AMPLIFY

Dose Decisions:
Antibiotic Choice, Dose, and Duration in 2026

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Financial Disclosures

- I have no relevant financial relationships to disclose.

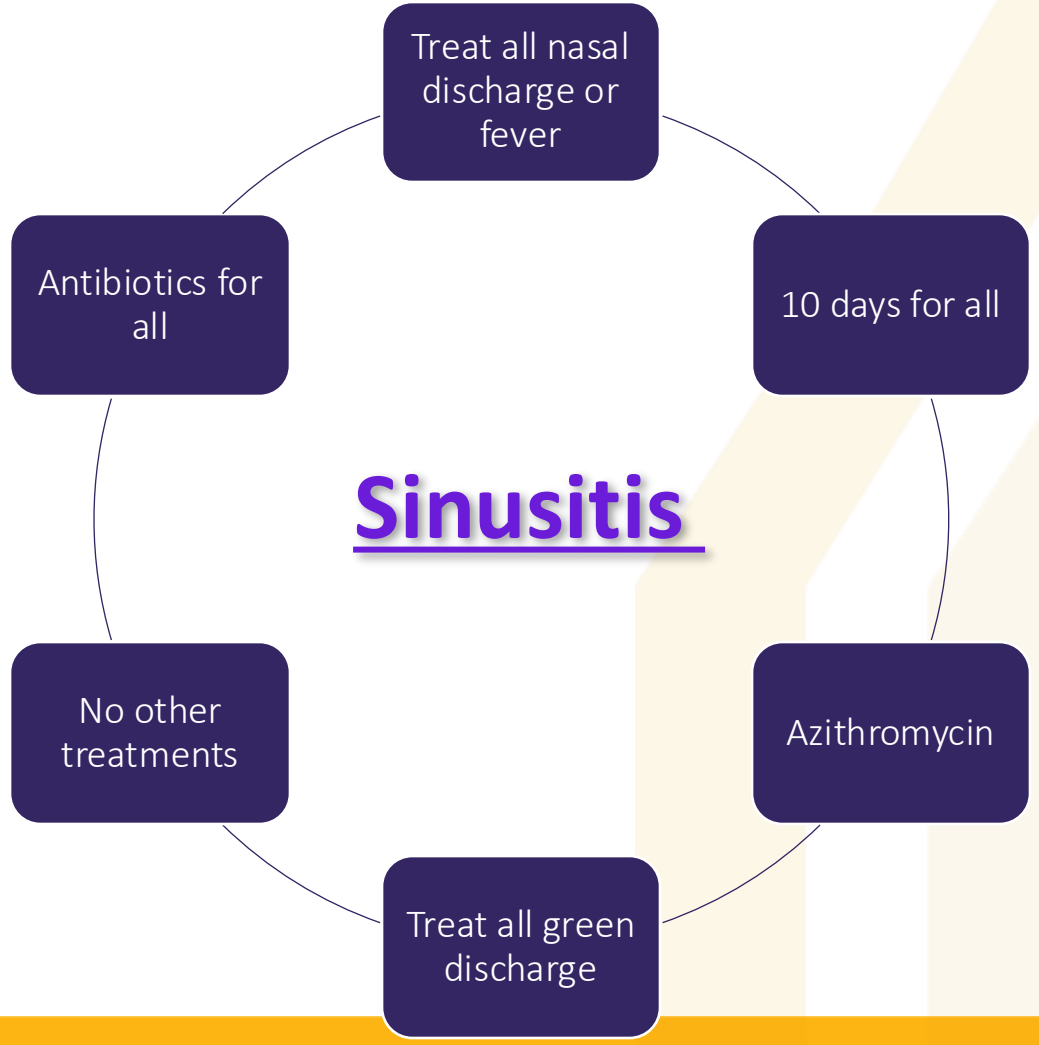
- I will not discuss off label use or investigational use in my presentation.

