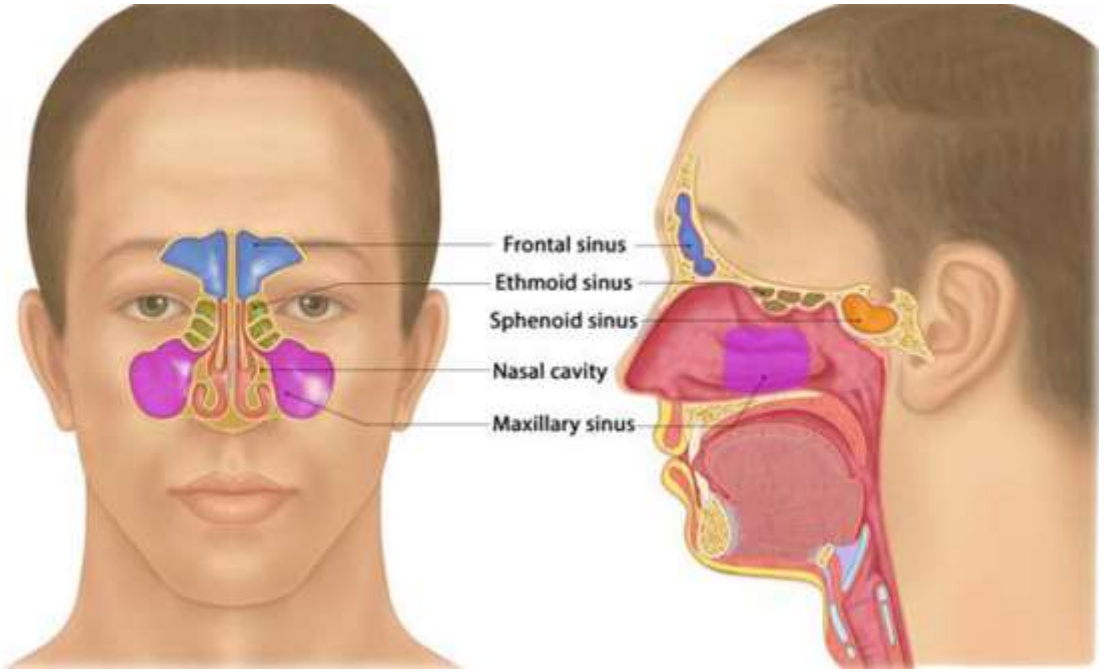
Rhinosinusitis

General Principles:

✓ Sinusitis is an inflammation and/or infection of the paranasal sinuses around the nose.

✓ Rhinosinusitis is preferred because sinusitis typically also involves the nasal mucosa.

