

Rhinosinusitis

التهاب الجيوب الأنفية

General Principles:

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

بالعادة يكون سببه ال
infection أو inflammation

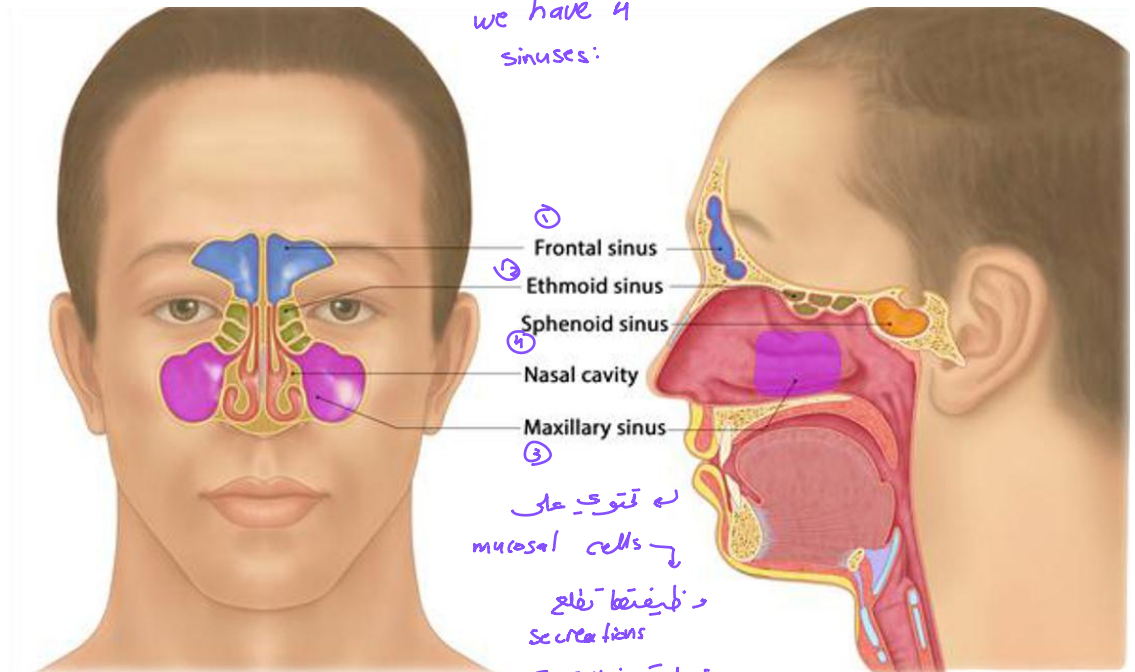
✓ Rhinosinusitis is preferred because sinusitis typically also involves the nasal mucosa.

✓ Acute rhinosinusitis:

