

upper respiratory tract disease

THE COMMON COLD

- ? It is an acute viral infection of the upper respiratory tract in which the symptoms of rhinorrhea and nasal obstruction are prominent.
- ? The most common infection of children
- ? Systemic symptoms and signs such as headache, myalgia, and fever are absent or mild.
- ? It is more correctly termed rhinosinusitis.

etiology :

- ? Rhinoviruses are associated with more than 50% of colds in adults and children.
- ? Others → respiratory syncytial virus (RSV) human metapneumovirus, parainfluenza viruses and adenoviruses.

epidemiology

- ? In early fall until late spring.
- ? The highest number of infection occurs during the first 2 yr of life.
- ? Children in out- of- home daycare centers during the 1st yr of life have 50% more colds than children cared for only at home.

clinical picture

- ? Fever
- ? Nasal discharge
- ? Sore or scratchy throat
- ? Cough
- ? Headache,
- ? Hoarseness,
- ? Irritability, difficulty sleeping,
- ? Decreased appetite.
- ? Eardrums are usually congested
- ? In older children → dryness and irritation of the nose, sneezing, chilly sensation, myalgia, headache, malaise and anorexia
- ? Vomiting and diarrhea are uncommon.
- ? The physical findings are limited to the upper respiratory tract

LAB:

- ? Clinical diagnosis
- ? R/ O underlying diseases
- ? Routine laboratory studies are not helpful.
- ? Nasal smear

- ❓ X- Ray
- ❓ Virus or bacteria detection

Treatment :

- ❓ Supportive Care and Symptomatic Treatment
 - Hydration
 - Ingestion warm fluids
 - Topical nasal saline
- ❓ Oral nonprescription therapies (often containing antihistamines, antitussives, and decongestants) → not be used for infants and children younger than 6 yr of age
- ❓ Zinc → reduces the duration but not the severity of symptoms of a common cold if begun within 24 hr of symptoms.
- ❓ Antipyretics and analgesics (not Aspirin)
- ❓ Nasal decongestants → Either topical or oral adrenergic agents (oxymetazoline, or phenylephrine) not recommended for use in children younger than 6 yr old → rhinitis medicamentosa

complication :

- ❓ Acute otitis media (The most common complication)
- ❓ Sinusitis
- ❓ Laryngotracheobronchitis
- ❓ Bronchiolitis
- ❓ Pneumonia
- ❓ Asthma exacerbation

ACUTE PHARYNGITIS

refers to inflammation of the pharynx, including erythema, edema, exudates, or an enanthem (ulcers, vesicles).

Causes

- 1- environmental exposures (tobacco smoke, air pollutants, and allergens)
- 2- contact with caustic substances (hot food, and liquids)
- 3- infectious agents → most common viral.
- 4- systemic disease (SLE, kawasaki....)

Table 381-1**Infectious Agents That Cause Pharyngitis**

VIRUSES	BACTERIA
Adenovirus	<i>Streptococcus pyogenes</i>
Coronavirus	(Group A streptococcus)
Cytomegalovirus	<i>Arcanobacterium haemolyticum</i>
Epstein-Barr virus	<i>Fusobacterium necrophorum</i>
Enteroviruses	<i>Corynebacterium diphtheriae</i>
Herpes simplex virus	<i>Neisseria gonorrhoeae</i>
Human immunodeficiency virus	Group C streptococci
Human metapneumovirus	Group G streptococci
Influenza viruses	<i>Francisella tularensis</i>
Measles virus	<i>Chlamydophila pneumoniae</i>
Parainfluenza viruses	<i>Chlamydia trachomatis</i>
Respiratory syncytial virus	<i>Mycoplasma pneumoniae</i>
Rhinoviruses	

2 viral pharyngitis

- Gradual onset
- Fever, malaise, anorexia, moderate throat pain, sore throat, hoarseness, cough
- Small ulcers and exudates
- Cervical lymphnodes enlargement
- WBC 6000- 30,000 , predominantly PMN cells in the early phase of illness
- The entire illness may last in 24hr- 5days
- Significant complications are rare

2 Gingivostomatitis and ulcerating vesicles throughout the anterior pharynx and on the lips are seen in primary oral herpes simplex virus infection.**2 Discrete papulovesicular lesions or ulcerations in the posterior oropharynx, severe throat pain, and fever are characteristic of herpangina, caused by various enteroviruses.****2 In hand- foot- mouth disease there are vesicles or ulcers throughout the oropharynx, vesicles on the palms and soles, and sometimes on the trunk and extremities; Coxsackie A16 is the most common agent.****Group A Streptococcal Pharyngitis**

GAS is the most important bacterial cause of acute pharyngitis.

