
- fever (If UTI)
- Tender CVA

Urolithiasis Investigation

■ *Urinalysis* :

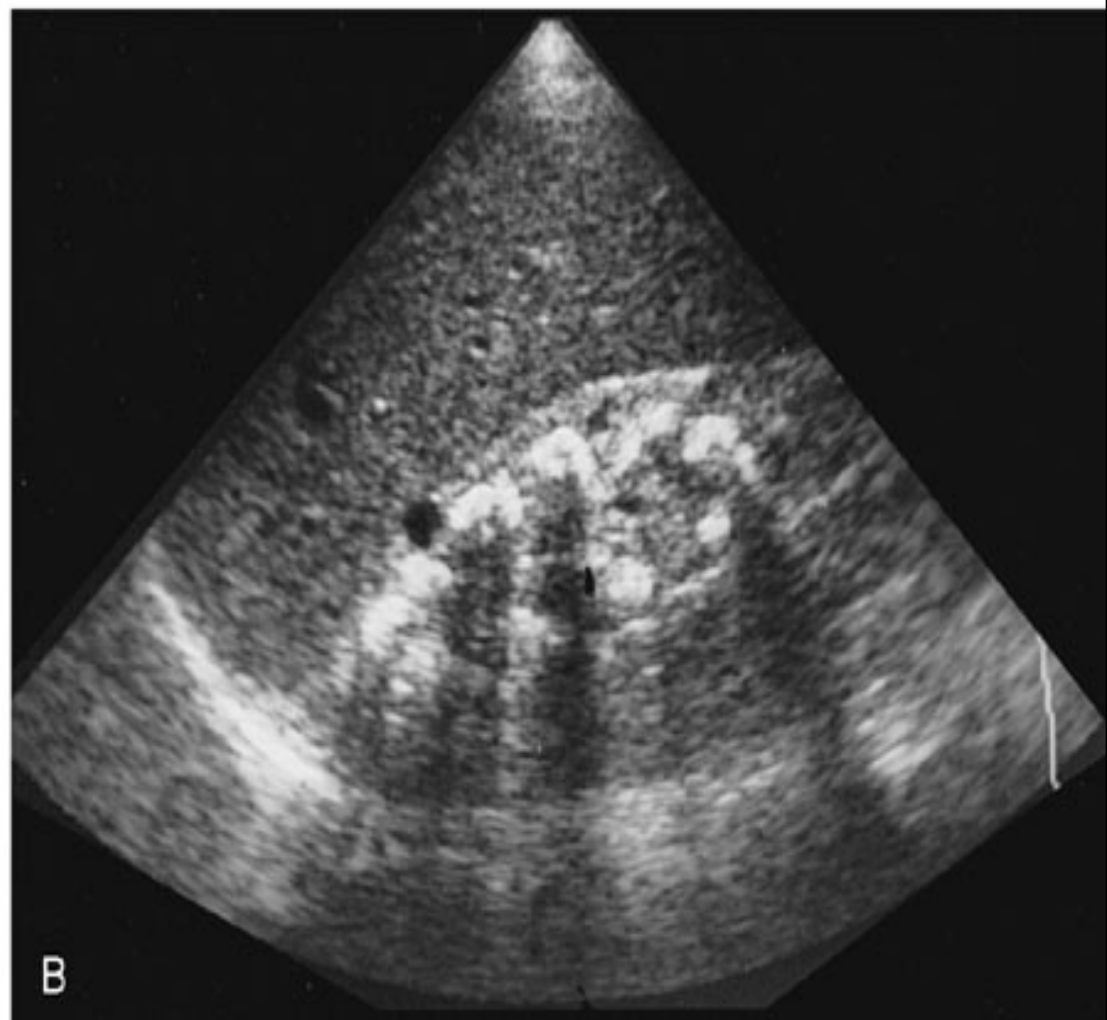
- RBC
- WBC
- Bacteria
- Crystals

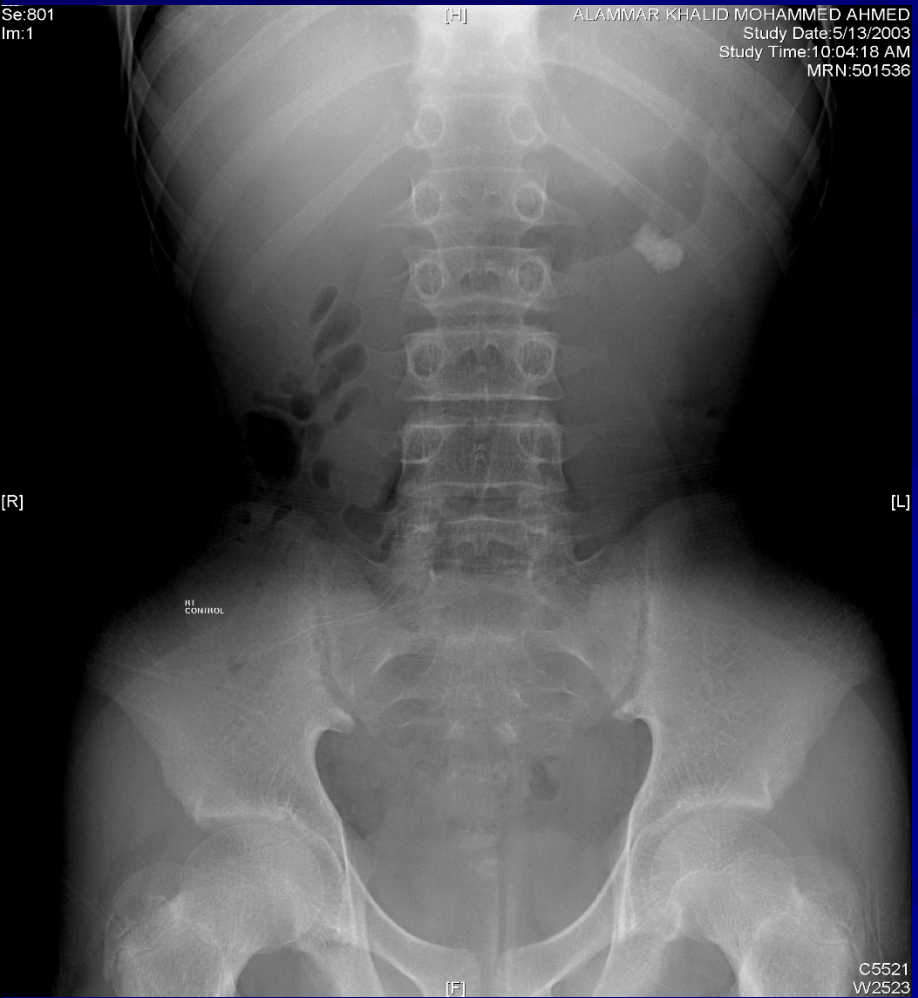


Urolithiasis Investigation

■ Imaging

- Plain Abdominal Films (KUB)
- Intravenous Urography (IVP)
- Ultrasonography (U/S)
- Computed Tomography (CT)





Se:2
Im:108

[A]

[R]

[L]



[P]

