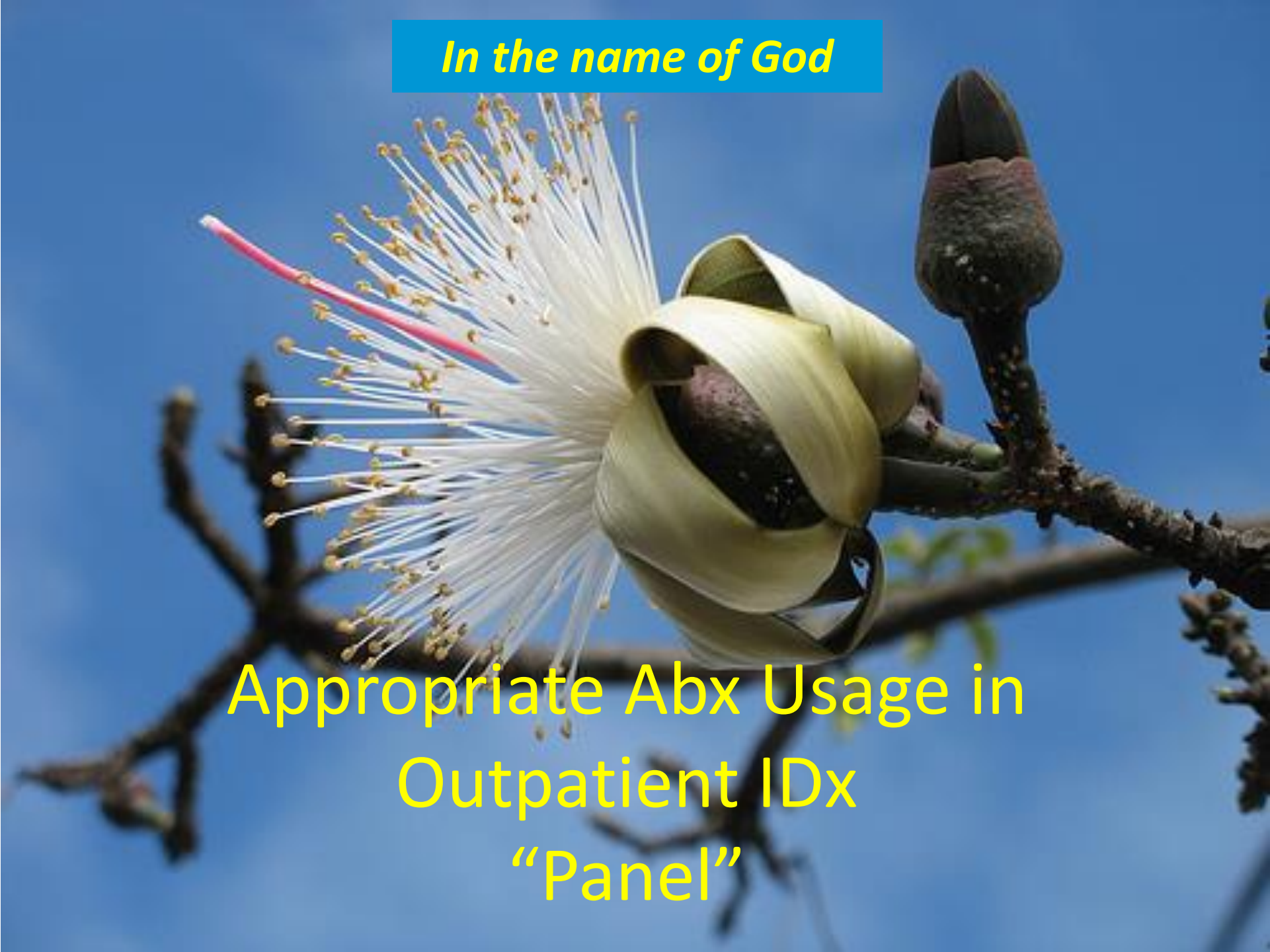


In the name of God

Appropriate Abx Usage in Outpatient IDx “Panel”



Base of Antibiotic selection in OPD.

Q₁: Is Abx indicated on clinical base?

- A. Obvious and focal bacterial infection(eg.:Cellulitis)
- B. Probable bacterial infection (Hx & P.E & Lab. F.)

Q₂: Appropriate clinical specimen?

G.stain, culture, etc.

Q₃: Most likely organism?

- A. Epidemiology
- B. Prior Abx usage
- C. Sensitivity pattern

Q₄-Where is the **site** of infection?

- A. Local infection: concentration at least at MIC level
- B. F. body in site
- C. PH of infected site: Tetra.,chlor. & Nitrof. : (effective in low PH)
and erythro, clinda. & AG effective in high PH.

Q₅ : Which agent is the best?

- A. Bactericidal or Bacteriostatic
- B. The Lowest adverse effect.
- C. Low cost.
- D. Narrow Spectrum

Q₆: Is there any specific **host** factor?

Age , Immune deficiency and *Organ Dysfunction*.

A: 4 patients presented with pharyngitis as you can see.