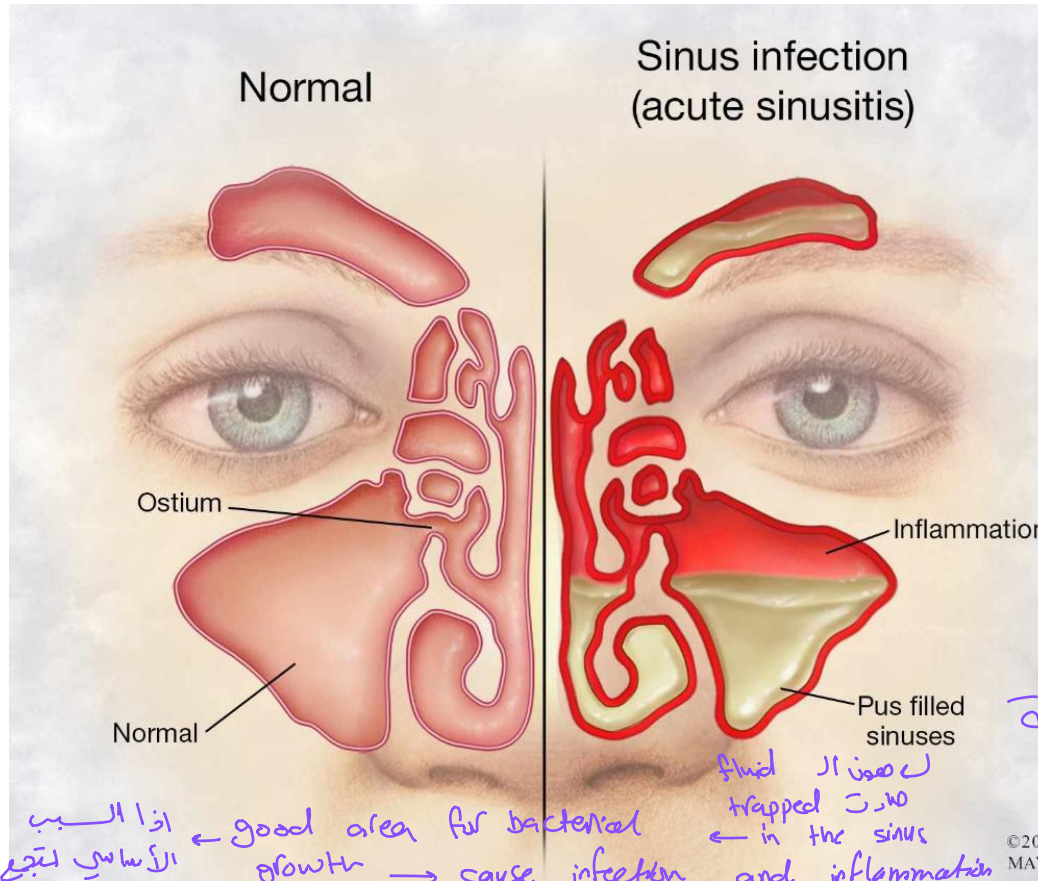
- Most frequently caused by upper respiratory viruses
- Bacterial pathogens (*S. pneumoniae*, *H. influenzae*, *M. catarrhalis* & anaerobes): < 2% of cases, should be considered only if symptoms persist for > 10 days
- Acute bacterial rhinosinusitis is often preceded by a viral respiratory tract infection that causes mucosal inflammation → obstruction of sinus ostia (pathways that drain the sinuses)

