



I CONFERENCIA DE  
ACTUALIZACIÓN  
EN PEDIATRÍA  
**ALAPE 2011**

# Urinary Tract Infections: A Cloudy Issue At Best

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# Declaración de potenciales conflictos de intereses

Regarding this presentation the following relationships could be perceived as potential conflicts of interest:

 No potential conflicts of interest to declare



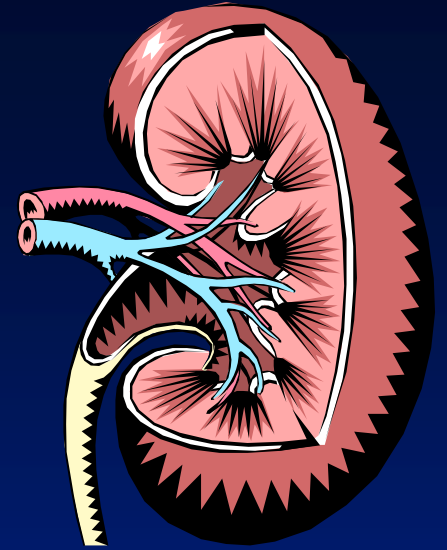
# Objectives

Diagnose urinary tract infections

Select empiric therapy

Select imaging studies

# UTI: Definitions



Positive urine culture

Colony counts: first morning vs. random  
cystitis vs. pyelonephritis

Is 100,000 the correct number?

Sites: bladder, kidney, tubes

# Asymptomatic Bacteruria



Not pathologic

More common in girls

Treatment may be harmful

Often detected during another infection?

Impossible to tell



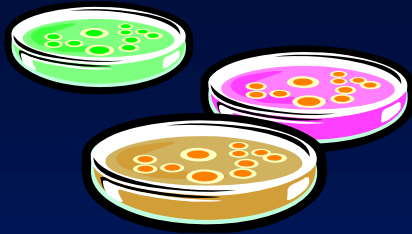
# Urine Collection



Midstream: no need to clean first, often contaminated, need 2 to be sure

Suprapubic: gold standard

Catheterization: 1% risk for infecting, urethral flora present, discard a cc



# Mixed Cultures



Usually means contamination

Catheter related

Fistula to gut

Urinary stasis

# Predisposing Factors

Intact foreskin

Female after age 3 months

Constipation

Dysfunctional elimination

Diarrhea



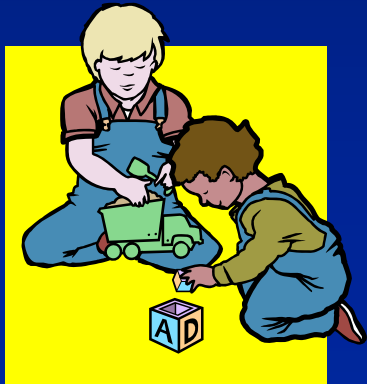
# Vesiculoureteral Reflux



More questions than answers

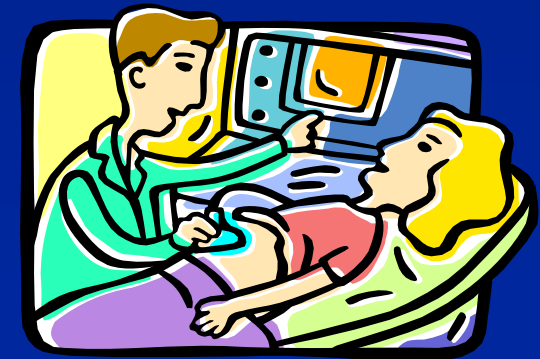
Correction doesn't decrease UTI risk

Very common: look in siblings?



Now detected in utero

Prophylaxis????



# Predisposing Factors

Prior urinary tract infection:

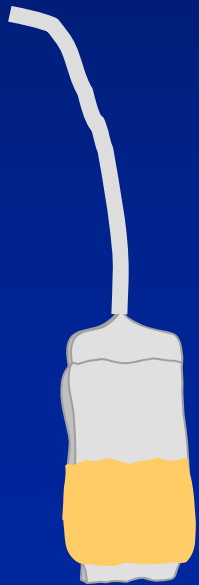
recurrence rates: girls 50%; boys 30%

most common within 3 months

Urinary catheter

Neurogenic bladder

Renal stones



# Clinical Signs & Symptoms

Fever: upper tract

UTI in 8% febrile infants

Dysuria, foul smell

Frequency

Difficult in young child



# Clinical Signs & Symptoms

## Bedwetting

Pain: abdominal, suprapubic, flank, back

Diarrhea: nonspecific sign

Jaundice: neonate



# Complications

Renal damage: acute and chronic

Renal failure, hypertension

Sepsis

Meningitis: infants





# Screening Tests

Urinalysis:

Pyuria: leukocyte esterase, microscopic, common, viral vs. bacterial

Nitrites: less sensitive in children, fresh void required

Gram stain of unspun

# Pyuria and Bacteruria

Process specimen promptly

Urinalysis not a stat test

Bacteria double every 20 minutes

Enhanced urinalysis: hemocytometer

not generally available





# Screening Tests



All require prompt testing

Rarely possible

In US, CLIA regulations limit office tests

# Culture Confirms Dx



Pretreatment a big problem

*Escherichia coli* expected pathogen

Any other organism: expect anomaly

Others: gram negatives, fungi

*Staphylococcus saprophyticus*



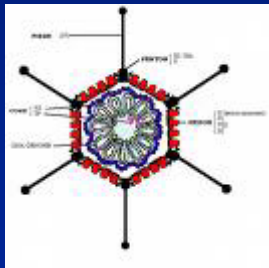
# More Pathogens

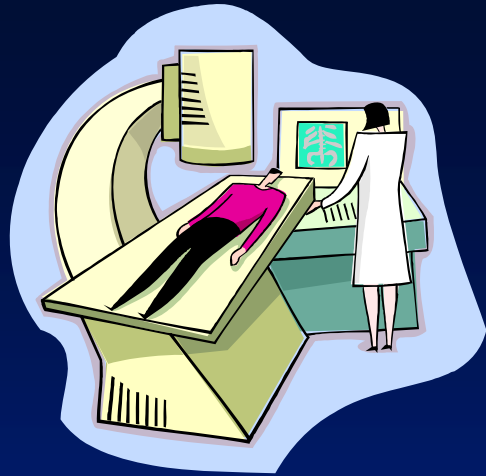
*Mycobacterium tuberculosis:*

sterile pyuria

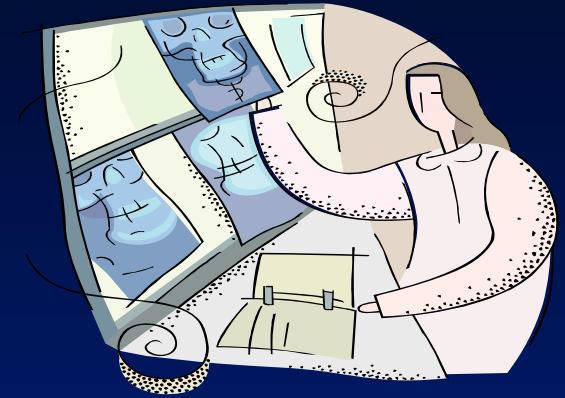
Adenovirus:

pyuria and hematuria





# Imaging



Confirm diagnosis in pretreated

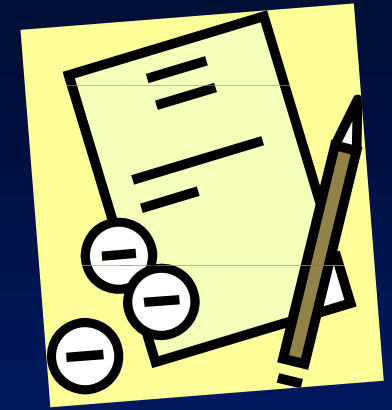
Look for complications

Document upper tract disease

Indications changing all the time



# Treatment



Antibiotics: oral usually best

Drug of choice: resistance a factor  
cephalosporin, gentamicin, narrow

Duration: 2 hand rule, short course not  
recommended in children



# Treatment

Exclude and correct obstruction

Evaluate for elimination dysfunction

Evaluate for and treat constipation

Remove catheter if present



# Evaluation

Purpose is to exclude predisposing factor

Renal ultrasound: value ?

no radiation, generally available,  
not traumatic, prenatal detect most,  
dilatation part of acute infection