4y/o



7y/o



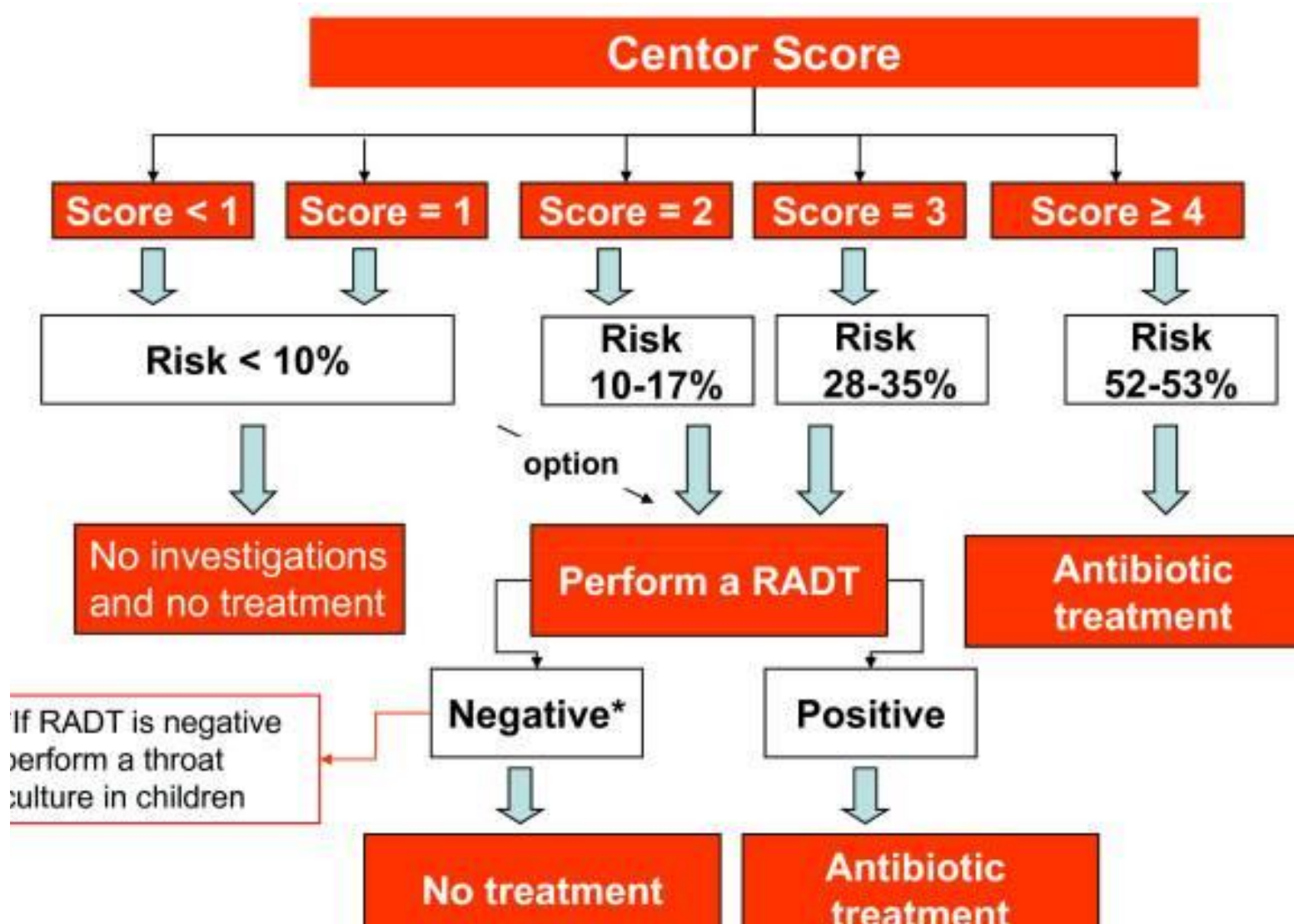
10y/o



14y/o

A. Please describe each one and then tell us which points in Hx and P.Ex do you need for deciding how to manage them(supportive or with Abx)?

American College of Physicians (ACP)



However, it cause an over-treatment since only 50% of patients with a Centor score of 4 suffer from a streptococcal pharyngitis

American Hearth
Association
and AAP

Drug	Dose	Duration
Penicillins		
Penicillin V (oral)	- Children <27 kg: 400 000 U (250 mg) 2 to 3 times daily ; - Children >27 kg, adolescents, and adults: 800 000 (500 mg) 2 to 3 times daily	10 days
Amoxicillin (oral)	50 mg/kg once daily (maximum 1 g)	10 days
Benzathin Penicillin G (intramuscular)	- Children <27 kg: 600 000 U (375 mg); - Children >27 kg, adolescents, and adults: 1 200 000 U (750 mg)	Once

Symptoms and Clinical Findings	Sensitivity (%)	Specificity (%)
Absence of cough	51-79	36-68
Anterior cervical nodes swollen or enlarged	55-82	34-73
Headache	48	50-80
Myalgia	49	60
Palatine petechiae	7	95
Pharyngeal exudates	26	88
Fever >38°C	22-58	52-92
Tonsillar exudate	36	85

Diagnosis

Clinical criteria	Points
Absence of cough	1
Swollen and tender anterior cervical nodes	1
Temperature > 38°C	1
Tonsillar exudate or swelling	1
Age 3 to 14 years	1

For individuals allergic to penicillin

- Cephalexin ,20 mg/kg/dose BD(max = 500 mg/dose) ,10 D
- Cefadroxil, 30 mg/kg once daily (max = 1 g) , 10 D
- Clindamycin, 7 mg/kg/dose TDS ,max = 300 mg/dose) ,10 D
- Azithromycin, 12 mg/kg once (max = 500 mg), then 6 mg/kg (max=250 mg) once daily for the **next 4 days**
- Clarithromycin, 7.5 mg/kg/dose BD (max = 250 mg/dose) for 10 D

E.: As you can see 5 patients presented with cutaneous infection.

A . Please describe the lesions.

B. On the base of appropriate Abx usage , do you manage in OPD or hospitalize them ? Why?

C. Which Abx is the most appropriate for each case?



Case:1



Case:2



Case:3



Case:4



Case:5

Impetigo



- Small blisters and red lesions that develop into golden-colored crusted sores.
- The most common form : Non-bullous
- Commonly seen around the mouth and nose.
- *Staphylococcus aureus*, Group A *Streptococcus*

(bullous Impetigo):



Insect bite



- Erythematous papule with surrounding erythema
- Tiny puncture mark
- Clear or haemorrhagic center
- On a body site exposed to the insect
- Usually on exposed area of the body
- Those with intensely pruritic lesions may develop skin excoriation from scratching, and evidence of secondary bacterial infection may be present.

Erysipelas



- Superficial erythematous skin inflammation with well-defined borders
- Elevated and painful redness.
- Often occurs on the face or limbs, usually accompanied by fever.
- Group A *Streptococcus*
- Mabee reddish streaks of lymphangitis project out from the margins of the lesion.
- The onset is abrupt, and signs and symptoms of a systemic infection, such as high fever, are often present

Cellulitis



- Inflamed skin lesion with redness, swelling and indistinct borders
- Pain, and local warmth.
- Fever and systemic symptoms may present
- *S. Aureus* and GAS; also by group B streptococcus (neonates) and *S. Pneumoniae*, *H. Influenzae* type b
- Streptococcal and staphylococcal cellulitis: any age and any site
- History of antecedent trauma
- Sometimes: hematogenous

Sharp Object-Induced Infections



- An infectious lesion on the sole of a child's foot, following the penetration of a sharp object.
- Central white or yellow area(pus) surrounded by redness (inflammation).
- Often caused by staphylococcus aureus.

Indications for Admission

Erysipelas

- **Systemic symptoms:** Fever, chills, or signs of systemic toxicity (e.g., lethargy, hypotension, or confusion).
- **Rapid progression:** Rapidly spreading erythema or severe local symptoms (e.g., intense pain, bullous lesions, or necrosis).
- **Facial involvement:** Particularly if involving the periorbital region, due to risk of complications like orbital cellulitis.
- **Comorbidities:** Presence of diabetes, immunosuppression, or chronic edema, which increase complication risk.
- **Failure of outpatient treatment:** Persistent or worsening symptoms despite oral antibiotics.
- **Neonates or infants:** Higher risk of severe infection, especially if the umbilical or diaper region is involved.

Cellulitis

- **Moderate to severe infection:** Symptoms such as high fever, chills, or systemic signs. (SIRS: $>2/4$ tachycardia, hypotension...)
- **Periorbital or orbital involvement:** Risk of vision-threatening complications like cavernous sinus thrombosis.
- **Rapid spread or large area affected:** Extensive erythema, swelling, or warmth that worsens quickly.
- **Signs of complications:** Abscess formation, necrosis, or suspicion of necrotizing fasciitis (e.g., disproportionate pain, crepitation).
- **Failure of oral antibiotics:** No improvement or worsening after 48 hours of outpatient treatment.
- **Neonates or immunocompromised children:** Higher risk of systemic spread or sepsis.
- **Compartment syndrome risk:** Circumferential cellulitis potentially requiring surgical evaluation.

Indications for Admission

Impetigo

- **Systemic symptoms:** Fever, lymphadenitis, or signs of deeper infection (e.g., cellulitis).
- **Ecthyma:** A deeper form of impetigo with painful ulcers, increasing risk of scarring or systemic spread.
- **Complications:** Suspected poststreptococcal glomerulonephritis (e.g., hematuria, proteinuria) or staphylococcal scalded skin syndrome.
- **Failure of outpatient treatment:** Persistence or spread of lesions despite topical or oral antibiotics.
- **Neonates or infants:** Bullous impetigo is more common in children under 2, with higher risk of complications.