لأن الأعران لـ Rhinosinosis تكون حادة أكثر من ما أياها بالغالبي السبب bacterial

لأن يسبق ال bacterial بالعادة viral infection



Any viral infection cause inflammation (Redness, swelling) → close of fluid draining in the nose
 → fluid trapped → good area for bacterial growth → Rhinosinosis.



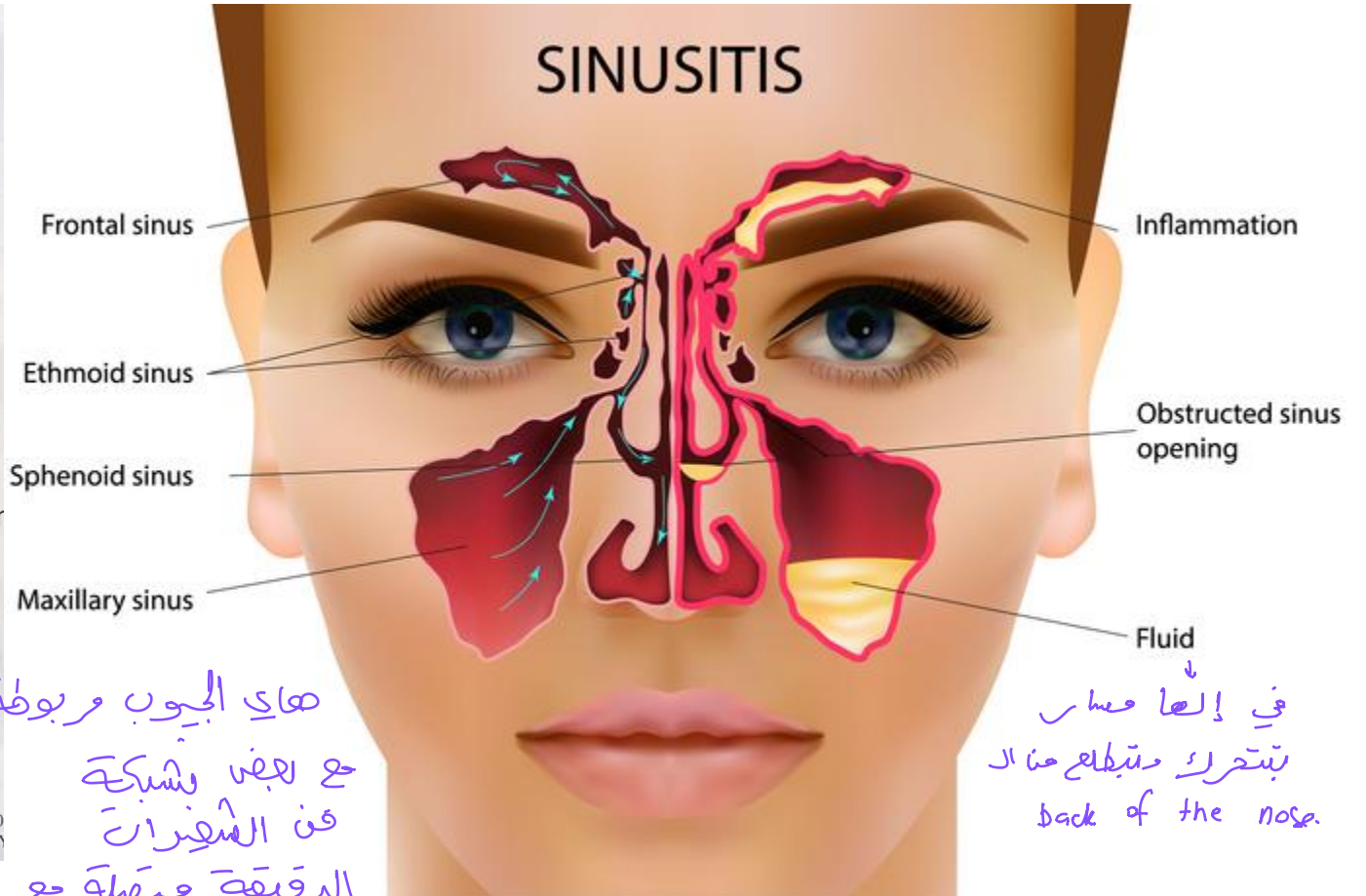
إذا السبب الأساسي لتجمع
 ← good area for bacterial growth → cause infection and inflammation
 ← fluid trapped in the sinus