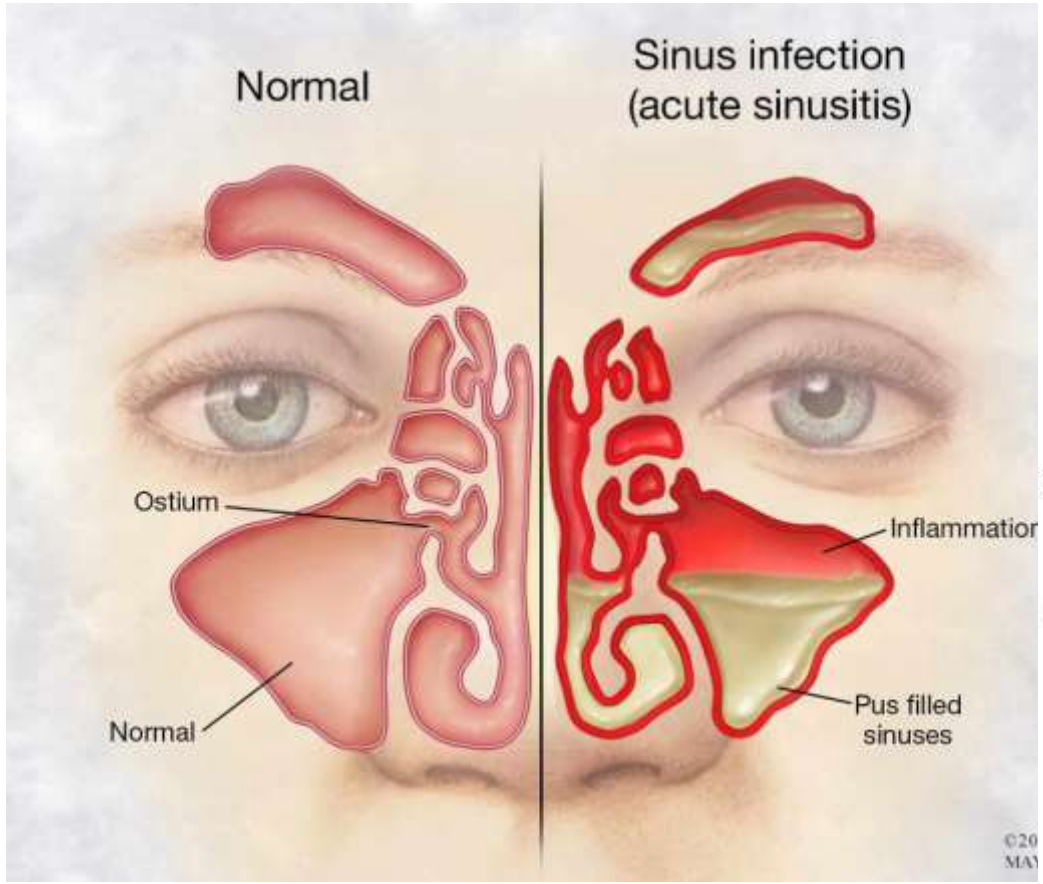


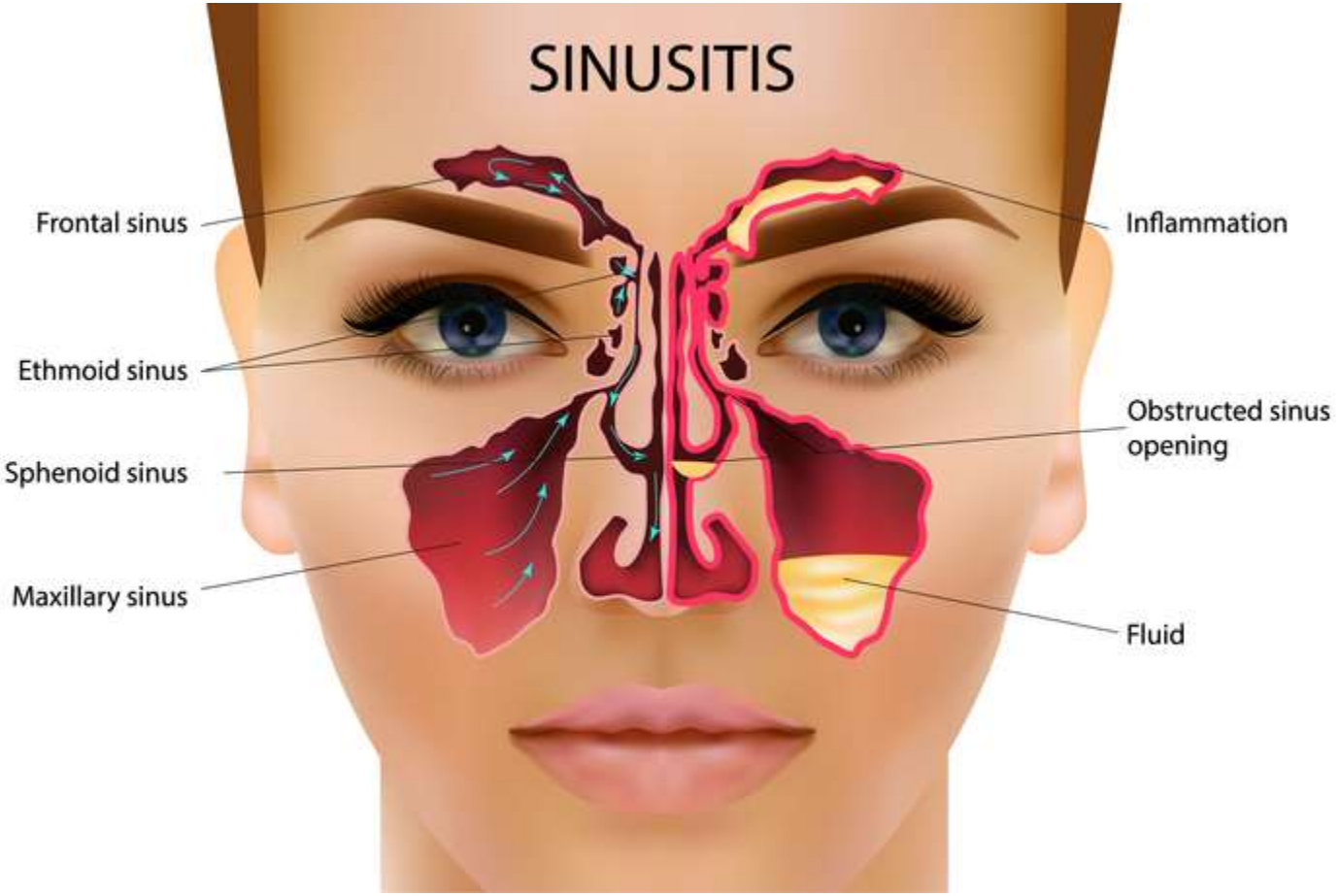
✓ Acute rhinosinusitis:

- Most frequently caused by upper respiratory viruses

- Bacterial pathogens (S. pneumoniae, H. influenzae, M. catarrhalis & anaerobes): < 2% of cases, should be considered only if symptoms persist for > 10 days

- Acute bacterial rhinosinusitis is often preceded by a viral respiratory tract infection that causes mucosal inflammation →obstruction of sinus ostia (pathways that drain the sinuses)


Normal
Sinus infection
(acute sinusitis)
Ostium
Inflammation
Normal
Pus filled
sinuses


SINUSITIS
Frontal sinus
Ethmoid sinus
Sphenoid sinus
Maxillary sinus
Inflammation
Obstructed sinus
opening
Fluid

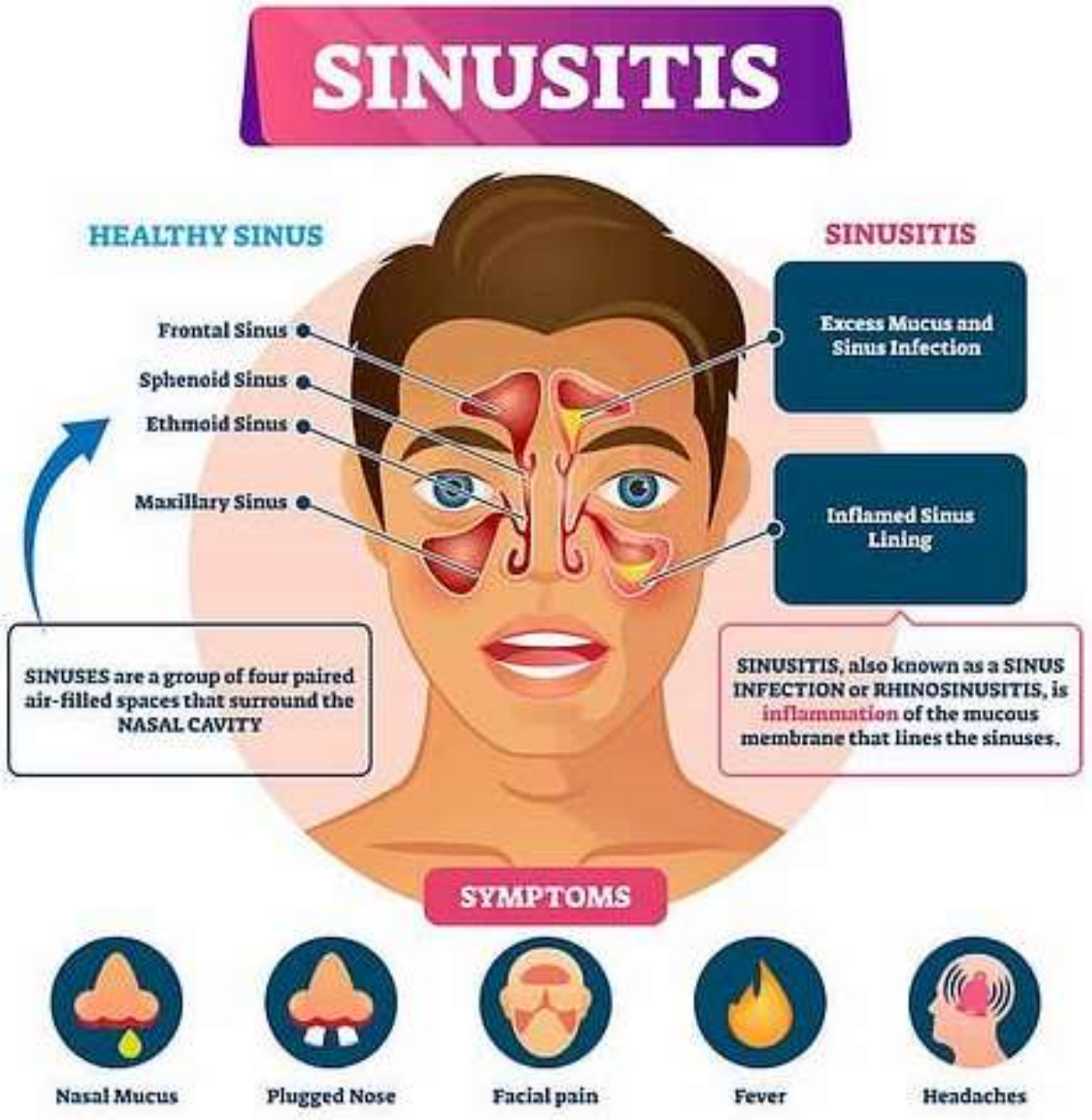
- ✓ Chronic rhinosinusitis:
  - may be caused by any of the etiologic agents responsible for acute sinusitis, as well as S. aureus, Corynebacterium diphtheriae, and many anaerobes.
  - Possible contributing factors include asthma, nasal polyps, allergies, or immunodeficiency.
  - The pathogenesis of chronic rhinosinusitis has not been well studied (caused by more persistent pathogens or a subtle defect in the host’s immune function)