Insect Bite

- **Signs of secondary infection:** Redness, swelling, warmth, or pus indicating cellulitis or impetigo.
- **Systemic symptoms:** Fever, chills, or lymphadenopathy suggesting lymphangitis or systemic spread.
- **Rapidly progressing infection:** Red streaks (lymphangitis) or extensive erythema.
- **Suspected systemic infection:** Such as Lyme disease (from tick bites) or sepsis, especially with fever or lethargy.
- **Allergic reactions:** Anaphylaxis or severe local reactions (e.g., Skeeter syndrome) requiring emergency management.
- **Immunocompromised children:** Increased risk of severe infection or complications.

Indications for Admission

Sharp Object-Induced Infections

- **Deep or penetrating wounds:** Risk of involvement of fascia, muscle, or bone (e.g., osteomyelitis, septic arthritis).
- **Systemic symptoms:** Fever, chills, or signs of sepsis (e.g., hypotension, lethargy).
- **Signs of severe infection:** Abscess, necrosis, or rapidly progressing erythema suggesting necrotizing fasciitis.
- **Foreign body presence:** Retained objects increasing infection risk, often requiring surgical exploration.
- **Immunocompromised or neonates:** Higher risk of systemic spread or complications.
- **Failure of outpatient management:** Worsening infection despite oral antibiotics or wound care.

Treatment

Impetigo

❑ **Topical** :For mild, localized cases of nonbullous cases :Mupirocine 2% -
Apply 2–3 times/day for 7–10 days

❑ **Systemic**

- Indications: Bullous, Widespread or large lesions, Topical therapy is not practical (perioral), Deep lesions, Suspected/confirmed MRSA
- Empiric:
 - Clindamycin, Doxycycline,
 - Combination of TMP-SMX and Amoxicillin
- MSSA confirmed or suspected:
 - Cephalexin
 - Amoxicillin/clavulanate

Insect Bite

❑ Antibiotic indicated if symptoms of infections exist:

- Pus in or around the bite.
- Swollen glands
- Increased pain, swelling and redness in and around the bite
- Empiric:
 - Clindamycin, Doxycycline,
 - Combination of TMP-SMX and Amoxicillin
- MSSA confirmed or suspected:
 - Cephalexin
 - Amoxicillin/clavulanate

Sharp Object-Induced Infections

- Empiric:
 - Clindamycin, Doxycycline,
 - Combination of TMP-SMX and Amoxicillin
- MSSA confirmed or suspected:
 - Cephalexin
 - Amoxicillin/clavulanate

Treatment

Erysipelas

- Topical treatment is not recommended.
- Systemic oral therapy: penicillin, amoxicillin, cephalexin, or clindamycin
- Systemic Parenteral therapy : penicillin or cefazolin; clindamycin

Cellulitis

- Empiric:
 - Clindamycin, Doxycycline,
 - Combination of TMP-SMX and Amoxicillin
- MSSA confirmed or suspected:
 - Cephalexin
 - Amoxicillin/clavulanate
- For infants with buccal or periorbital involvement or in infants with soft tissue involvement but without a clear-cut focus of infection: Clindamycin with third-generation cephalosporin

F:A 27 m/o girl presented with fever and watery diarrhea. She is slightly dehydrated.

U/A:S.G:1.030 with 8-10 WBC/HPF. Stool Ex: 15 WBC and ,+ve Leukocyte esterase.

A. Do you request for S/C?

B. Do you prescribe Antibiotic ? Why? If yes which Abx?

C. If diarrhea and fever continues, what is your next plan?

Most common causes

- The causes of infectious diarrhea vary between regions, from rural to urban settings, and depend on co-morbidities like immunodeficient state.
- **Viruses** is the most common cause of acute gastrointestinal (GI) illness.
- **Bacteria** are more likely pathogens in cases of severe or bloody diarrhea compared with milder watery diarrhea.
- **Noninfectious causes** of acute diarrhea include drug adverse effects, food allergies, primary GI diseases such as inflammatory bowel disease (IBD), and other disease states such as thyrotoxicosis.

Overview of Diarrhea causes:

● **Small bowel:** leads to a watery diarrhea that occurs in large volume and is associated with abdominal cramping, bloating, gas, and weight loss.

fever is rarely a significant symptom, and the stool does not contain occult blood or inflammatory cells.

Enteric viruses (and specifically norovirus) are the most common causes of watery diarrhea

● **Large bowel:** present with frequent, regular, small-volume, often painful bowel movements.

Fever and bloody or mucoid stools are common, and red blood cells and inflammatory cells can be seen routinely on the stool smear.

Bacterial pathogens are more common causes of inflammatory, large intestinal diarrhea

Bacterial & protozoal of small bowel AGE:

- **Vibrio Cholera:**

- Doxycycline 5mg/kg (single dose)
- Azithromycin 20 mg/kg (single dose)
- Ciprofloxacin 10-15 mg/kg per dose, twice daily for 3 days

- **Giardia Lamblia:**

- ✓ Metronidazole & Tinidazole
- ✓ Albendazole
- ✓ Combination therapy

Bacterial & protozoal of large bowel AGE:

- **Shigella:** cefixime -azithromycin-ceftriaxone-ciprofloxacin-Nalidixic acid
- **Salmonella(Non Typhi):**in high-risk groups: like as shigella
- **E. Coli:** no antibiotic
- **Campylobacter:** azithromycin - ciprofloxacin
- **Entamoeba Histolytica:**
 - ❖ Asymptomatic carrier
 - ❖ Symptomatic: metronidazole or tinidazole
 - ❖ Lumen eradication: paromomycin(7 Days) – diloxanide(10 Days) – iodoquinol (20 Days)

Types of diarrhea

Small Bowel Diarrhea

- Viral
- persistent diarrhea (Vibrio Cholera or Giardia)

Large Bowel Diarrhea

- Bacterial (begin Ab.)
- Persistent diarrhea (S/E & S/C)
Resistance Shigella or Amebiasis or
Non infectious causes

G:3 patients suspected to sinusitis are presented to you . According to given information please answer to the following questions:

A. Describe the PNS imaging.

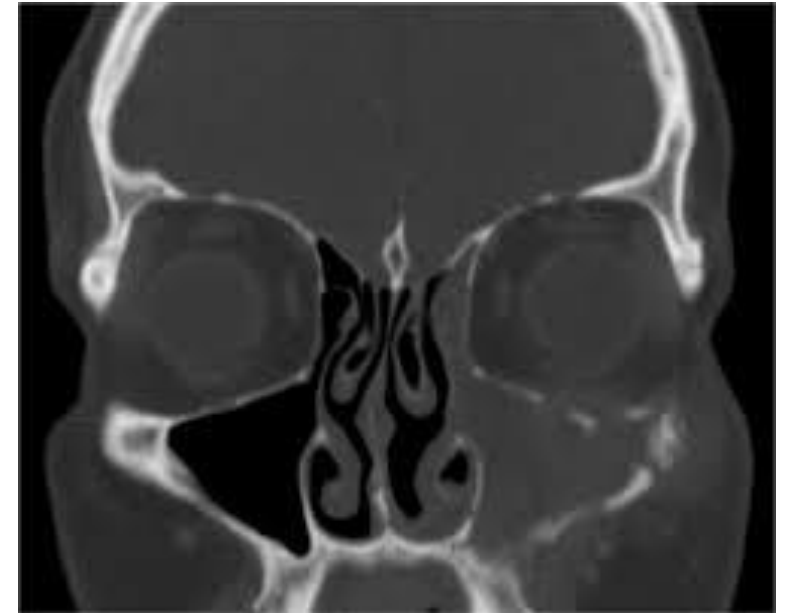
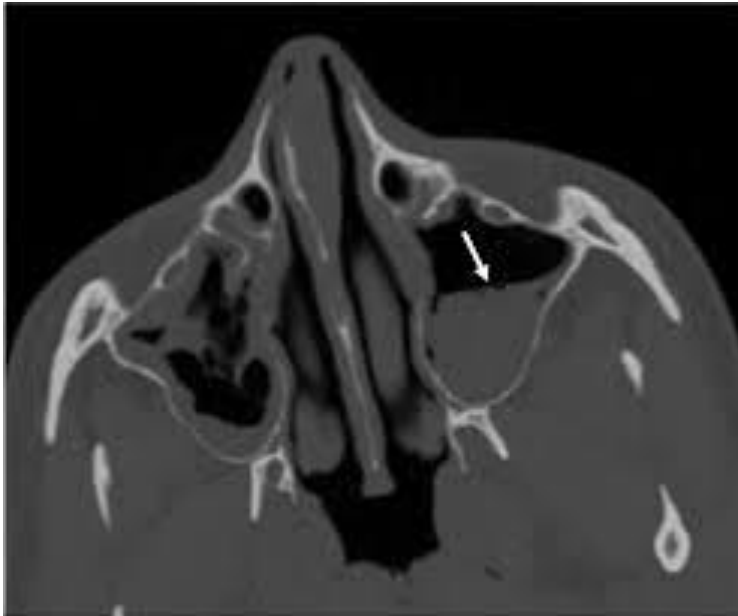
B. Are these cases need Abx? If not why?

C. If yes which Abx are the best (Lines of Abx treatment in acute bacterial sinusitis)?

G1: A 5 y/o boy with URI (cough ,rhinorrhea and PND) for up to 7 days.

G2: A 9 y/o girl with persistent Rhinorrhea, snoring , and early morning cough.

G3: A 10 y/o toxic child with h.g. fever and halitosis following 3 days duration of URI.



XRY Findings in ABS

Plain X-ray is no longer recommended for routine evaluation of sinusitis in children.

- Low sensitivity and specificity.
- Cannot distinguish viral from bacterial etiology.
- Overlap with normal variants and allergic rhinitis.
- May miss ethmoid or sphenoid sinus involvement, especially in younger children.

1. Mucosal Thickening

1. The most common finding.
2. Appears as a soft-tissue density along the walls of the sinus cavity.

2. Air-fluid Level

1. A horizontal line indicating fluid with air above it — a more specific finding.
2. Strongly suggests acute bacterial sinusitis when present in the maxillary sinuses.

3. Sinus Opacification (Complete or Partial)

1. A sinus that appears completely white (opaque) may indicate fluid or very thickened mucosa.
2. Can also be seen in viral infections or allergic inflammation, so not specific.

4. Thickened Bony Walls or Sclerotic Changes

May suggest chronic sinusitis rather than acute disease



Understanding the Common Cold



Fever



Nasal Symptoms & Watery eyes

Runny or stuffy nose. Mucus may change color.



Cough and Sneeze

Frequent coughing and sneezing are typical signs.



Mood Changes

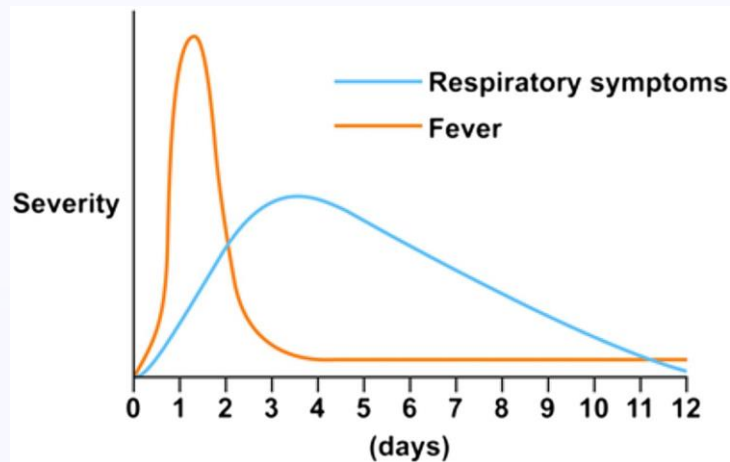
Children might be irritable. Appetite may decrease.



Duration

Colds usually last about seven days. They can occur consecutively.

Uncomplicated viral URI.



Pediatrics. 2013;132(1):e262-e280. doi:10.1542/peds.2013-1071

When Bacterial sinusitis is Presumed?

When a child with an **acute upper respiratory tract infection (URI)** presents with :



Symptoms Worsen

If symptoms unexpectedly get worse after initial improvement. (worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement), **“double sickening,”**



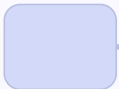
Long Duration

COLD symptoms: nasal discharge [of any quality] or daytime cough or both lasting over 10 days without improvement.



severe onset

(concurrent fever [temperature $\geq 39^{\circ}\text{C}/102.2^{\circ}\text{F}$]
and purulent nasal discharge for at least 3 consecutive days)



St with Severe facial pain or severe headache

Pain usually are ill appearing and need to be distinguished from children with uncomplicated viral infections

Additional Sinusitis Indicators



Eye Swelling

Swelling and dark circles, especially in the morning.



Bad Breath

Persistent bad breath with cold symptoms. Rule out other causes.



Thick Discharge

Nasal discharge remains thick and discolored.

Using stringent criteria to define acute sinusitis, it has been observed that **About 7% of children seeking care for respiratory symptoms** has an illness consistent with this definition

Sequential episodes of uncomplicated viral URI (which may seem to coalesce in the mind of the patient or parent) from the onset of acute bacterial sinusitis with persistent symptoms

Allergic and nonallergic rhinitis

Are predisposing causes of some cases of acute bacterial sinusitis in childhood. Or may be mistaken

- **FHx:** atopic conditions, seasonal occurrences, or occurrences with exposure to common allergens and
- **PMHx:** other allergic diatheses in the index patient (eczema, atopic dermatitis, asthma)
- **S&S:** complaints of pruritic eyes and nasal mucosa, may be a prominent nasal crease, allergic shiners, cobble stoning of the conjunctiva or pharyngeal wall, or pale nasal mucosa.

Diagnosis

- PH Exam: sinus percussion, sinus illumination, Culture ??
- Imaging: Clinicians **should not obtain imaging studies of any kind** to distinguish acute bacterial sinusitis from viral URI, because they do not contribute to the diagnosis; (Evidence Quality: B; Strong Recommendation).
- Finally, Kristo et al performed MRI in children with URIs and confirmed the high frequency (68%) of major abnormalities seen in the paranasal sinuses.
- Indication: a contrast-enhanced computed tomography scan of the paranasal sinuses should be obtained :
- whenever a child is suspected of having orbital or central nervous system complications
- The most common complication of acute sinusitis involves the orbit in children with ethmoid sinusitis who are younger than 5 years.
- Intracranial complications should be suspected in the patient who presents with a very severe headache, photophobia, seizures, or other focal neurologic findings in frontal sinusitis.

Treatment



Should prescribe antibiotic in children with severe onset or worsening course (signs, symptoms, or both)

(Evidence Quality: B; Strong Recommendation).

Increase clinical cures, shorten illness duration, and may prevent suppurative complications in a high-risk patient population.