الخلايا
 هي، لأنه الأنابيب
 سكرت

back of the nose.

هنا الجيوب مبطنة
 مع بعض الشبكة
 من الشعيرات
 الدقيقة متصلة مع بعض
 بحيث أن secretion من هنا الخلايا تجد طريقها وتخرج من
 back of the nose.

©20 MAY



في إلتها مسار
 يتحرك ويتجمع هنا
 back of the nose.

✓ Chronic rhinosinusitis: ^{→ more complicated.}

- may be caused by any of the etiologic agents responsible for acute sinusitis, as well as S. aureus, Corynebacterium diphtheriae, and many anaerobes.

Causes:

- Possible contributing factors include ¹ asthma, ² nasal polyps, ³ allergies, or ⁴ immunodeficiency.
للمخيار
- 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)

↓
قدرة
بعد
infection
توية.

في بعض الحالات تكون الحالة Acute bacterial Rhinosinosis ← ينبغي المريض العلاج بالجرعة واز duration الصحيح والمريض يتحسن في حين فان يكون خارج عن

full eradication of bacteria
في stressful condition وفي ضعف مناعة المريض
لقد اتم راج يرجع ليس عنده نفس ال infection
لأنه البكتيريا في 100٪ حاسة.

Diagnosis:

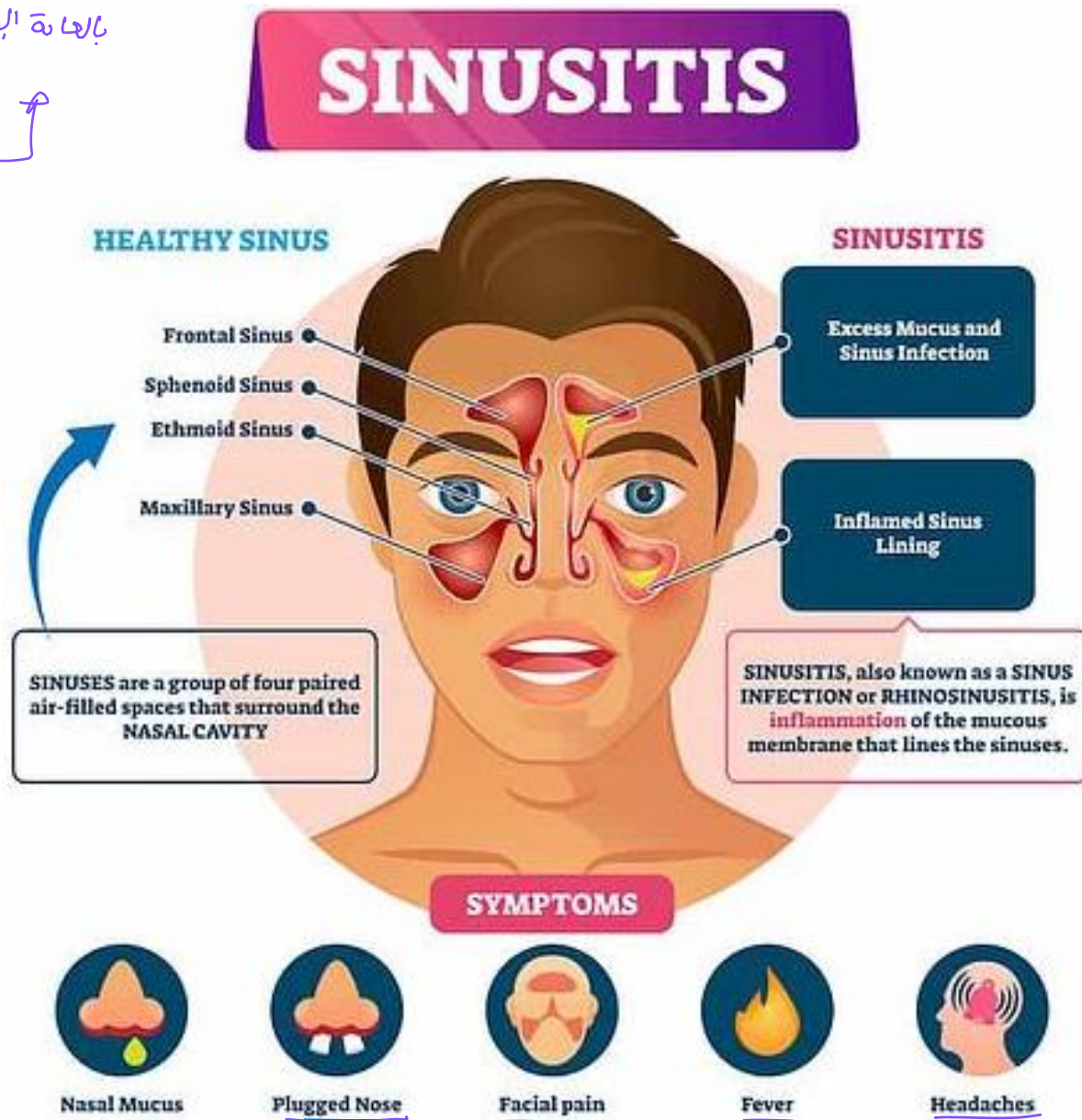
بالإضافة إلى اعتمادنا على الفحوصات
التشخيصية

✓ Clinical Presentation: → signs and symptoms.

- Acute rhinosinusitis presents with
1 purulent nasal discharge, 2 nasal obstruction,
3 facial or dental pain, and 4 sinus tenderness
with or without fever, lasting < 4 weeks.

- Chronic rhinosinusitis is defined by
1 symptoms lasting > 12 weeks including
2 mucopurulent drainage, 3 nasal obstruction,
4 facial pain or pressure, and 5 decreased sense
of smell with documented signs of
inflammation.

nasal cavity. شفت فتحة
nasal mucosa
الغشاء المخاطي للأنف
المنفعل



CLINICAL PRESENTATION

Acute Bacterial Rhinosinusitis

General

- There are three clinical presentations that are most consistent with acute bacterial versus viral rhinosinusitis:
اذا كانت هي الحالة موجودة يكون عند
bacterial Rhinosinusitis.
↓
need Antibiotic

1. Onset with persistent signs or symptoms compatible with acute rhinosinusitis, lasting for ≥10 days without any evidence of clinical improvement.
1. nasal discharge
2. nasal congestion
3. Facial pain or pressure
2. Onset with severe signs or symptoms of high fever ($\geq 39^{\circ}\text{C}$ [102.2°F]) and purulent nasal discharge or facial pain lasting for at least 3 to 4 consecutive days at the beginning of illness.
↓
بداية المرض واستمرت منذ 3 إلى 4 أيام
sever
من بداية المرض واستمرت منذ 3 إلى 4 أيام
حسنة حيث تحسن ورجع نقب

3. 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")
↓
طلب ليحسن المريض وبعد
كم يوم رجعت الأعراض ← انتكاسة المريض

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.

inflammation ← يعني في

chronic rhinosinusitis ← بالعانة رجتا جهم في الـ

Treatment:

→ pharmacological therapy.