Dose Decisions:
Antibiotic Choice, Dose, and Duration in 2026

- **Antibiotic Stewardship**
- **Adverse Advents:**
  - 135,900 cases of community acquired C.difficile with no recent hospitalizations annually
  - 143,000 Emergency Department visit each year
- **Resistance**
  - 2 Million infections
  - 23,000 deaths
  - 30 Billion
  - Up to 50% of all outpatient medications maybe inappropriate

Sanchez GV, Core Elements of Outpatient Antibiotic Stewardship. MMWR Recomm Rep. 2016 Nov 11;65(6):1-12

Sinusitis: What Clinicians often do!



Sinusitis

- **Definition**
  - **Persistent Illness**
    - Nasal discharge or daytime cough for 10 days with no improvement
  - **Worsening Course**
    - New or worsening symptoms after initial improvement
  - **Severe Onset**
    - Fever >= 39 and purulent nasal discharge for >= consecutive days
- **Watchful Waiting**
  - Monitor for 3 more days
  - For Persistent Illness
  - Improves Antibiotic Stewardship
- **Nasal discharge**
  - color not predictive of need for antibiotics

Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years.
Pediatrics. 2013. Wald ER, Applegate KE, Bordley C, et al.

Sinusitis

- **Pathogens**:
  - *Streptococcus pneumoniae*,
  - *Haemophilus influenzae*,
  - *Moraxella catarrhalis*
- 2023 RCT Minimal benefit of antibiotics
  - No *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis*
    - *Can reduce antibiotics by 28-53%*
- *Moraxella not associated with treatment benefit*

Identifying Children Likely to Benefit From Antibiotics for Acute Sinusitis: A Randomized Clinical Trial.
The Journal of the American Medical Association. 2023. Shaikh N, Hoberman A, Shope TR, et al.

Sinusitis

- **Immediate Antibiotics:**
  - Severe onset
  - Worsening course
- **Treatment**:
  - First line
  - **Amoxicillin**
    - Less adverse events
  - Caution Amoxicillin with Clavulanate
    - Age<11 Increased treatment failure
      - Study of 200,000 children
  - Shorten symptoms by 2 days (7vs9)
- **Treatment Duration**
  - Usually 10-14 days
  - 7 past symptoms –free
- 2025 Meta-analysis supports 5 days (better studies needed)
- Treatment improvement with in 3 days
- **Treatment Resistance**
  - High Resistance
    - Azithromycin
    - TMP/SMX