Age → 5 – 15 yr (uncommon before 2- 3 yr of age)

Winter and spring

Asymptomatic carriage or acute infection

clinical picture :

- ? Sore throat
- ? Fever
- ? Headache
- ? Myalgia
- ? Arthralgia
- ? Anorexia
- ? Abdominal pain
- ? Vomiting
- ? Ear pain

Diarrhea, cough, coryza, ulcerations, croup/ laryngitis/ hoarseness, and conjunctivitis are not associated with GAS pharyngitis and increase the likelihood of a viral etiology.

physical examination :

- ? Pharynx is red
- ? The tonsils are enlarged, covered with a white, grayish, or yellow exudate that may be blood-tinged
- ? Petechiae or “doughnut” lesions on the soft palate and posterior pharynx and the uvula
“White strawberry tongue.” → “red strawberry tongue.”
- ? (“Sandpaper”) rash of scarlet fever

Diagnosis:

- ? Streptococcal and viral (EBV) pharyngitis can be difficult to be distinguished.
- ? Throat culture remains the “gold standard” for diagnosing streptococcal pharyngitis
- ? Rapid antigen- detection tests (RADTs)
- ? PCR
- ? Viral cultures
- ? Antistreptococcal antibodies, including antistreptolysin- O antibodies (ASOT) and antideoxyribonuclease (anti- DNase) B antibodies are useful for documenting prior infection in persons diagnosed with acute rheumatic fever, glomerulonephritis, or other complications of GABHS pharyngitis.

treatment:

- ? Viral → supportive
- ? Bacterial

- The primary benefit of antibiotic treatment is the **prevention of acute rheumatic fever**
- Antibiotic **therapy does not prevent acute poststreptococcal glomerulonephritis**
- Administering oral penicillin for 10 days is the best treatment of acute GABHS pharyngitis
- **Intramuscular penicillin (ie, benzathine penicillin G) is required for persons who may not be compliant with a 10- day course of oral therapy.**

? Antibiotic treatment can be started when there is:

- 1- **Children with symptomatic pharyngitis and positive GAS RADT or throat culture.**
- 2- Clinical diagnosis of **scarlet fever**
- 3- Symptomatic child has a household contact with documented streptococcal pharyngitis
- 4- History of ARF in the **patient or a family member**

But a diagnostic test should be performed to confirm the presence of GAS.

Indications for treatment of **STREPTOCOCCUS CARRIERS**

- **"carrier state" is defined by a positive pharyngeal culture of group A beta hemolytic Streptococcus pyogenes (GABHS), without evidence of an antistreptococcal immunologic response.**
- **Community outbreak of ARF or APSGN**
- **Personal or family history of ARF**
- **outbreak of GAS pharyngitis in a closed or semiclosed community (nursing home or healthcare facility)**
- **Repeated episodes of symptomatic GAS pharyngitis in a family with "ping pong" spread among family members despite adequate therapy**
- ? Clindamycin given by mouth for 10 days is effective therapy .
- ? Amoxicillin- clavulanate for 10 days)
- ? A 4 days of oral rifampin plus either intramuscular benzathine penicillin given once or oral penicillin given for 10 days.

Recurrent Pharyngitis

Tonsillectomy may lower the incidence of pharyngitis for 1- 2 yr.

complication :

- ? **Acute otitis media**
- ? **Sinsitis**
- ? **Pneumonia**
- ? **Parapharyngeal abscess (quinsy)**
- ? **Acute rheumatic fever**
- ? **Acute poststreptococcal glomerulonephritis**
- ? **Poststreptococcal reactive arthritis**
- ? **Lemierre syndrome (thrombophlebitis of the internal jugular vein)**

tonsillitis and adenoid

- ? Most episodes of acute pharyngotonsillitis are caused by viruses.
- ? Group A β - hemolytic streptococcus (GABHS) is the most common cause of bacterial infection in the pharynx.
- ? The tonsils and adenoids can be chronically infected by multiple microbes, which can include a high incidence of β - lactamase— producing organisms.
- ? Both aerobic species, such as streptococci and Haemophilus influenzae, and anaerobic species, such as Peptostreptococcus, Prevotella, and Fusobacterium, contribute.