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

- 1 • Control infection → more in chronic rhinosinusitis
- 2 • Reduce tissue edema
- 3 • Facilitate drainage ← المحافظة على فائحين لعلاج التنفس
- 4 • Achieve and maintain patency of the sinus ostia
- 5 • Limit antibiotic treatment to those who may benefit.
- 6 • 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):
→ to prevent rebound congestion.

1 ➤ Nasal decongestant spray (use no more than 3 days) → locally.

2 ➤ Oral decongestants may also aid in nasal/sinus patency

3 ➤ Irrigation of nasal cavity with saline & steam inhalation (increase mucosal moisture)
↓
تنبه انه

4 ➤ Mucolytics (eg, guaifenesin) may be used to decrease the viscosity of nasal secretions
↓
systemic side effects
في
زيت
مرفق الـ H2N →

- 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.

في حالة اذا كانت الأخيرة sever و الرئتين ما عم ليحسن يمكن اجر بها + الـ duration ما تكون طويلة.

ليس مش عن الأول اروح أعطي المربي nasal corticosteroid وهو وقت محتاج.

- 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).

Acute bacterial rhinosinusitis

المعقدة

19

For Beta Lactam allergic or primary treatment failure

ceftriaxone

- High-dose amoxicillin-clavulanate is preferred in the following situations: *in bacterial resistance in general:*
 - Regions of high endemic rates ($\geq 10\%$) of invasive penicillin-nonsusceptible *S. pneumoniae*
 - severe infection: systemic toxicity with fever of $\geq 39^\circ\text{C}$
 - attendance at daycare → *الحضانة*
 - 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 *استمرت* persist or worsen after *2 - 3 days* 48 to 72 hours of appropriate antibiotic therapy, then the patient should be reevaluated and alternative antibiotics should be considered.

کلو انترج موف
 مھون زي
 Summary

Acute Sinusitis for Adult and Pediatric Patients Algorithm

Signs and symptoms < 4 weeks

NOTE: Treatment of acute sinusitis should be targeted to cover:

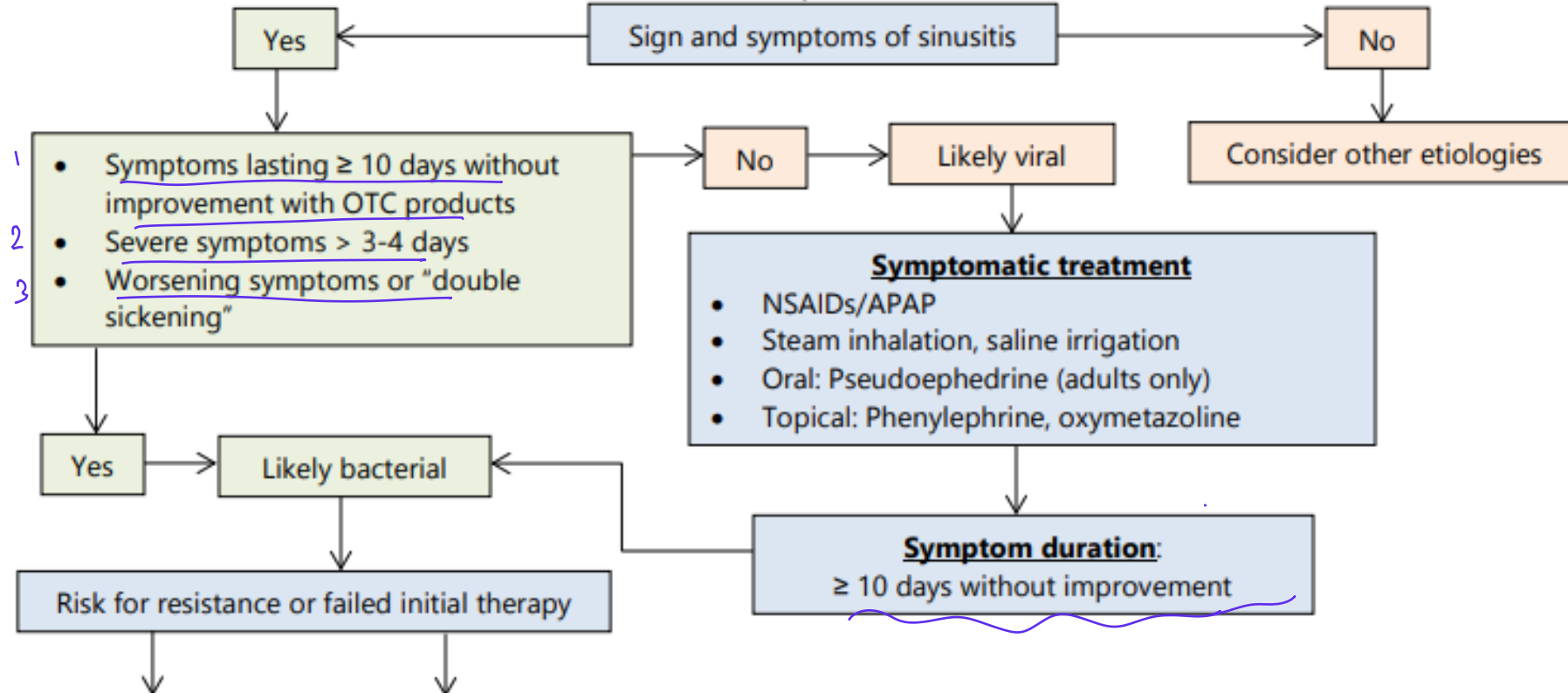
- *S. pneumoniae*
- *M. catarrhalis*
- *H. influenza*