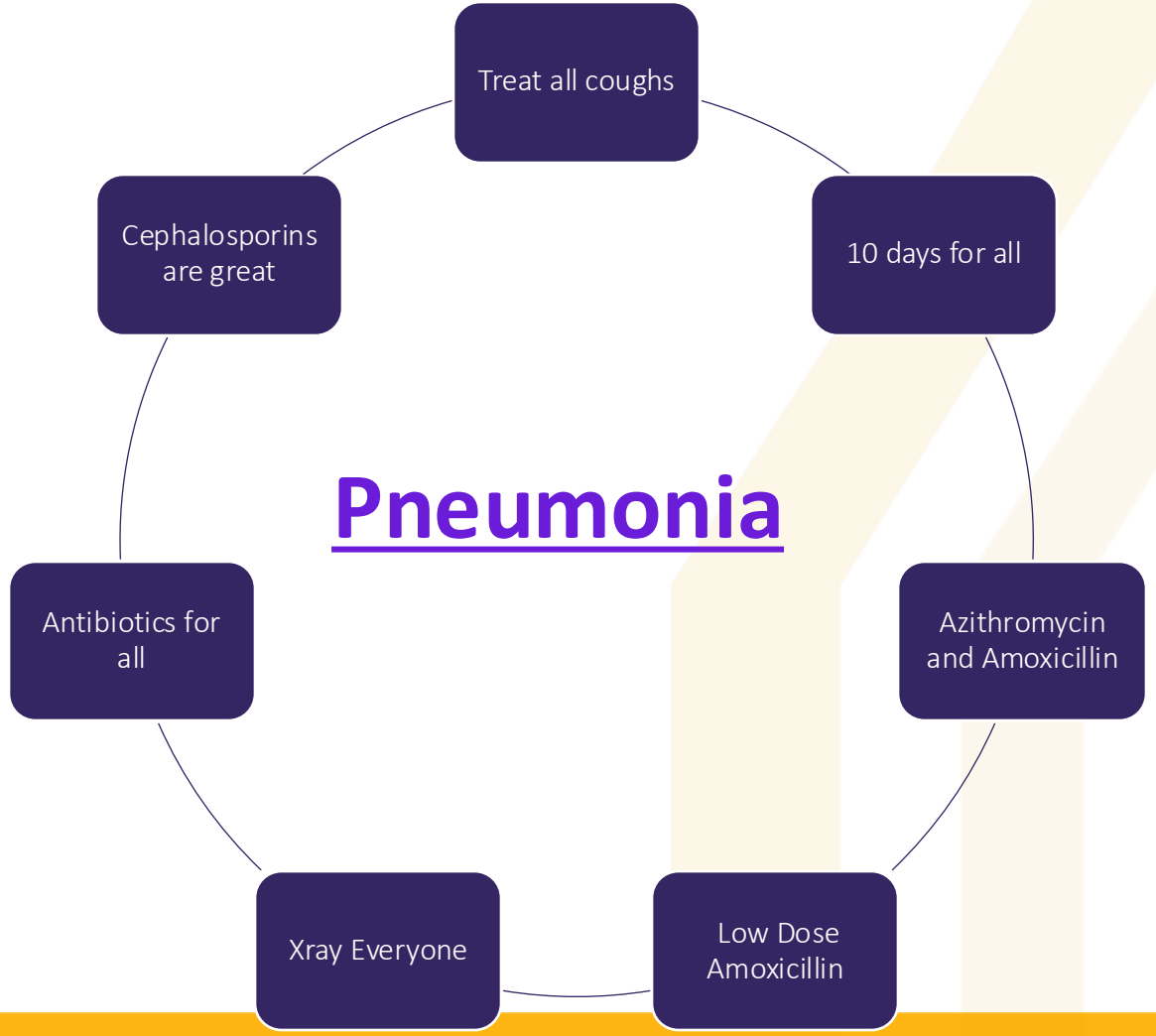
The Evidence Base for the Optimal Antibiotic Treatment Duration of Upper and Lower Respiratory Tract Infections: An Umbrella Review.
The Lancet. Infectious Diseases. 2024. Kuijpers SME, Buis DTP, Ziesemer KA, et al

Sinusitis

Sinusitis		
Watchful Waiting Non-severe	Pathogen Testing	Presumptive Treatment

- **Symptom Relief**
  - Acetaminophen
  - Ibuprofen
  - Nasal/Sinus Saline Irrigation
  - Cool Mist Humidifier/vaporizer
  - Nasal Steroids

Pneumonia: What Clinicians often do!



Pneumonia

- **Typical Pneumonia**
  - Mostly Viral
  - Post PCV 13 generation
  - ABS
- **Treatment**
  - **Amoxicillin** 80-90 mg/kg
    - BID for 5 days
    - TID for Severe
    - Max (1g dose up to 4g/day)
  - 3-5 days for non-severe CAP 2-59 months
  - Cephalosporins
    - Inferior to high dose amoxicillin

Low Dose Amoxil:
PCN resistance improving with PCV

- **PCN allergic**
  - **Clindamycin**
    - 30mg/kg/day TID 5 days
      - (Max 300mg/Dose)
  - Levofloxacin
    - 6mo-5 yr 20mg/kg/day BID 5 days
    - >=5 yr 10mgkg QD for 5 days
      - (Max 500mg QD)
      - Arthritis/tendinitis (~2%) stop if joint pain
      - Caution in Athletes and patients on corticosteroids
- **Severe Illness Consider**
  - **Doxycycline**
    - 4.4mg/kg/day divided BID
    - Max 100mg/dose

Short-Course Antimicrobial Therapy for Pediatric Community-Acquired Pneumonia JAMA 2021
Short- vs Standard-Course Outpatient Antibiotic Therapy for Community-Acquired Pneumonia in Children JAMA 2022