C56
W342

Urolithiasis Management

■ Conservative

- Hydration
- Analgesia
- Antiemetic
- Stones (<5mm) >90% spontaneous Passage

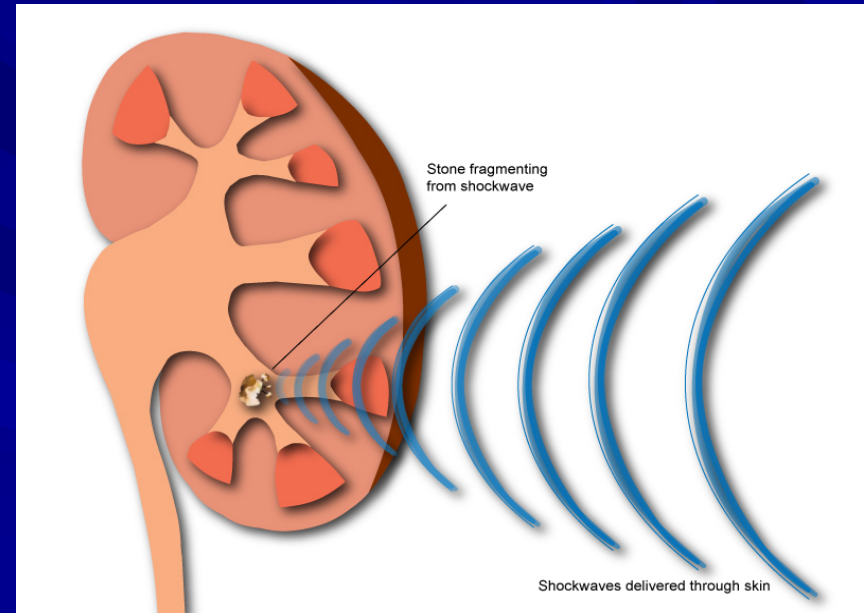
■ Indication for admission

- Renal impairment
- Refractory pain
- Pyelonephritis
- intractable N/V

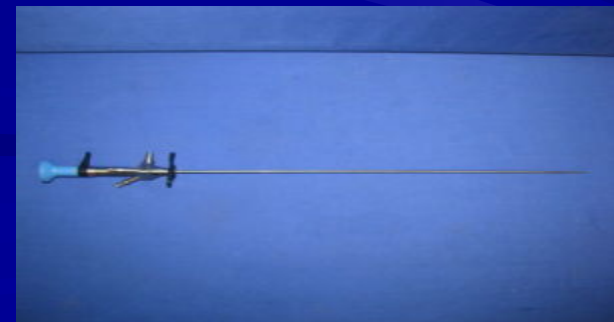
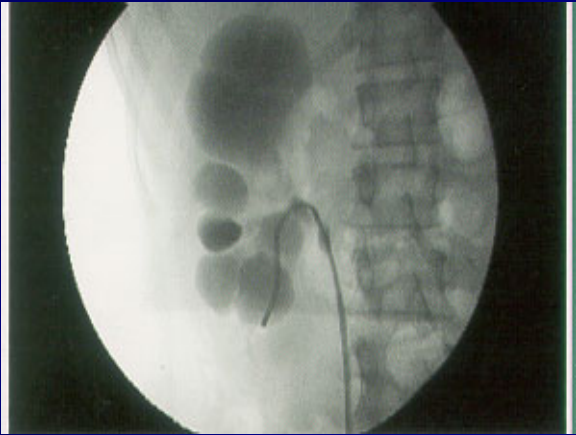
Urolithiasis Management

- Extracorporeal Shock Wave lithotripsy (SWL)
- Ureteroscopy
- Percutaneous Nephrolithotripsy (PNL)
- Laparoscopic/ Robotic
- Open Sx

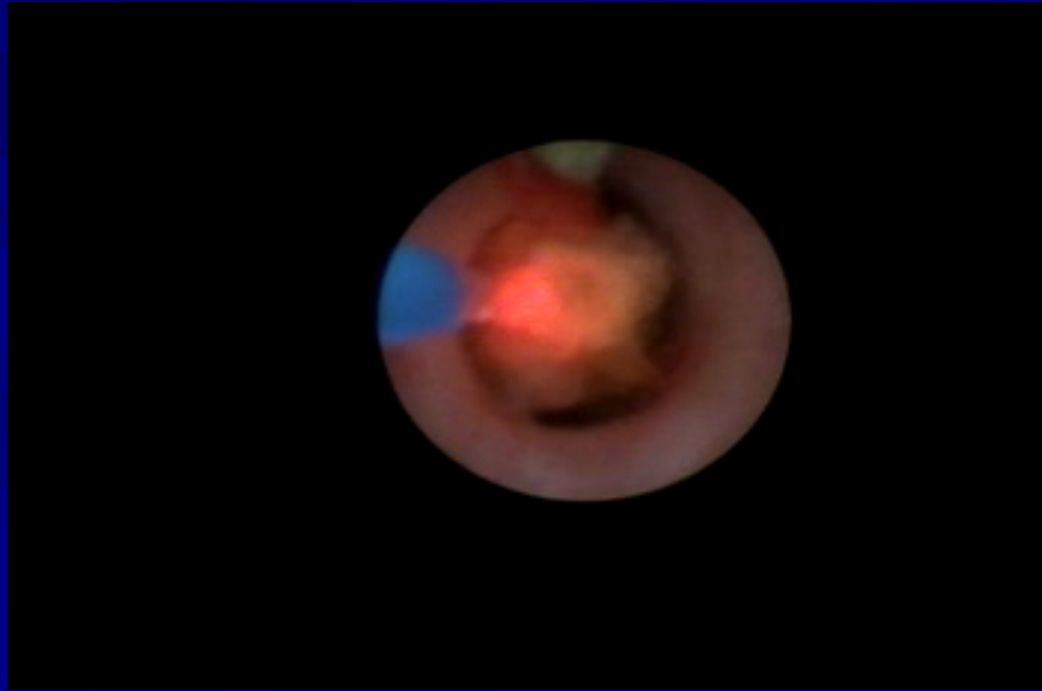
Extracorporeal Shock Wave lithotripsy (SWL)