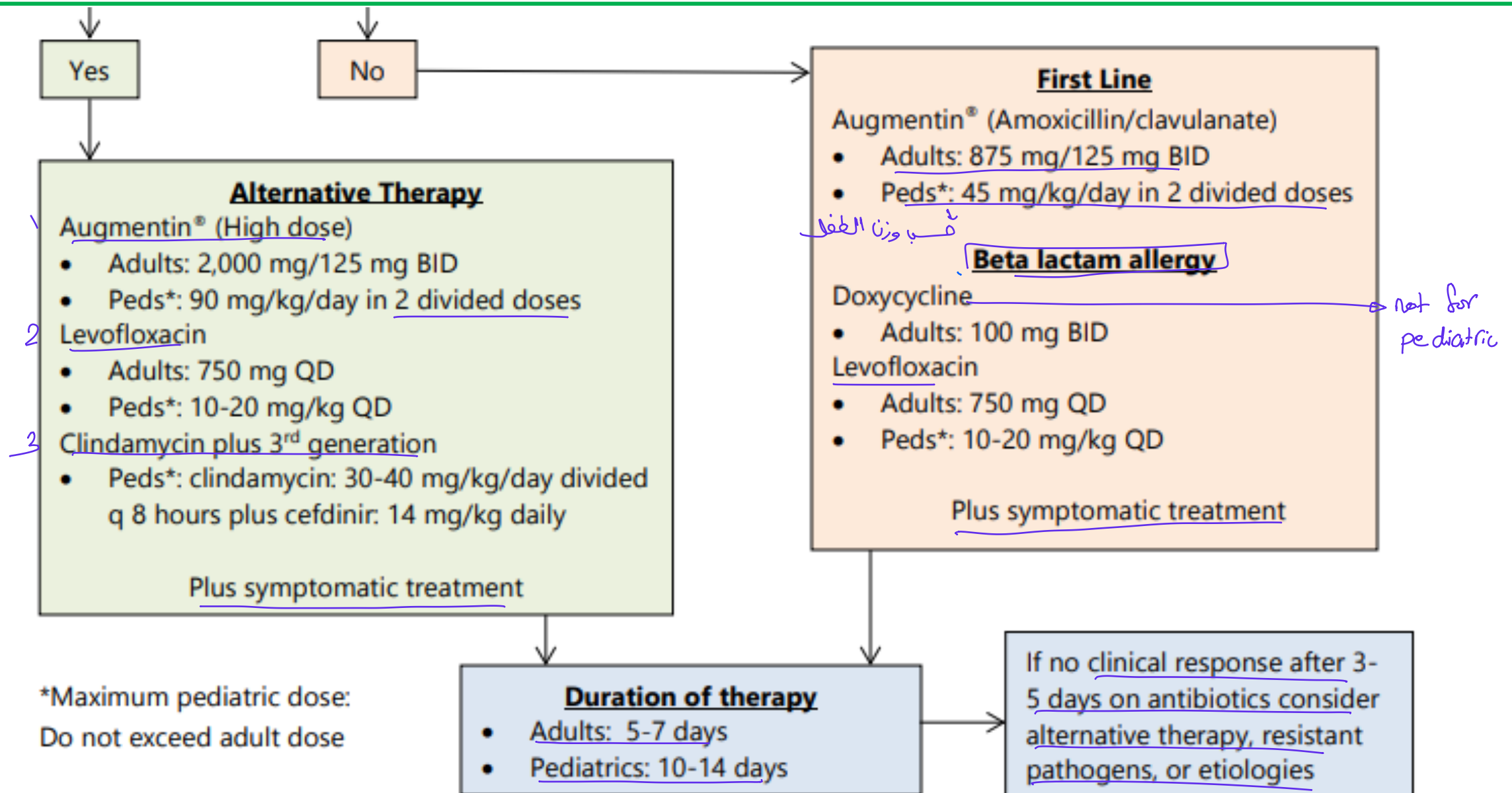
Signs/symptoms lasting < 4 weeks

- Purulent nasal discharge
- Nasal congestion
- Facial pain
- Toothache
- Fever

Risk for Resistance

- Attends daycare
- Age ≤ 2 years or ≥ 65 years
- Recent hospitalization
- Antibiotic use within the past month
- Immunocompromised





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 ^① and/ or systemic glucocorticoids ^②.