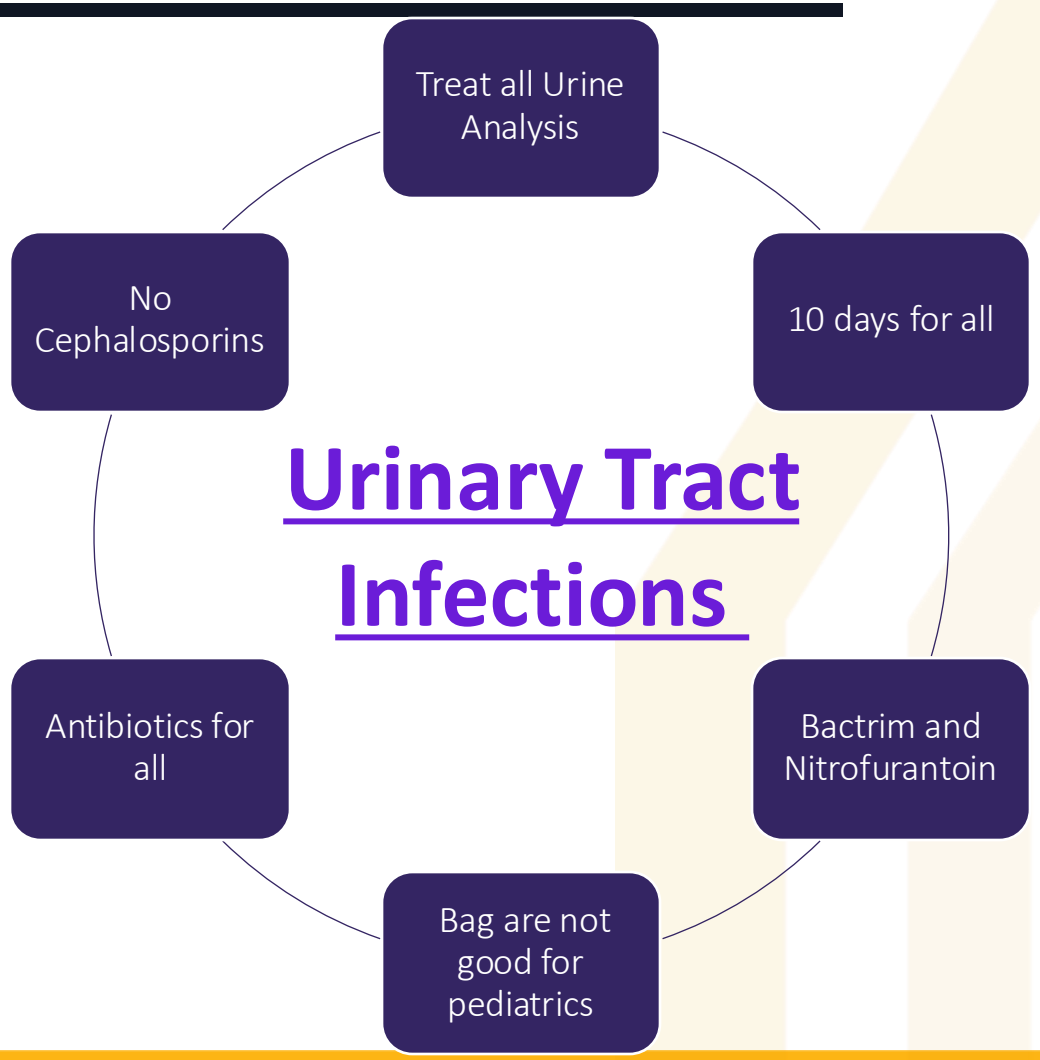
Pneumonia

- **Atypical**
  - **Azithromycin** 10mg/kg day1 then5mg/kg for days 2-5 Max 500mg day1 and 250mg day2-5
  - Swab for atypical
  - Can consider for Lobar during Mycoplasma Outbreaks
- **Xray Confirmed PNA**
  - No significant difference with addition of Azithromycin
- **Biomarkers**
  - Procalcitonin, CRP and Serum Amyloid A
    - Decrease treatment course
    - Antibiotic De-escalation

Short-Course Antimicrobial Therapy for Pediatric Community-Acquired Pneumonia JAMA 2021

Short- vs Standard-Course Outpatient Antibiotic Therapy for Community-Acquired Pneumonia in Children JAMA 2022

UTI: What Clinicians often do!