Diagnosis:

✓ Clinical Presentation:

- Acute rhinosinusitis presents with purulent nasal discharge, nasal obstruction, facial or dental pain, and sinus tenderness with or without fever, lasting < 4 weeks.

- Chronic rhinosinusitis is defined by symptoms lasting > 12 weeks including mucopurulent drainage, nasal obstruction, facial pain or pressure, and decreased sense of smell with documented signs of inflammation.



CLINICAL PRESENTATION

Acute Bacterial Rhinosinusitis

General

- There are three clinical presentations that are most consistent with acute bacterial versus viral rhinosinusitis:
  - Onset with *persistent* signs or symptoms compatible with acute rhinosinusitis, lasting for ≥10 days without any evidence of clinical improvement
  - Onset with *severe* signs or symptoms of high fever (≥39°C [102.2°F]) and purulent nasal discharge or facial pain lasting for at least 3 to 4 consecutive days at the beginning of illness
  - Onset with *worsening* signs or symptoms characterized by new-onset fever, headache, or increase in nasal discharge following a typical viral URI that lasted 5 to 6 days and were initially improving ("double sickening")

Signs and Symptoms

- Purulent anterior nasal discharge, purulent or discolored posterior nasal discharge, nasal congestion or obstruction, facial congestion or fullness, facial pain or pressure, fever, headache, ear pain/pressure/fullness, halitosis, dental pain, cough, and fatigue

Data from Reference 15.

A diagnosis of acute bacterial rhinosinusitis requires persistent symptoms (≥10 d), severe symptoms at the beginning, worsening of symptoms after 10 days, or worsening after initial improvement.

✓ Diagnostic Testing:

- Diagnosis requires objective evidence of mucosal disease, usually with rhinoscopy and nasal endoscopy.

Treatment:

✓ The goals of medical therapy for acute and chronic rhinosinusitis are to:

- Control infection
- Reduce tissue edema
- Facilitate drainage
- Achieve and maintain patency of the sinus ostia
- Limit antibiotic treatment to those who may benefit
- Break the pathologic cycle that leads to chronic sinusitis

✓ Acute rhinosinusitis:

- Symptomatic treatment is the mainstay of therapy.

- Management of nonbacterial rhinosinusitis (for symptomatic relief):
  - ➢ Nasal decongestant spray (use no more than 3 days)
  - ➢ Oral decongestants may also aid in nasal/sinus patency
  - ➢ Irrigation of nasal cavity with saline & steam inhalation (increase mucosal moisture)
  - ➢ Mucolytics (eg, guaifenesin) may be used to decrease the viscosity of nasal secretions

- Acute bacterial rhinosinusitis;

➢ Decongestants & antihistamines: not recommended (can dry mucosa & disturb clearance of mucosal secretions)

➢ Intranasal saline irrigation https://youtu.be/xodfPieoUZU

➢ Intranasal corticosteroids: recommended only for patients with a history of allergic rhinitis.

