**Upper Respiratory Tract Infections – Chapter 117**

Most [upper](javascript:PopupGlossaryTerm(2753888);) **respiratory tract infections** have a viral etiology and tend to resolve spontaneously without pharmacologic therapy.

The most common bacterial causes are:

*Streptococcus pneumoniae ….. Empiric Drug of Choice:* ***AMOXICLLIN***

[Acute otitis media](javascript:PopupGlossaryTerm(2753925);)

Acute [sinusitis](javascript:PopupGlossaryTerm(2753785);)

GABHS (group A Beta-hemolytic *Streptococcus) … Empiric Drug of Choice:* ***PENICILLIN***

Acute [pharyngitis](javascript:PopupGlossaryTerm(2753622);)

Vaccination against influenza and pneumococcus may decrease the risk of acute [otitis media](javascript:PopupGlossaryTerm(2753569);)

Because upper **respiratory tract infections** are so common, antibiotics used to treat them serve as catalysts for the emergence and spread of antibiotic resistance, thereby making prudent antibiotic use critically important.

When antibiotics are prescribed, the **empiric** medications of choice are

[Amoxicillin](javascript:windowReference('drugInfo','drugContentPopup.aspx?mid=5631');) for acute otitis media and acute sinusitis

Penicillin for acute pharyngitis

For otitis media, high-dose amoxicillin (80–90 mg/kg/day) is recommended if the patient is at high risk for a penicillin-resistant pneumococcal infection

**INTRODUCTION**

The three most common upper respiratory tract infections:

Otitis media

Sinusitis

Pharyngitis

Less common:

Laryngitis

Rhinitis

Epiglottitis

**ACUTE OTITIS MEDIA**

Otitis media: Inflammation of middle ear

Three subtypes of OM: 1- Acute otitis media ……. Greatest role for antibiotics

2- Otitis media with effusion

3- Chronic otitis media

Risk factor for amoxicillin-resistant bacteria in AOM:

* Child care center
* Recent receipt of antibiotic Tx (within the past 30 d)
* Age < 2 yrs

Pathophysiology:

Bacteria that colonize the nasopharynx enter the middle ear and are not cleared properly by the mucociliary system.[11](http://www.accesspharmacy.com.libproxy.temple.edu/content.aspx?aID=8002091#8002091) The bacteria proliferate and cause infection. Children tend to be more susceptible to otitis media than adults because the anatomy of their eustachian tube is shorter and more horizontal, facilitating bacterial entry into the middle ear

Clinical Presentation:

AOM ……. an acute onset of ear pain

Otitis media with effusion … fluid in the middle ear …. NO signs or symptoms of acute ear infection

Three criteria for AOM:

* Acute onset of signs & symptoms
* Middle ear effusion
* Middle ear inflammation (erythema of the tympanic membrane or ear otalgia – ear pain)

**Treatment**

General approach:

Step 1: Differentiate AOM vs OM with effusion vs chronic OM

Step 2: Address pain with oral analgesics

Step 3: Assess severity level for immediate antibiotic Tx (amoxicillin with high dose is the mainstay to overcome PNC resistance)

Delayed antibiotic Tx until 48-72 hrs to see if the symptoms will resolve on their own

Nonpharmacologic Tx:

Relieve pain: Tylenol, NSAID, anesthetic eardrops

No decongestants or antihistamine necessary (minimal benefits & high adverse effects)

Pharmacologic Tx:

Delayed therapy for:

* Children 6 mos to 2 yr without severe symptoms PLUS uncertain diagnosis
* Children > 2 yr without severe symptoms
* Children > 2 yr with uncertain diagnosis

Antibiotic Tx: Amoxicillin 80-90 mg/kg/d … Strep pneumonia resistant to PCN

Amoxicillin/clavunalate 90 mg/ 6.4 mg/kg/d … with pathogens producing Beta-lactamase

Patients with a penicillin allergy can be treated with several alternative antibiotics

* If the reaction is not type I hypersensitivity, cefdinir, cefpodoxime, or cefuroxime can be used
* If the reaction is type I, a macrolide such as [azithromycin](javascript:windowReference('drugInfo','drugContentPopup.aspx?mid=5692');) or [clarithromycin](javascript:windowReference('drugInfo','drugContentPopup.aspx?mid=5913');) may be used
* If *S. pneumoniae* is documented, clindamycin is an alternative

Traditional recommendations were for 10 to 14 days of antibiotic therapy; however, 5 days of therapy may be as effective as 10 days

In children at least 6 years old who have mild to moderate acute [otitis media](javascript:PopupGlossaryTerm(2753569);), a 5- to 7-day course may be used