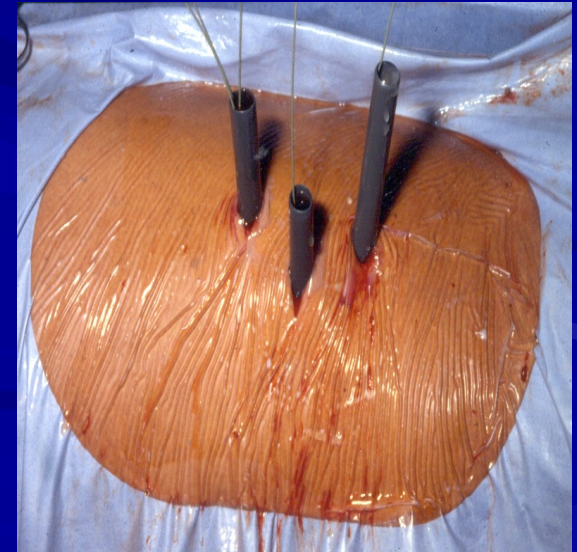
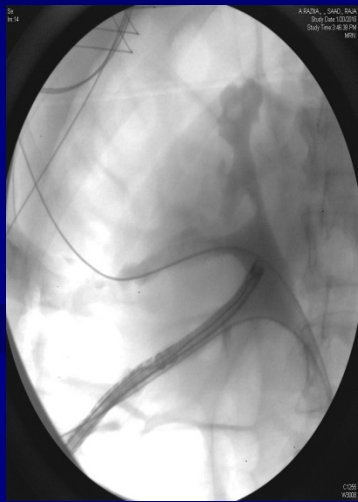
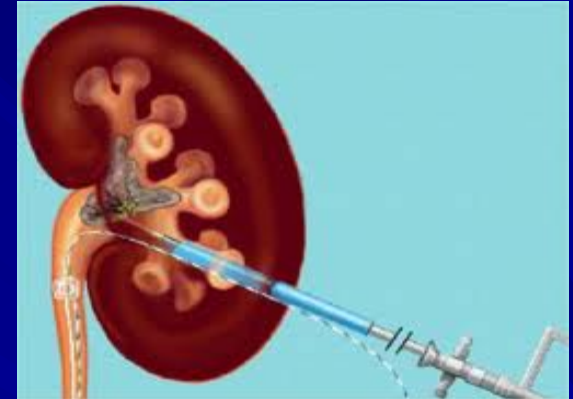
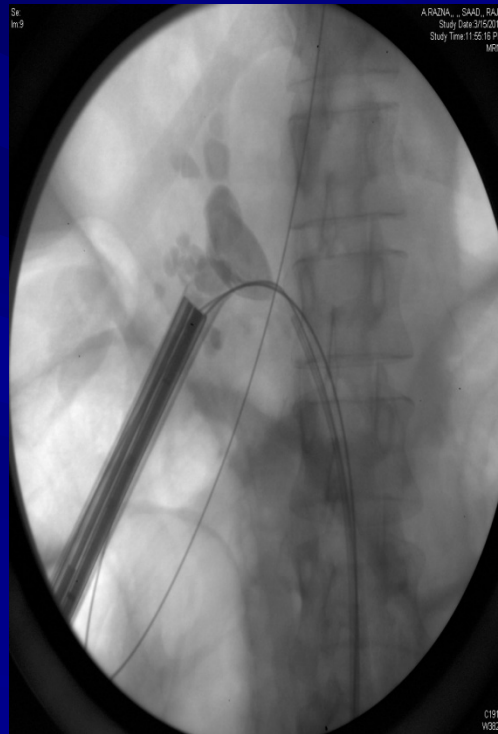
Ureteroscopy