- AAO-HNSF guidelines: watchful waiting, without antibiotics (amoxicillin), unless symptoms fail to improve within 7 days.
- IDSA guidelines support amoxicillin-clavulanate as first-line treatment, without watchful waiting.
- Empiric antibiotic therapy is indicated only for severe persistent symptoms (≥ 10 days) or failure of symptomatic therapy.
- First-line therapy: amoxicillin-clavulanate (875 mg/ 125 mg PO q12h). No other antibiotics are recommended as first-line for initial empirical therapy.
- Doxycycline or a respiratory fluoroquinolone (e.g., moxifloxacin, levofloxacin) may be used as alternative therapy in case of β-lactam allergy or primary treatment failure.
- TMP-SMX & macrolides: not recommended for empiric therapy (high rates of resistance).
- Cephalosporins are no longer recommended as monotherapy (variable rates of resistance).

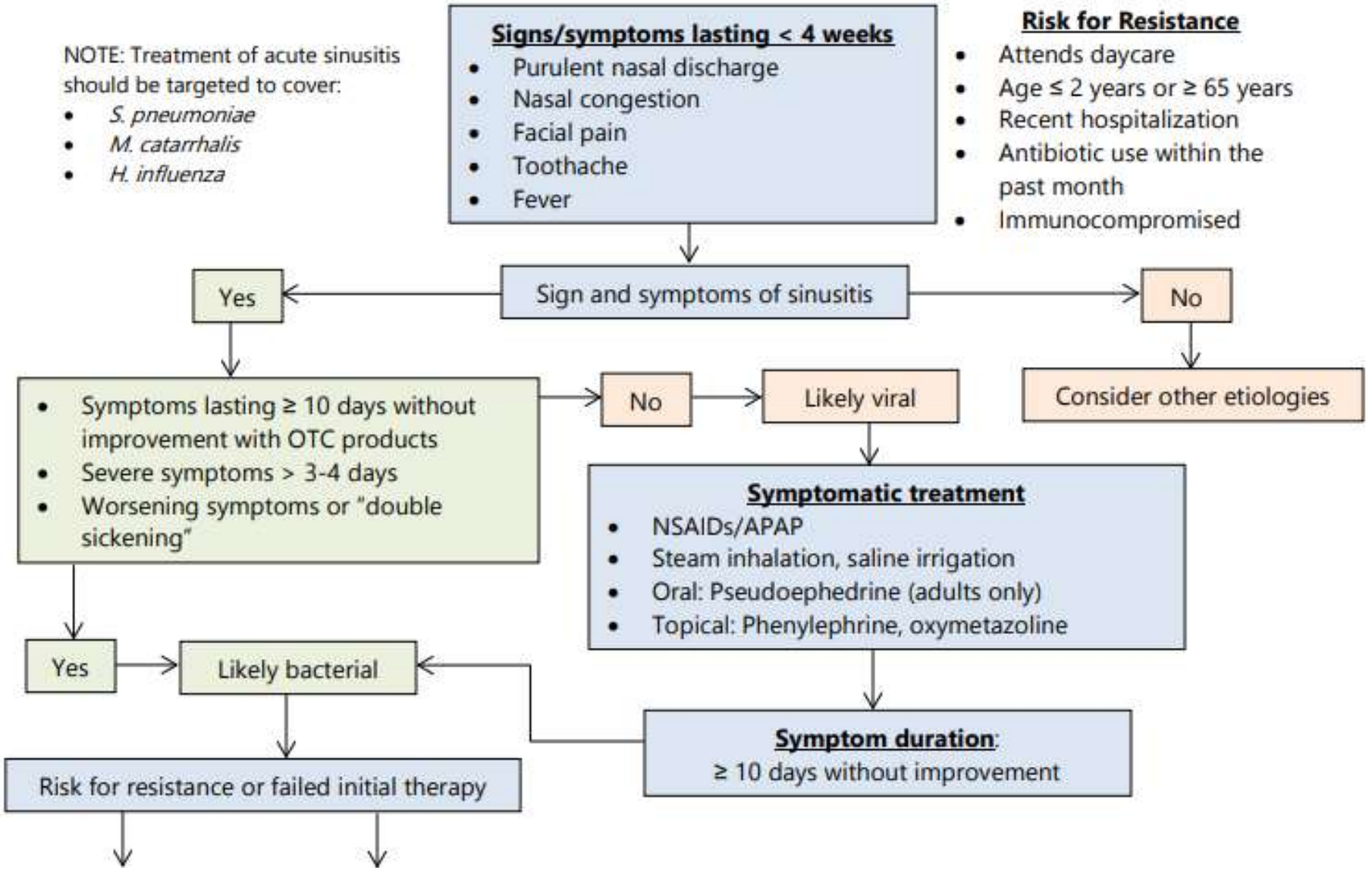
- High-dose amoxicillin-clavulanate is preferred in the following situations:

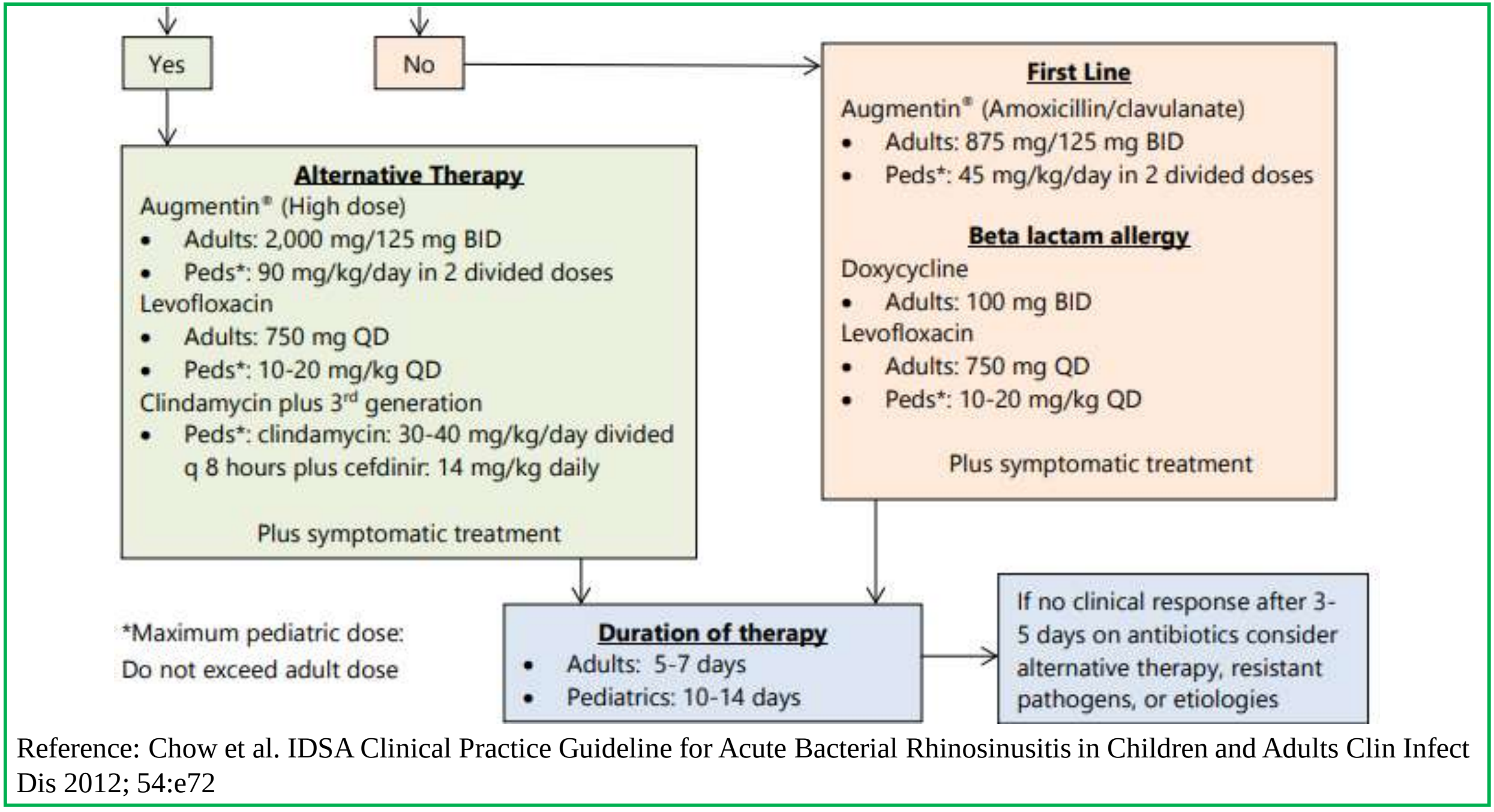
  - Regions of high endemic rates (≥10%) of invasive penicillin-nonsusceptible S. pneumoniae
  - severe infection: systemic toxicity with fever of ≥ 39°C
  - attendance at daycare
  - age less than 2 or greater than 65 years
  - recent hospitalization
  - antibiotic use within the last month
  - immunocompromised persons.