- 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 → in adults		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			
1 Ampicillin-sulbactam	Unasyn*	1.5-3 g IV every 6 hours	
2 Levofloxacin	Levaquin*	500 mg orally once daily	
3 Moxifloxacin	Avelox*	400 mg orally once daily	
4 Ceftriaxone	Rocephin*	1-2 g IV every 12-24 hours	
5 Cefotaxime	Claforan*	2 g IV every 4-6 hours	

Data from Reference 15.

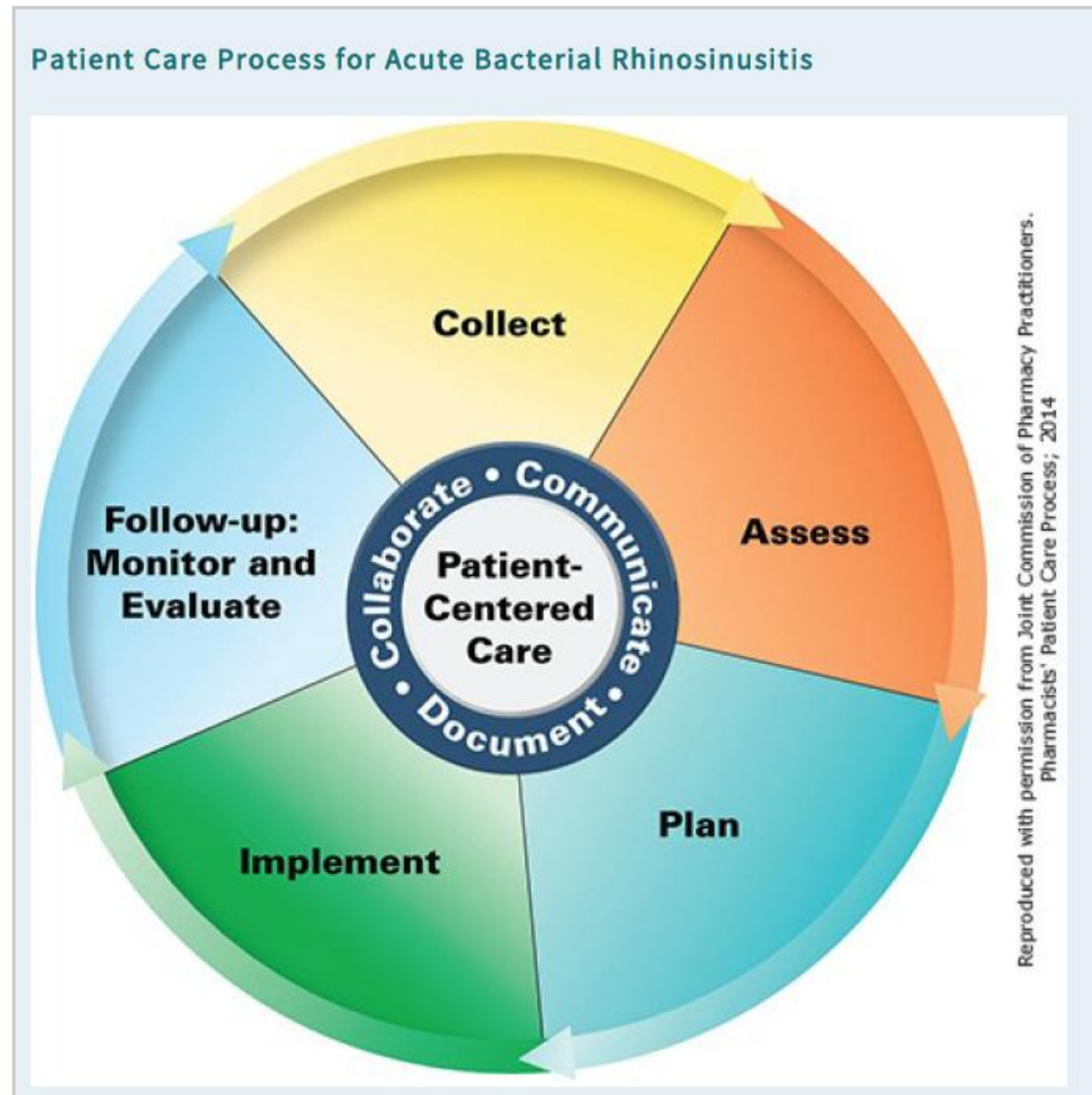
TABLE 126-2 Antibiotics and Doses for Acute Bacterial Rhinosinusitis in Children