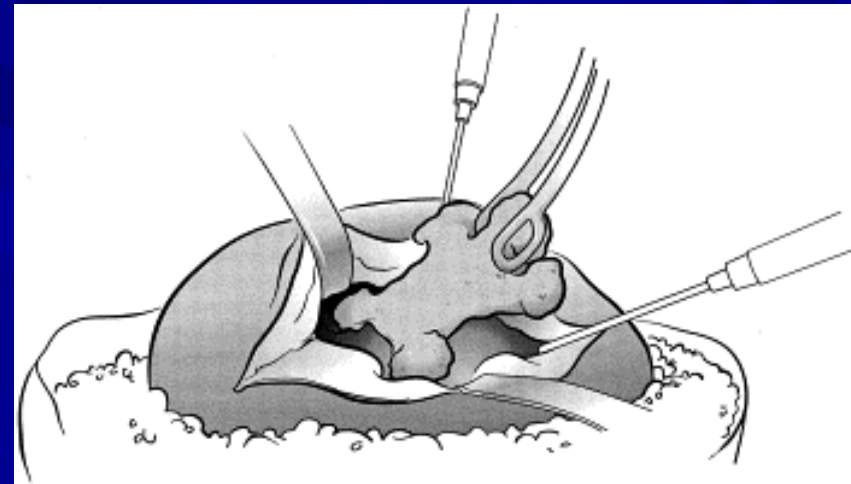
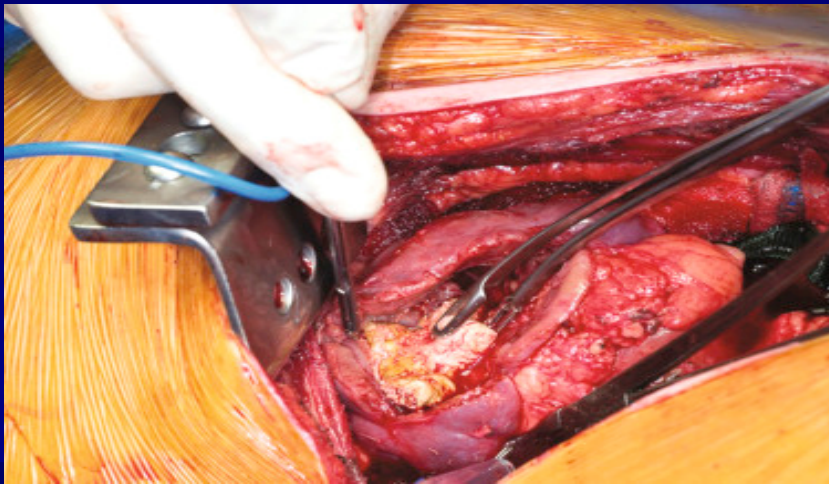
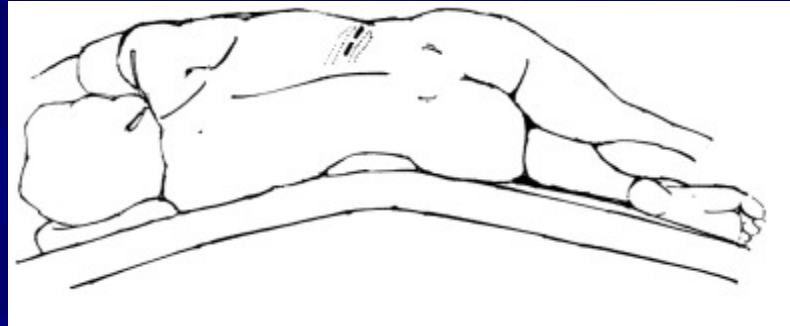
Ureteroscopy: Laser



Percutaneous Nephrolithotripsy (PNL)



Anatrophic Nephrolithotomy



Thank You



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