Urinary Tract Infection

- **Urinary Tract Infections**
  - **Treatment**
    - **First line (**3mo-17yr)
    - **Cephalexin**
      - 50-100mg/kg/day BID or TID
      - Max 500mg /dose
    - Pyelonephritis
      - Cephalexin TID (Can use in pregnancy)
      - Ciprofloxacin
        - 20-40mg/kg/day BID
        - Max 500mg dose or 1000mg ER per day
  - **First Line** (>=18)
  - **Nitrofurantoin**
  - Cephalexin poorly studied and concerns for inferior efficacy and increase adverse effects
  - Cephalexin
    - < 2y.o. and
      - Febrile, Recurrent UTI, Renal tract abnormality or signs of pyelonephritis
        - 7-10 days, TID dosing
    - ≥ 2 y.o. and
      - Afebrile without signs of pyelonephritis
        - 3-5 days, BID dosing

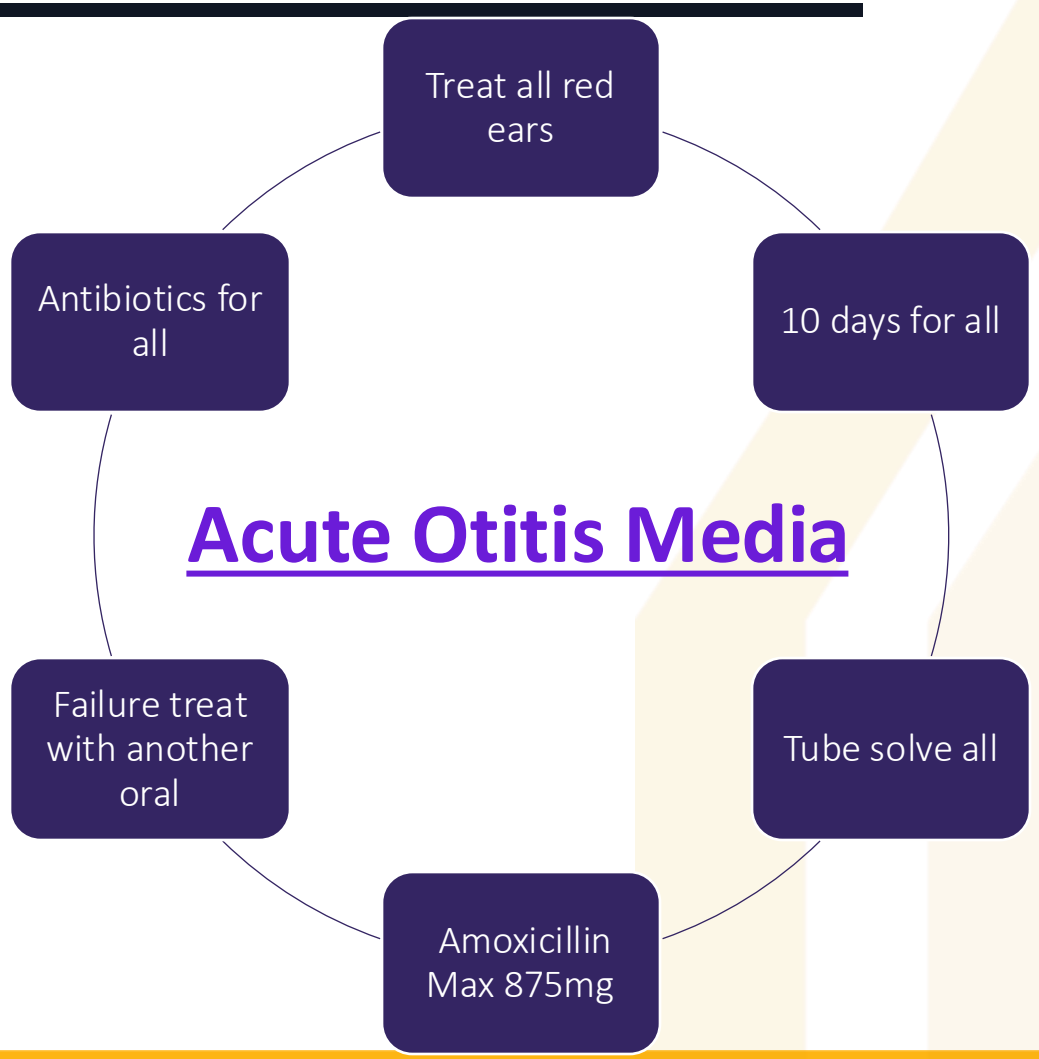
Short Oral Antibiotic Therapy for Pediatric Febrile Urinary Tract Infections: A Randomized Trial. Pediatrics 2024 Jan 1;doi: 10.1542/peds.2023-062598.