# Voiding Cystourethrogram

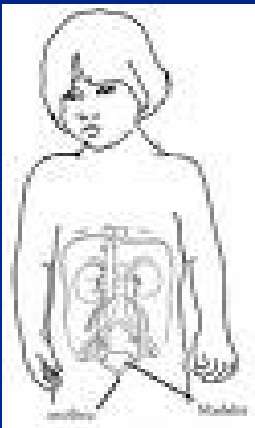
Detect vesiculoureteral reflux



Detect outlet obstruction – valves

Detect bladder abnormalities: neurogenic,  
diverticula, failure to empty

Timing not critical





# Evaluation

Renal scan: determine function,  
identify scars

Computed tomography

Blood studies: BUN, creatinine

Blood culture



# Bacteremia

Common during infancy

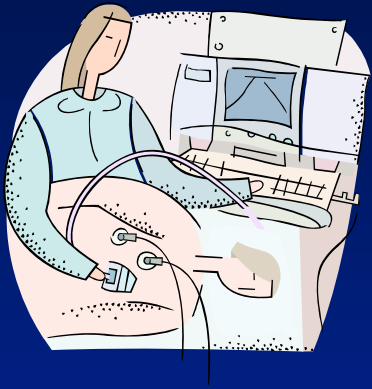
Central nervous system seeding

Significance not so clear:

clinically you can't tell,

outcomes are the same

# Ultrasound Results



Normal – fine

Abnormal:

Dilated pelvis – expected

Duplication, etc – refer

Phlegmon – treat longer?



# VCUG Results

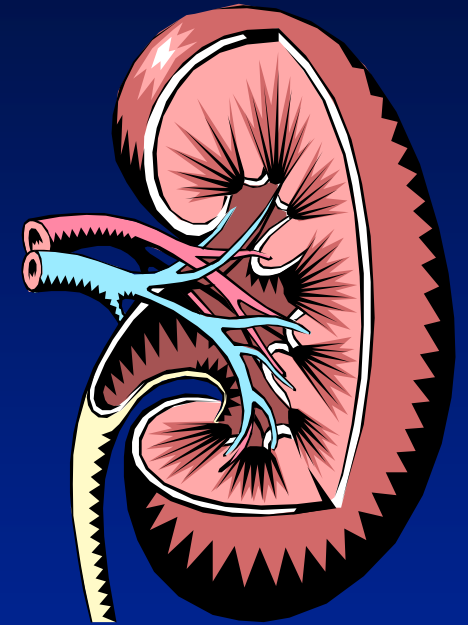
Normal – great

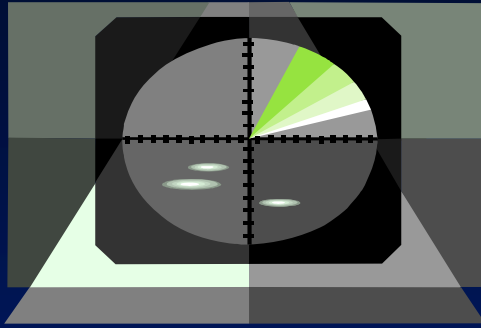
Reflux – prophylaxis?

Low grade – follow

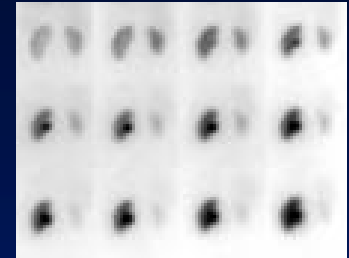
High grade – refer

Screen siblings – who knows





# Other



## Renal scan

Normal – pyelonephritis unlikely

Abnormal – transient or scars

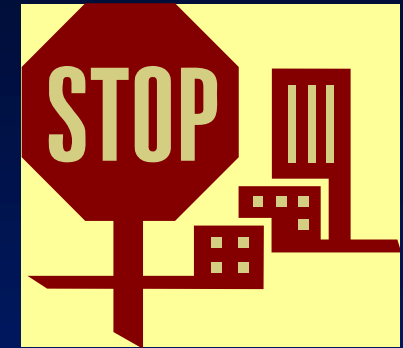
BUN, creatinine

Normal – fine

Abnormal – acute, consider referral



# Prevention



Prophylactic antibiotics: value?

Work while taken

Break through cases resistant

Tough to show long term benefit



# Prevention

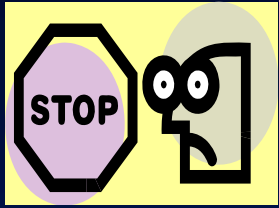


Wiping direction:

Show me the evidence!

Avoid catheters:

indwelling catheters are the greatest risk



# Prevent Renal Damage



Detect and treat infections early:

get cultures on febrile infants

Positive once, look whenever febrile

Identify and treat constipation, voiding dysfunction, urinary anomalies

Avoid catheters