- The duration of therapy (acute bacterial rhinosinusitis) is 10- to 14-day antibiotic courses in children. For adults, the recommended duration is only 5 to 7 days.

- If symptoms persist or worsen after 48 to 72 hours of appropriate antibiotic therapy, then the patient should be reevaluated and alternative antibiotics should be considered.

Acute Sinusitis for Adult and Pediatric Patients Algorithm





Reference: Chow et al. IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and Adults Clin Infect Dis 2012; 54:e72

- ✓ Chronic rhinosinusitis:
  - Treatment usually includes topical and/ or systemic glucocorticoids.

  - The role of antimicrobial agents is unclear. If they are used, amoxicillin-clavulanate is the first-line treatment, with clindamycin for penicillin-allergic patients.

TABLE 126-3 Antibiotics and Doses for Acute Bacterial Rhinosinusitis in Adults

Antibiotic	Brand Name	Dose	Comments
Initial Empirical Therapy			
Amoxicillin-clavulanate	Augmentin®	500 mg/125 mg orally three times daily, or 875 mg/125 mg orally twice daily	First line
Amoxicillin-clavulanate	Augmentin®	2,000 mg/125 mg orally twice daily	Second line
Doxycycline		100 mg orally twice daily or 200 mg orally once daily	Second line
β-Lactam Allergy			
Doxycycline		100 mg orally twice daily or 200 mg orally once daily	
Levofloxacin	Levaquin®	500 mg orally once daily	
Moxifloxacin	Avelox®	400 mg orally once daily	
Risk for Antibiotic Resistance or Failed Initial Therapy			
Amoxicillin-clavulanate	Augmentin®	2,000 mg/125 mg orally twice daily	
Levofloxacin	Levaquin®	500 mg orally once daily	
Moxifloxacin	Avelox®	400 mg orally once daily	
Severe Infection Requiring Hospitalization			
Ampicillin-sulbactam	Unasyn®	1.5-3 g IV every 6 hours	
Levofloxacin	Levaquin®	500 mg orally once daily	
Moxifloxacin	Avelox®	400 mg orally once daily	
Ceftriaxone	Rocephin®	1-2 g IV every 12-24 hours	
Cefotaxime	Claforan®	2 g IV every 4-6 hours	

Data from Reference 15.

TABLE 126-2 Antibiotics and Doses for Acute Bacterial Rhinosinusitis in Children

Antibiotic	Brand Name	Dose	Comments
Initial Empirical Therapy			
Amoxicillin-clavulanate	Augmentin®	45 mg/kg/day orally twice daily	First line
Amoxicillin-clavulanate	Augmentin®	90 mg/kg/day orally twice daily	Second line
β-Lactam Allergy			
Clindamycin plus cefixime or cefpodoxime	Cleocin®, Suprax®, Vantin®	Clindamycin (30-40 mg/kg/day orally three times daily) plus cefixime (8 mg/kg/day orally twice daily) or cefpodoxime (10 mg/kg/day orally twice daily)	Non-type 1 allergy
Levofloxacin	Levaquin®	10-20 mg/kg/day orally every 12-24 hours	Type 1 allergy
Risk for Antibiotic Resistance or Failed Initial Therapy			
Amoxicillin-clavulanate	Augmentin®	90 mg/kg/day orally twice daily	
Clindamycin plus cefixime or cefpodoxime	Cleocin®, Suprax®, Vantin®	Clindamycin (30-40 mg/kg/day orally three times daily) plus cefixime (8 mg/kg/day orally twice daily) or cefpodoxime (10 mg/kg/day orally twice daily)	
Levofloxacin	Levaquin®	10-20 mg/kg/day orally every 12-24 hours	
Severe Infection Requiring Hospitalization			
Ampicillin-sulbactam	Unasyn®	200-400 mg/kg/day IV every 6 hours	
Ceftriaxone	Rocephin®	50 mg/kg/day IV every 12 hours	
Cefotaxime	Claforan®	100-200 mg/kg/day IV every 6 hours	
Levofloxacin	Levaquin®	10-20 mg/kg/day IV every 12-24 hours	

Data from Reference 15.