Urinary Tract Infection

- **Urinary Tract Infections**
  - **Treatment**
- **Allergic**
  - **Nitrofurantoin**
    - 5-7mg/kg/day divided q6h
    - Max 50mg dose or 100mg ER bid Macrobid
  - Ciprofloxacin (not in pregnant or on steriods)
    - 20-40mg/kg/day BID
    - Max 500mg dose or 1000mg ER per day

Short Oral Antibiotic Therapy for Pediatric Febrile Urinary Tract Infections: A Randomized Trial. Pediatrics 2024 Jan 1;doi: 10.1542/peds.2023-062598.

Acute Otitis Media: What Clinicians often do!



Acute Otitis Media

- **Treatment Changes**
  - Shorten the Duration of the treatment course
  - 80% are Viral Illness
  - **Watchful waiting Protocol**
  - Start Treatment if any
    - < 6 months
    - 6-23 months and bilateral
    - Positive in Watchful Waiting

<u>Watchful Waiting</u>

Fever of 102,
Severe Pain or
Pain>2 days

Tympanostomy VS
Episodic Antibiotics Treatment

Same incidence within 2 years

American Academy of Pediatrics Clinical Practice Guideline: The Diagnosis and Management of Acute Otitis Media. Pediatrics. 2013;131(3):964-999

Acute Otitis Media

- **Acute Otitis Media**
- **Treatment**
- **First Line**
  - **Amoxicillin**
    - <3 mo 30mg/kg/day divided bid
    - >3 months80-90 mg/kg/day
    - Max 1000mg per dose

Duration of Treatment

Age < 2 yo = 10 days

Age 2 yo - 5 yo = 7 days

Age > 6 yo = 5 days

- **Allergic**
- **Non PCN anaphylaxis**
  - **Cefdinir**
    - 14mg/kg qd/bid
    - max 300mg bid
- **Anaphylaxis**
  - **Azithromycin**
    - 10mg qd for 3 days
    - max 500mg/dose
  - Clindamycin
    - 30mg/kg divide tid
    - max 300mg /dose

Otitis Media in Young Children.
The New England Journal of Medicine. 2025. Shaikh N.New

Acute Otitis Media

- Otitis Failure
- or with conjunctivitis
  - Amoxicillin and clavulanate (ES600)
    - 90mg/kg divide bid
    - max 1 g
- Failure of Oral (Twice)
  - Ceftriaxone
    - 50mg/kg IM qd x 3
    - Max 1 g/dose

Xylitol may reduce Recurrent AOM

Otitis Media in Young Children.
The New England Journal of Medicine. 2025. Shaikh N.New

Skin and Soft Tissue Infection: What Clinicians often do!

Skin and Soft Tissue Infection

- **Skin and Soft Tissue Infection**
- Impetigo
  - **Mupirocin bid**
  - >1 lesion
  - **Cephalexin** 50mg /kg/day tid
  - Max 500mg /dose
- Cellulitis
  - **Cephalexin** TID for 5 days
- Abscess **Culture** Lack of evidence for Superficial SST Abscess
  - **Cephalexin** TID 5 days