AND ADJUNCTIVE THERAPY

The clinician should either prescribe antibiotic therapy OR offer additional outpatient observation for 3 days to children with persistent illness (nasal discharge of any quality or cough or both for at least 10 days without evidence of improvement) (Evidence Quality: B; Recommendation).

Antibiotics increase the chance of improvement or cure at 10 to 14 days (number needed to treat, 3–5); but have adverse effects (number needed to harm, 3)

Treatment



- The first-line treatment : **Amoxicillin with or without clavulanate**
- **for mostly 5-7 d unless severe cases**
- Should reassess initial management if either worsening and progression of initial signs/symptoms or appearance of new signs/symptoms) or failure to improve within 72 hours of initial management.
- May change the antibiotic therapy if: the diagnosis is confirmed but worsening symptoms or failure to improve,

The clinician should either prescribe antibiotic therapy OR offer additional outpatient observation for 3 days to children with: persistent illness (nasal discharge of any quality or cough or both for at least 10 days without evidence of improvement) (Evidence Quality: B; Recommendation).

Antibiotics increase the chance of improvement or cure at 10 to 14 days (number needed to treat, 3–5); but have adverse effects (number needed to harm, 3)

Initial Management	Worse in 72 Hours	Lack of Improvement in 72 Hours
Observation	Initiate amoxicillin with or without clavulanate	Additional observation or initiate antibiotic based on shared decision-making
Amoxicillin	High-dose amoxicillin-clavulanate	Additional observation or high-dose amoxicillin-clavulanate based on shared decision-making
High-dose amoxicillin-clavulanate	According to PN allergy, general condition 3 rd generation cephalosporin	Continued high-dose amoxicillin-clavulanate OR According to PN allergy, general condition

- Do not use FluQ as first line
- Macrolides and TMP/SMX are not recommended(30-40% resis for Pneumo/ H. influ)

N.: According to the given information, please answer to the following questions.

N1:

20 m/o boy with FWLS - Toxicity Score : 7/8 ,has pyuria (10-15/HPF), S.G:1.030 and CRP:15mg/dl. U/C:10000 CFU of Klebsiella.

N2:

A 4y/o girl presented for the first time with low grade Fever , +ve nitrate in Urine ,WBC: many / HPF and Growth of >100000 CFU/ml of E.coli sensitive to TMP-SMX and cefixime . The patient isn't toxic.

N3:

7 y/o girl who has had 4 episodes of Cystitis with E.coli sensitive to ordinary Abx. She has infrequent voiding and also BBD.

A. Are the above mentioned findings in these 3 patients compatible with UTI?

B. How can we confirm or rule out the diagnosis of UTI in these cases?

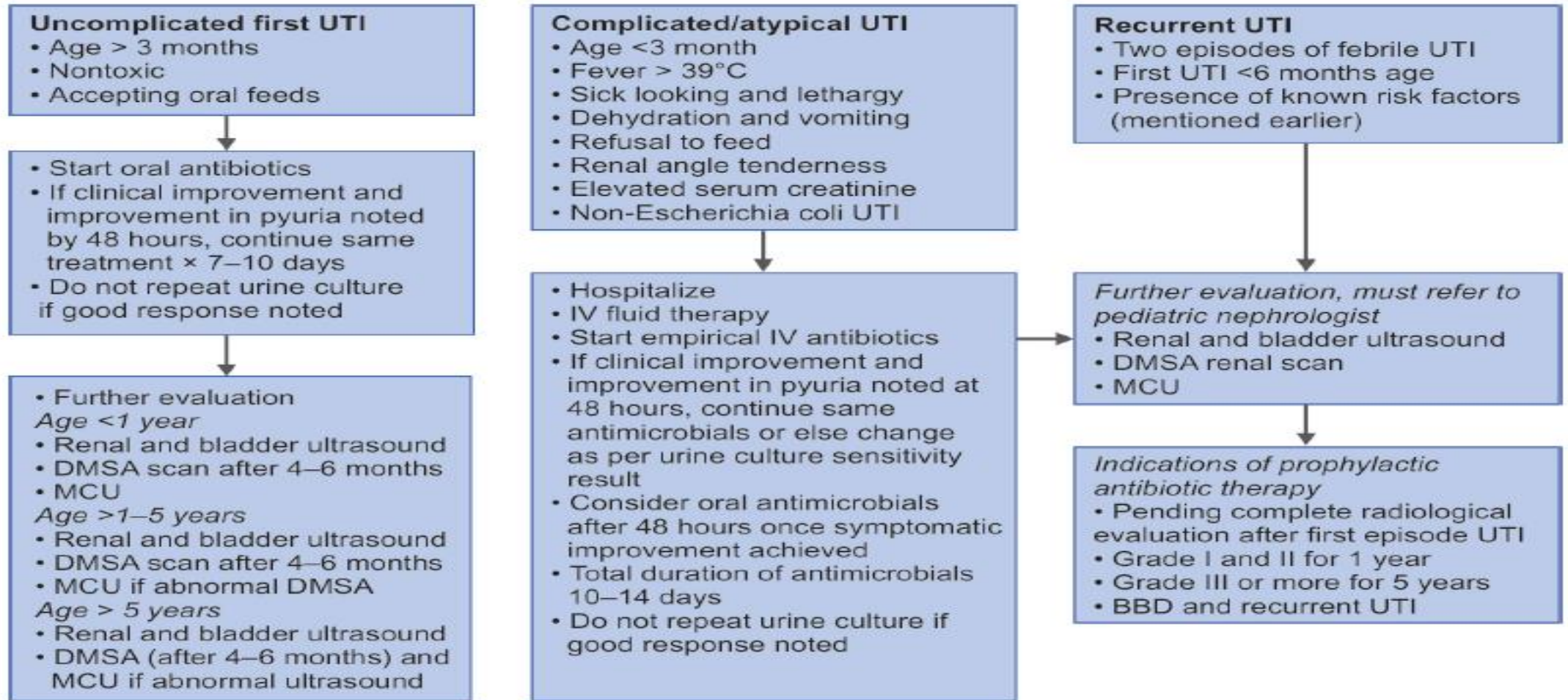
C. In which case do you suggest RBUS ?

D. What are the common treatment options including Abx therapy in case N2 and N3?

OUTPATIENT TREATMENT WHO IS CANDIDATE?

- **Diagnosis** of UTI in young children is made in presence of: **Symptoms** such as fever, dysuria, urgency, frequency, abdominal/flank pain in older children and fever, vomiting, diarrhea, and poor weight gain in infants **PLUS ; Positive dipstick** for leukocyte esterase and nitrite (as a screening tool) ; **Abnormal urinalysis** with significant pyuria and bacteriuria **AND ; Isolation** of single species of microorganism in significant number
- **NOT FOR:** Young infants with high fever, toxic, orally intolerant, CV tenderness, unreliable parents, probable resistant UTI

Flowchart 1: Approach to a child with UTI as per clinical presentation.