Short treatment courses in children younger than 2 years are not recommended

Recurrent AOM:

At least three episodes in 6 months or

At least four episodes in 12 months

Concern: patients younger than 3 years are at high risk for hearing loss and language and learning disabilities

Surgical insertion of tympanostomy tubes (T-tubes) is an effective method for the prevention of recurrent [otitis media](javascript:PopupGlossaryTerm(2753569);)

**ACUTE BACTERIAL SINUSITIS (ABS)**

**Pathophysiology**

ABS is caused most often by the same bacteria implicated in acute otitis media: *S. pneumoniae* and *H. influenzae.*

Similar to [acute otitis media](javascript:PopupGlossaryTerm(2753925);), [acute bacterial sinusitis](javascript:PopupGlossaryTerm(2753924);) usually is preceded by a viral respiratory tract infection that causes mucosal inflammation. This can lead to obstruction of the sinus ostia—the pathways that drain the sinuses. Mucosal secretions become trapped, local defenses are impaired, and bacteria from adjacent surfaces begin to proliferate.

**Clinical presentation**

No simple & accurate diagnostic test available

Gold std test is sinus puncture with recovery of bacteria in high density … invasive … not recommended

Rely on clinical findings to make the diagnosis

Non-specific upper respiratory symptoms for 7-14 days:

Nasal discharge

* Unproductive Cough
* Fever (>39°C [>102°F])
* Facial or sinus swelling and/or pain

**Treatment**:

General approach:

Step 1 - Differentiate between VIRAL and BACTERIAL based on the disease **duration** (not symptoms)

Viral improved in 7-10 days

Bacterial worsening after 5-7 days

Step 2 – Identify whether complicated or uncomplicated

Complicated with ABS …. Based on risk factors

* Immuno status
* Coexisting illnesses
* Beta-lactam resistant strain
* Intense periorbital swelling
* Erythema
* Facial pain

Step 3 - Non-pharmacological Tx

Many symptoms of sinusitis will resolve within 48 hr without medical therapy

If persist … then …. Symptomatic relief, restoring & improving sinus function limited to < 3 d

* Nasal decongestant (phenylephrine, oxymetazoline)
* Oral decongestant
* Mucolytics (guaifenesin)

Anti-histamine should not be used due to their anticholinergic effect that dry mucosa & disturb clearance of mucosal secretion

Step 4 – Pharmacological Tx with ANTIBIOTICS

**ACUTE PHARYNGITIS**

Primary bacterial cause: group A Beta-hemolytic streptococci (GABHS; also known as *S. pyogenes*) – “strep throat”

**Nonsuppurative complications**:

Acute rheumatic fever

Acute [glomerulonephritis](javascript:PopupGlossaryTerm(2753296);)

Reactive arthritis

**Suppurative complications: ……… cause pus**

Peritonsillar abscess

Retropharyngeal abscess

Cervical lymphadenitis

Mastoiditis

[Otitis media](javascript:PopupGlossaryTerm(2753569);)

[Sinusitis](javascript:PopupGlossaryTerm(2753785);)

[Necrotizing fasciitis](javascript:PopupGlossaryTerm(2753511);).

Children < 3 yr are rarely caused by GABHS

Children from 5-15 yr are most susceptible

Incubation period: 2-5 days

Untreated patients with strep pharyngitis are **INFECTIOUS** during the acute illness and for another week thereafter

Effective antibiotic Tx reduce the infectious period to about 24 hrs

**Diagnosis**:

The most common symptom of pharyngitis is SORE THROAT

Differentiate between viral & bacterial ….. Difficult …. Microbiologic testing is recommended if the pt meets the appropriate clinical criteria

Centor criteria for clinical prediction of Beta-hemolytic strep pharyngitis

The Centor criteria will minimize over-testing

**Lab tests:**

Throat swab for:

* Culture …. Gold std but ….. slow … 24-48 hrs
* RADT (rapid antigen detection test) … quick … if negative … follow up with culture to confirm

Lab testing should not be used without consideration of clinical criteria … positive result does not necessary indicate disease … presence of GABHS but not active

**Treatment:**

Once the GABHS pharyngitis is confirmed … then antibiotic Tx initiated

Empiric Tx is not recommended unless there is a high index of suspicion based on clinical or epidemic data & lab results. Antibiotic empiric Tx should be discontinued when negative lab results

Non-pharmacological Tx:

* Antipyretic
* Topical anesthetics (lozenges & spray)
* Analgesics (NSAID may increase risk for necrotizing fasciitis/ toxic shock syndrome)

Pharmacological Tx:

Antibiotic Tx