Duration of Treatment
5-7 days

Incision & drainage primary therapy

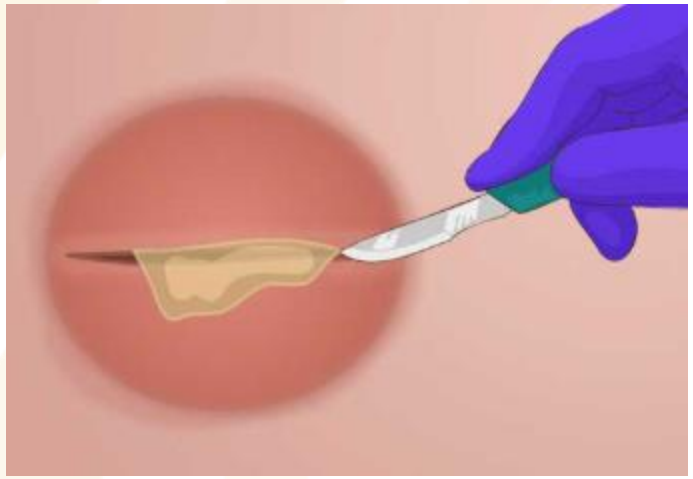
- **H/o MRSA**
  - **Clindamycin**
    - 30mg/kg/day divided tid
    - max 300mg /dose
  - TMP/SMX
    - 8-12 mg/kg/day Based on TMP component divided bid
    - max 160mg BID WARNING

Wiltrakis SM, etal. Optimizing Antibiotic Treatment of Skin Infections in Pediatric Emergency and Urgent Care Centers. Pediatrics. 2022 Oct 1; PMID: 36073197.

Skin and Soft Tissue Infection

- **Antibiotics Not Needed**
- Impetigo
  - Uncomplicated
- Paronychia
  - Less than 2 cm
  - No Cellulitis
- Abscesses
  - Drained well
  - Small (Less than 2-5 cm)

Incision & drainage primary therapy



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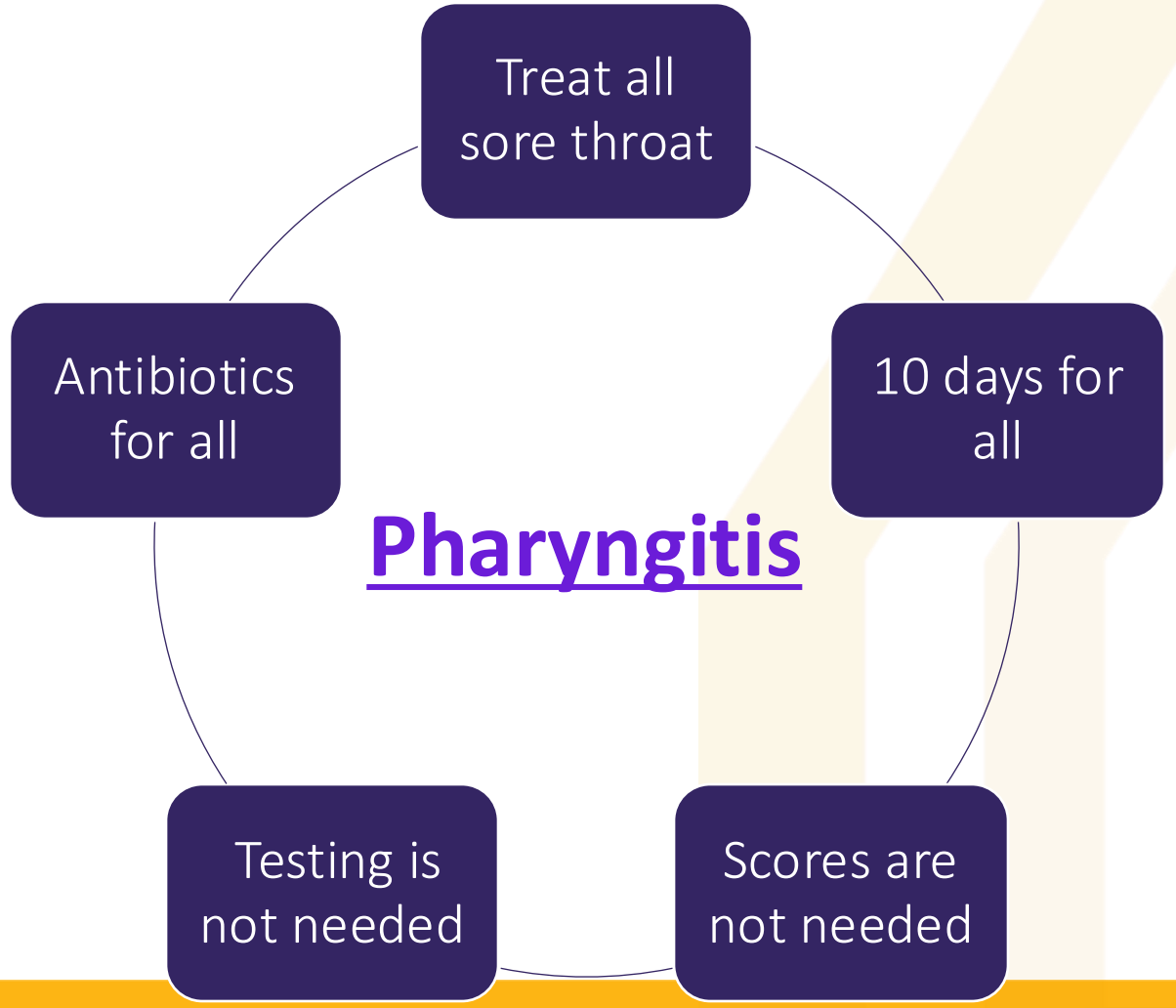
Pharyngitis : What Clinicians often do!