•**FOR FIRST GROUP:** ALL SONO, ALL DMSA (FOUR TO SIX MO LATER, U/A, U/C at the end of treatment) LOOK FOR PROTEIN)

VCUG: .3 Inba ASMD fi :ega fo ry evif ot eno .2 EGA FO RY ENO REDNU STNAFNI LLA ROF .1
Inba onos fi :ry evif evoba

Antibiotics

coamoxiclave	45mg /k/d
Farinate	30mg /k/d
Cefixime	10mg /k/d
Cefpodoxime	9mg /k/d
Cotrimoxazole	10mg /k/d
Nitrofurantoin	5mg /k/d
Cephalexin	50or 75mg /k/d
Ciprofloxacin?	20mg /k/d

- LOCAL ANTIMICROBIAL SENSITIVITY MUST BE CONSIDERED

A decade of trends in the distribution and antimicrobial susceptibility of prevalent uropathogens among pediatric patients from Tehran, Iran during 2005-2016, [Ali Reza Nateghian](#), [Sina Karaji](#), [Khosrow Zamani](#)

- . Asian J Urol. . 2021 Jul;8(3):253-259
- . **Results:** In total, 958 female and 349 male positive cultures
- *Escherichia coli* (*E. coli*) (**77.6%**) was the most common causative agent of urinary tract infection (UTI) in children and *Klebsiella pneumoniae* (**10.4%**), *Pseudomonas aeruginosa* (2.4%), and *Enterococcus* spp (2.4%) were less frequent isolated bacteria.
- The resistance rates of *E. coli* isolates were **increased** against **amikacin**, **ceftriaxone**, **ceftazidime**, **ciprofloxacin**, **cotrimoxazole** and **imipenem** from **2005 to 2010**. However, we observed a **decreasing** trend for some of antibiotics including , gentamicin, imipenem, **ceftazidime** and **cotrimoxazole** during 2014-2016.
- resistance was greater in boys

- ;; DURATION OF THERAPY? ?:
- Do not repeat urine culture unless there is a new UTI/breakthrough UTI
- ;; Periodic monitoring of growth
- ;; Urine analysis during further febrile episodes in presence of a known risk factor for UTI
- ;; Blood pressure evaluation once in 6–12 months
- ;; Assess renal function once a year in a child who had severe complicated UTI or recurrent UTI

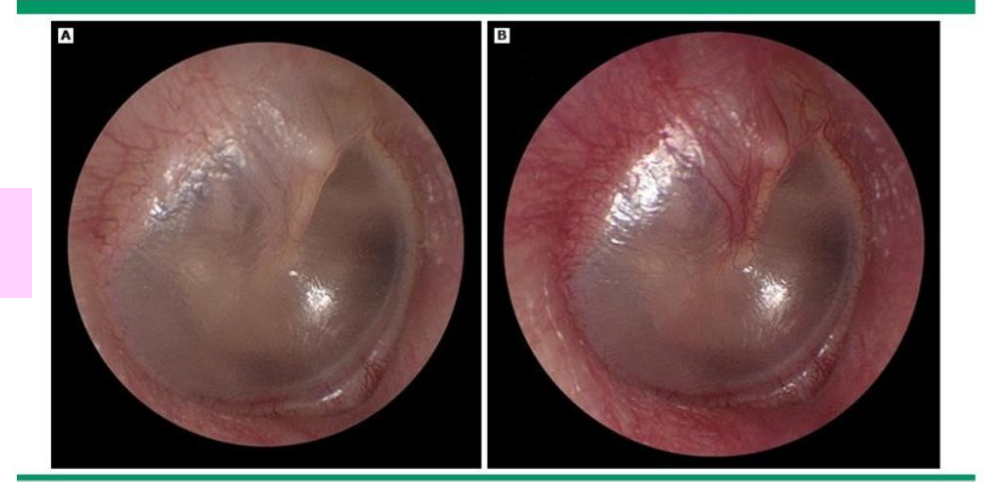
OTHER MEASURES

- **Prophylactic antibiotics** not indicated, unless indicated by specific circumstances:
- ***Risk factors for UTI in young children (look for presence of any of these in your patient):***
 - ; Poor perineal hygiene and unnecessary use of diapers
 - ; Congenital anomalies of kidney and urinary tract (CAKUT) such as vesicoureteric reflux, pelvic ureteric junction obstruction, obstructive uropathy, abnormal communication between urinary tract and gastrointestinal tract, phimosis in boys, vulval synechiae in girls, and renal stone
 - ; Bowel bladder dysfunction (BBD) presenting with features of urinary urgency, frequency, dysuria, voiding postponement during the toilet training age group, incontinence, and constipation
- ; ***Almost 50% children with recurrent UTI and 10% children presenting with a single UTI have an associated urological abnormality***

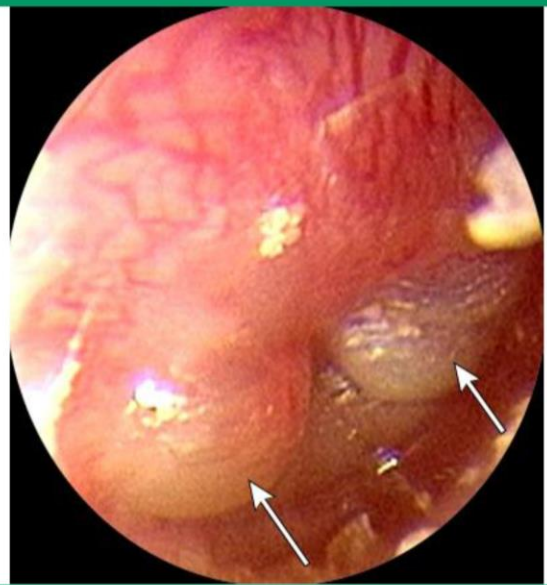
S:According to the following Pictures from TM of 5 patients with fever ,please answer to the questions.

- A. Describe what do you see?
- B. How do you manage these patient?
- C. In which patient do you prescribe antibiotic?

1



4



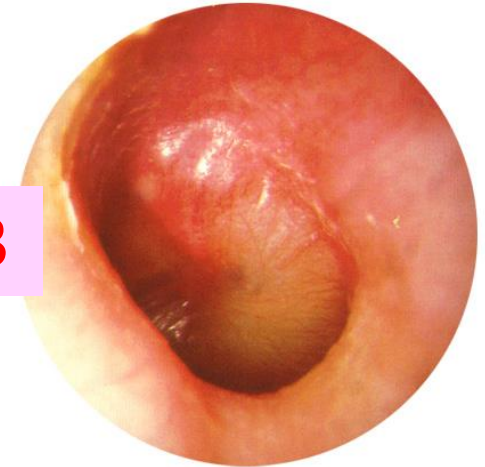
5



2



3



Mobility

- Pneumatic otoscopy

Position

- **Bulging tympanic membrane is the hallmark of AOM**
- PPV 83-99 sensitivity 92%

Translucency

- Does not help differentiate AOM from OME

Color

- **Crying, or high fever and manipulation**
- **Distinct erythema in the absence of bulging or impaired mobility**
PPV 15%

A diagnosis of AOM according to the 2013 guideline should be made in children who present with:

1

- Moderate to severe bulging of the TM

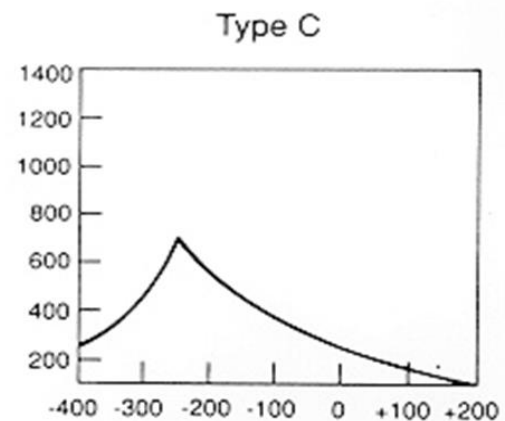
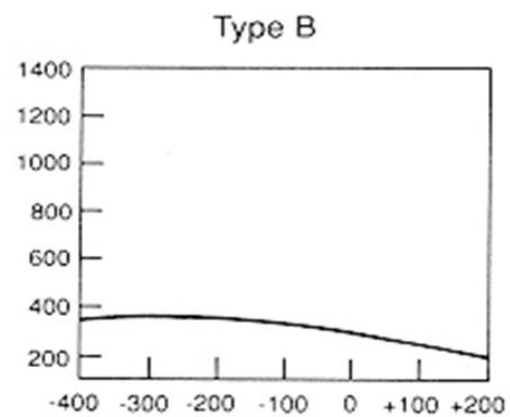
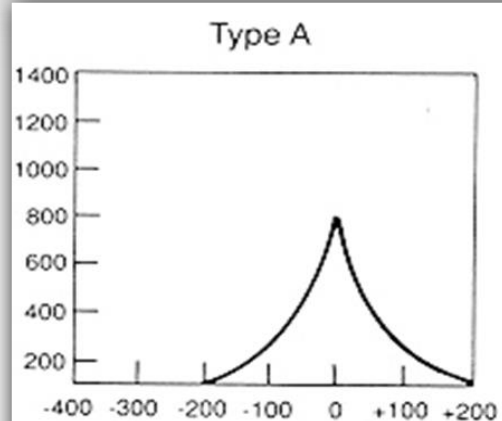
2

- New-onset otorrhea not caused by otitis external

3

- Mild bulging of the TM and recent (<48 hr) onset of ear pain or intense TM erythema

Diagnosis of AOM should *not be made in children without MEE*



Manage pain with analgesic*

and

Assess risk for severe infection, complications, or recurrent AOM

Are there 1 or more of the following risk factors?

- <6 months old
- Immunocompromised
- Toxic appearance
- Craniofacial abnormalities

Children more likely to benefit from immediate antibiotics:

- <2 years old
- Temperature $\geq 39^{\circ}\text{C}$
- Severe pain not improved with analgesia
- Marked bulging of the tympanic membrane 
- Otorrhea (ie, tympanic membrane perforation)
- Bilateral infection
- Symptoms for >72 hours at presentation

Children less likely to benefit from immediate antibiotics:

- ≥ 2 years old
- Temperature $< 39^{\circ}\text{C}$
- Mild to moderate pain improved with analgesia
- Unilateral infection
- Absence of bulging tympanic membrane
- Symptoms for <72 hours at presentation

No penicillin allergy



Treat with either:

- Amoxicillin for most children
- Amoxicillin-clavulanate for those with any of the following:
 - Use of a beta-lactam antibiotic in the past 30 days
 - History of medically confirmed recurrent AOM unresponsive to amoxicillin
 - Concurrent infectious conjunctivitis (based on weak evidence)

IgE-mediated or
serious delayed reaction^Δ



Select 1 of the following:

- Macrolide[§]
- Clindamycin

Mild, non-IgE-mediated reaction[◇]



Select 1 of the following:

- Oral cephalosporin[¥]
- IM ceftriaxone

Symptoms persist or worsen

Image

What was the initial antibiotic?

Amoxicillin

Switch to
amoxicillin-clavulanate[‡]

Amoxicillin-clavulanate
or oral cephalosporin

Switch to either:

- Ceftriaxone (preferred)[‡]
- Levofloxacin (alternative)^{‡†}

Macrolide, clindamycin, ceftriaxone,
or persistent treatment failure

Referral to otolaryngologist
for tympanocentesis

Table 680.3

Suggested Antibiotics for Treatment of Otitis Media and for Patients Who Have Failed First-Line Antibiotic Treatment

INITIAL IMMEDIATE OR DELAYED ANTIBIOTIC TREATMENT

ANTIBIOTIC TREATMENT AFTER 48-72 HR OF FAILURE OF INITIAL ANTIBIOTIC TREATMENT

RECOMMENDED FIRST-LINE TREATMENT

ALTERNATIVE TREATMENT (IF PENICILLIN ALLERGY OR SUSPICION OF β -LACTAMASE-PRODUCING ORGANISMS)

RECOMMENDED TREATMENT

ALTERNATIVE TREATMENT

Amoxicillin (pathogens include *Pneumococcus*, *H. influenzae* non-type B, *Moraxella*)

Cefdinir

Amoxicillin-clavulanate

Ceftriaxone

or

or

or

Amoxicillin-clavulanate
CeftriaxoneCefpodoxime
Ceftriaxone
Levofloxacin (type I hypersensitivity to penicillin)
Clindamycin + third generation cephalosporin
(non-type I hypersensitivity to penicillin)

Ceftriaxone

Tympanocentesis*

ANTIBIOTIC DOSAGE

- Amoxicillin 80-90 mg/kg/day bid for 10 days**
- Amoxicillin-clavulanate (ratio 14:1) 80-90 mg/kg/day of amoxicillin component bid for 10 days**
- Ceftriaxone 50 mg/kg/day daily IM or IV for 1-3 days
- Cefdinir 14 mg/kg/day daily for 10 days**
- Cefpodoxime 10 mg/kg/day bid for 10 days**
- Levofloxacin 20 mg/kg/day bid if ≤ 5 yr for 10 days; 10 mg/kg/day bid if > 5 yr for 10 days

*Tympanocentesis for those who fail second-line therapy.

**Durations of antibiotic therapy may vary based on symptom severity and patient age. For patients 2-5 yr old with mild or moderate disease severity, a 7-day course may be appropriate. For patients 6 yr and older, a 5- to 7-day course may be adequate for mild to moderate symptoms.

IM, Intramuscular; IV intravenous; bid, twice daily.

T.: Two patients presented with bilateral and right C. LAP following F.L.I.

A.What are the key points in Hx and P.Ex?

B.How do you manage them?

C.Do you prescribe Antibiotic for them?

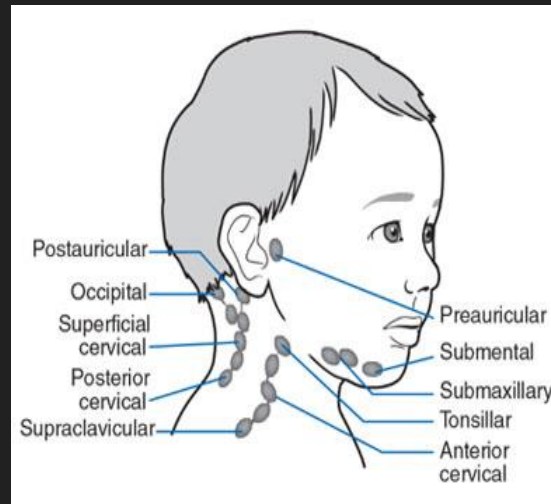
C.If not why ? If yes which Abx?