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 <i>for mild allergic</i>	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 <i>→ for severe allergic</i>	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.

يعطيكم العافية جميعا ولا تنسوني من صالح دعائكم
زميلتكم مرام الزيايدي 🤝💜

Patient Care Process



Collect

- Patient characteristics (eg, age, weight, comorbidities)
- Patient history (eg, past infections, current and past antibiotic/antiviral use noting previous failures, medication allergies, history of allergic rhinitis)
- Recent healthcare exposures or procedures
- Temporal patterns of symptoms
- Determine whether the patient is in daycare, is a daycare worker, or has a child in daycare
- Objective data:
 - Temperature
 - Signs and symptoms (see “[Clinical Presentation](#)”)
 - Presence of congestion, fullness, or pain in the nose, face, or ear
 - Presence of purulent or discolored nasal discharge
 - Other diagnostic tests, when indicated (eg, computerized tomography scan, sinus puncture)

Assess

- Infection status, including presence and severity of signs and symptoms
- Determine which symptoms may need additional therapy (eg, ongoing nose pain)
- Decide if referral is needed (eg, mental status changes, visual disturbances, immunosuppressive illness, nosocomial infections, anatomic defects, unilateral findings)
- Use information collected, patient factors (eg, patient age, symptom severity), and joint decision-making with parents/caregivers to determine whether antibiotics are needed
- If antibiotics are appropriate, determine proper choice of antibiotic, dose, duration, and dosage form
 - Determine if the patient meets criteria for high-dose amoxicillin-clavulanate

Plan^{*}

- Select drug therapy regimen, including specific antibiotic, dose, route, frequency, and duration; specify the continuation and discontinuation of existing therapies (see [Tables 135-2](#) and [135-3](#))
- Monitor efficacy (eg, temperature, pain), safety (eg, medication-specific adverse effects), and time frame
- Educate patient and/or caregiver (eg, purpose of treatment, drug therapy) emphasizing adherence to treatment regimen

Implement

- Provide patient education regarding the infection and all elements of treatment plan
- Use motivational interviewing and coaching strategies to maximize adherence
- Schedule follow-up, when indicated
- Recommend symptomatic measures to reduce nose pain and inflammation

Follow-up: Monitor and Evaluate

- Improvement/resolution of signs and symptoms; reassess the plan if the patient's symptoms worsen or decline within 48 to 72 hours of symptom onset
- Presence of adverse effects, particularly allergic reactions, and diarrhea
- Patient adherence to treatment plan using multiple sources of information
- Recommend PCV and annual influenza vaccination

**Collaborate with patient, caregiver(s), and other healthcare professionals.*