Pharyngitis

- **Pharyngitis**
- **First line**
  - **Amoxicillin**
    - 50mg/kg QD for 10 day
    - max 1g
  - **Cephalexin**
    - 25-50 mg/kg divide bid x 10 days
    - max 500mg per dose
- **PCN Allergic**
- **Non-Anaphylaxis**
  - **Cefdinir**
    - 14 mg /kg day qd x10 days BID x5 days
    - max 300mg dose

Strep Score for all

Good Evidence 5-7 days

Do we need to Treat at all ?

- **Anaphylaxis**
  - **Azithromycin**
    - 12mg/kg/day
    - max 500mg
- **Adolescent**
  - **Azithromycin**
    - 12mg/kg day 1 then 6mg/kg day 2-5
    - Max day one 500 max day 2-5 250

Linder JA, et al. 2025 Clinical Practice Guideline Update by the IDSA on Group A Streptococcal (GAS) Pharyngitis: Risk assessment using clinical scoring systems in children and adults. Clin Infect Dis. 2025 Dec 4 PMID: 41343363.

Pharyngitis

- **Failure in last 30 days**
- **Augmentin**
  - 25-45 mg/kg/day divided bid
  - max 875mg bid
- Cefdinir
- Clindamycin
  - 30mg/kg/day divided tib
  - mx 300mg/dose
- All for 10 days

Linder JA, et al. 2025 Clinical Practice Guideline Update by the IDSA on Group A Streptococcal (GAS) Pharyngitis: Risk assessment using clinical scoring systems in children and adults. Clin Infect Dis. 2025 Dec 4 PMID: 41343363.

Dose Decisions:
Antibiotic Choice, Dose, and Duration in 2026

- **Trimethoprim Sulfamethoxazole**
- TMP/SMX and Respiratory Failure
- JAMA 2025 Nov
- Cohort Study 750,000
- **Absolute Risk Low**
  - Number needed to harm 4-5,000
- **Population**
  - Age 10-<25
  - Previously healthy Individuals
- **Occurs within days to weeks**

- **Presentation**
  - Severe Shortness of breath
  - Tachypnea
  - Hypoxemia
  - Progression to Respiratory failure
- **Support**
  - Mechanical Ventilation,
  - ECMO
  - Lung Transplant
- **Mortality in reported cases ~40%**
- **Genetics**
  - 100% HLA-B07:02 & HLA-C07:02

Ahmadi F et al, Trimethoprim-Sulfamethoxazole and Acute Respiratory Failure in Adolescents and Young Adults. JAMA Netw Open. 2025 Nov PMCID: PMC12645330.

Take Away Point

1) **Most Likely Not Bacterial**
2) **Less is More**
3) **Laser not Grenade**
4) **Medicine always Change**

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