Infectious

	Isolated	Associated With Generalized Adenopathy
Bacterial		
<i>Staphylococcus aureus</i>	+	-
Group A streptococci	+	+
<i>Mycobacterium tuberculosis</i>	+	+
Nontuberculous mycobacteria	+	-
<i>Bartonella henselae</i>	+	-
Gram-negative enterics	+	-
Anaerobes	+	-
<i>Haemophilus influenzae</i>	+	-
<i>Yersinia pestis</i>	-	+
<i>Actinomyces israelii</i>	+	-
Diphtheria	+	-
Tularemia	+	-
Brucellosis	-	+
Syphilis	+	+
Viral		
Measles	+	+
Rubella	+	+
Epstein-Barr virus	+	+
Herpes simplex	+	-
Human herpesvirus-6	+	+
Cytomegalovirus	+	+
Mumps	+	-
Varicella	+	+
HIV	+	+
Fungal		
Histoplasmosis	+	+
<i>Cryptococcus</i>	+	-
Aspergillosis	+	-
<i>Candida</i>	+	-
Sporotrichosis	+	-
Parasitic		
<i>Toxoplasma gondii</i>	+	+

Etiology



Sedigheh Rafiei Tabatabaei
 Professor of Pediatric Infectious Diseases
 PIRC, RICH
 Mofid Children Hospital
 SBMU

Non-infectious

	Isolated Cervical	Cervical Associated With Generalized Adenopathy
Malignancy		
Hodgkin disease	+	+
Non-Hodgkin lymphomas	+	+
Rhabdomyosarcoma	+	-
Neuroblastoma	+	+
Leukemia	+	+
Metastatic carcinoma	+	-
Thyroid tumors	+	-
Drugs		
Isoniazid	-	+
Phenytoin (Dilantin)	-	+
Serum sickness	-	+
Collagen Vascular Disease		
Juvenile rheumatoid arthritis	-	+
Systemic lupus erythematosus	-	+
Miscellaneous		
Sarcoidosis	-	+
Reticuloendotheliosis	-	+
Sinus histiocytosis with massive lymphadenopathy	+	+
Histiocytosis X	-	+
Postvaccinial	+	-
Storage disorders	-	+
Kawasaki disease	+	+
Hemophagocytic syndrome	-	+
PFAPA syndrome	+	-
Kikuchi-Fujimoto disease	+	+
MISC	+	+
Masses Simulating Adenopathy		
Cystic hygroma	+	-
Branchial cleft cyst	+	-
Thyroglossal duct cyst	+	-
Epidermoid cyst	+	-
Sternocleidomastoid tumor	+	-

Key points in History

Onset, laterality, and duration	Helps to narrow etiology
Constitutional symptoms (eg, weight loss, fatigue, malaise)	Malignancy , Kikuchi disease, Castleman disease, sarcoidosis
Recurrent/chronic cough, hemoptysis	Tuberculosis
Arthritis/arthralgia	Juvenile idiopathic arthritis, SLE
Nasal, aural, or sinus obstruction without drainage	Rhabdomyosarcoma
Immunizations status	MMR, diphtheria (if unimmunized); postvaccination lymphadenitis (if recently immunized, particularly with DTP, polio, or typhoid fever vaccine)
Exposures	
•Ill contacts	•Supports infectious etiology
•Unpasteurized milk	•Brucellosis, <i>Mycobacterium bovis</i>
•Undercooked meats	•Toxoplasmosis
•Animals	•Cats (cat scratch disease, <i>Pasteurella multocida</i> , toxoplasmosis); dogs (<i>P. multocida</i>) rabbits (tularemia); hamster (tularemia); goats (brucellosis); prairie dogs (plague)
•Flea or tick bites	•Plague, tularemia
•Medication-related	•Phenytoin, carbamazepine
•Geographic location or travel	•May need to consider less common causes (eg, tuberculosis , tularemia, plague)

Examination

Lymph node qualities

- Soft, small, round, discrete, mobile, minimally tender
- Isolated, asymmetric, tender, warm, erythematous
- Hard, nontender, fixed, matted to underlying structures
- Hepatosplenomegaly and involvement of noncervical nodes
- Conjunctivitis
- Poor dental hygiene, periodontal disease, dental caries
- Mouth sores/lesions
- Pharyngitis
- Localized skin lesion
- Generalized rash

Case 1- Initial laboratory evaluation and management

Acute bilateral cervical lymphadenitis



-Acute bilateral cervical lymphadenitis is usually caused by a **self-limited viral** upper respiratory infection and requires only monitoring **unless** it is accompanied by severe symptoms, progresses, or persists.

-The condition most commonly represents a transient response to a **benign** local or generalized infection.

-Acute bilateral cervical lymphadenitis is usually caused by a

- ** Viral URTIs

- ** Streptococcal pharyngitis

#testing for GAS is indicated in children with acute bilateral anterior cervical lymphadenitis and exudative pharyngitis.

Case 2- Initial laboratory evaluation and management

Acute unilateral cervical lymphadenitis



Minimal symptoms

Children who are well-appearing and whose LN is only slightly enlarged and minimally tender usually do not require lab testing.

The lymph node should be monitored with serial examinations.

Moderate symptoms

In children with moderate symptoms (eg, fever, warm and/or tender adenitis), start a course of oral antimicrobial therapy after evaluation of children.

Most frequently is caused by infection with *S. aureus* or GAS

Severe symptoms

For most children with severe symptoms (eg, ill-appearing, fever, fluctuant nodes, or concomitant cellulitis), should be hospitalized.

oral therapy

When oral therapy is deemed adequate,

If CA-MRSA is uncommon in the geographic area,

- Penicillinase-resistant penicillins (**Cloxacillin**) or **cephalexin** may be used,
- **cephalexin** 25 to 100 mg/kg per day,
- **Amoxicillin-clavulanic acid**: 45 mg/kg/day, good activity against MSSA and streptococci and anaerobic organisms.

In areas where CA-MRSA is prevalent

If Clindamycin resistance is low,

- **clindamycin** 30 mg/kg/ day, Q 8 h
 - With good activity against anaerobes and MSSA, and many CA-MRSA isolates.
- alternative choices for oral therapy of MRSA infections:
 - **TMP-SMX** 10 mg/kg per day of the trimethoprim component, should not be used initially because they are not active against GAS.

Acute suppurative cervical lymphadenitis

- Most frequently is caused by infection with *S. aureus* or group A streptococci; empiric antimicrobial therapy should be directed against these two agents.
 - In nodes that progress to **abscess formation**, *S. aureus* is the most frequent agent isolated, and drainage is mandatory.
 - Treatment should be continued for **10-14 days** or approximately **5 days** after signs of local inflammation and systemic toxicity have disappeared, whichever is longer.
-
- Children who are receiving appropriate antimicrobial therapy usually manifest decreased inflammation and tenderness of the node and decreased maximum daily temperature **within 48 to 72 hours**.
 - **The size of the LN may not show evidence of regression at this stage**, it may take 4-6 weeks for the LN to regress in size and total resolution of fever should not be expected.
 - Failure to improve within 48 to 72 hours may indicate infection with a resistant organism (eg, methicillin-resistant or clindamycin-resistant *S. aureus*).
 - If not performed previously, needle aspiration or incision and drainage for Gram stain, culture, and susceptibilities may be indicated. It may be necessary to broaden antimicrobial therapy to include coverage for resistant organisms, or less common organisms if clinically indicate.

Note:

Clindamycin resistance is increasing among community *S. aureus* isolates (both MSSA and MRSA), so close clinical follow-up to ensure a therapeutic response has been achieved is **mandatory** when this option is chosen.

Most infants and children with staphylococcal or streptococcal lymphadenitis respond to **orally** administered antimicrobials.

hospitalization

Who need hospitalization?

Patients with

Need for **parenteral** antimicrobial therapy:

- Acute unilateral cervical lymphadenitis with **severe symptoms** (eg, ill-appearing, fever, fluctuant node)
- Acute unilateral cervical lymphadenitis with **moderate symptoms** (eg, fever, nonfluctuant node) that do not respond to or worsen with **oral antimicrobial** therapy

Concomitant cellulitis frequently require parenteral therapy for the first few days

Consideration of Kawasaki disease or MIS-C

Need for incision and drainage



Any comment or Question?