clinical picture:

- ? Symptoms → odynophagia, dry throat, malaise, fever and chills, dysphagia, referred otalgia, headache, muscular aches, and enlarged cervical nodes.
- ? Signs → dry tongue, erythematous enlarged tonsils, tonsillar or pharyngeal exudate, palatine petechiae, and enlargement and tenderness of the jugulodigastric lymph nodes
- ? Large tonsils are typically seen on examination.
- ? The size of the adenoid tissue can be demonstrated on a lateral neck radiograph or with flexible endoscopy.
- ? Children with chronic or cryptic tonsillitis present with halitosis, chronic sore throats, foreign- body sensation, or a history of expelling foul- tasting and foul- smelling cheesy lumps.
- ? Daytime symptoms of airway obstruction, secondary to adenotonsillar hypertrophy, include chronic mouth breathing, nasal obstruction, hyponasal speech, hyposmia, decreased appetite, poor school performance, and, rarely, symptoms of right- sided heart failure.
- ? Nighttime symptoms consist of loud snoring, choking, gasping, frank apnea, restless sleep, abnormal sleep positions, somnambulism, night terrors, diaphoresis, enuresis, and sleep talking.

Clinical manifestations in adenoid hypertrophy:

- ? Mouth breathing
- ? Persistent rhinitis
- ? Snoring and cough
- ? Nasal speech
- ? Offensive breath
- ? Impaired taste and smell
- ? Chronic OM and hearing impairment
- ? Obstructive sleep apnea
- ? Pulmonary artery HTN

treatment:

Medical Management

- ? Same as in Pharyngitis.
- ? Because copathogens such as staphylococci or anaerobes can produce β - lactamase that can inactivate penicillin, the use of cephalosporins or clindamycin may be more efficacious in the



Indications for tonsillectomy:

1. The only absolute indication is to rule out tumor and severe aerodigestive tract obstruction.
2. Seven or more throat infections in the past year or five or more throat infections in each of the past 2 year or three or more throat infections in each of the past 3 year.
3. Tonsillectomy may be considered in children who do not meet the above criteria but have multiple antibiotic allergies/ intolerances, PFAPA (periodic fever, aphthous stomatitis, pharyngitis, and adenitis), or a history of peritonsillar abscess.

Indications for Adenoidectomy

1. Chronic nasal infection (chronic adenoiditis) and chronic sinus infections
2. Recurrent bouts of acute otitis media
3. Chronic or recurrent otitis media with effusion
4. Nasal obstruction, chronic mouth breathing, and loud snoring suggesting sleep- disordered breathing
5. Craniofacial or occlusive developmental abnormalities→adenoid face

CHOANAL ATRESIA

- ? This is the most common congenital anomaly of the nose
- ? It is a condition that describes narrowing or obliteration of the posterior nasal aperture
- ? Unilateral > bilateral
- ? Mostly bony (90%) or mixed, rarely purely membranous

clinical picture

- ? Asymptomatic if unilateral for a prolonged period, often until the first respiratory infection, when unilateral nasal discharge or persistent nasal obstruction can suggest the diagnosis.
- ? Symptomatic if bilateral→ respiratory distress and cyanosis during sucking and feeding.
- ? Distressed children then cry (which relieves the cyanosis) and become calmer.

diagnosis:

- ? Diagnosis is established by the inability to pass a firm catheter through each nostril 3- 4 cm into the nasopharynx.
- ? The atretic plate may be seen directly with fiberoptic rhinoscopy.
- ? High resolution CT scan is the definitive radiological study of choice.

treatment :

- ? Airway management → oral airway or intubation
- ? Feeding by gavage.
- ? In bilateral cases, intubation or, less often, tracheotomy may be indicated.
- ? Surgery → transnasal repair.
- ? Operative correction of unilateral obstruction may be deferred for several years.

foreign body :

- ? Foreign bodies (food, beads, small toys...etc) are often placed in the nose by small children and developmentally delayed.

clinical manifestation :

- ? First symptoms include unilateral obstruction, sneezing, relatively mild discomfort, and, rarely, pain.
- ? Presenting clinical symptoms include history of insertion of foreign bodies (86%), mucopurulent nasal discharge (24%), foul nasal odor (9%), epistaxis (6%), nasal obstruction (3%), and mouth breathing (2%).
- ? The patient might also present with a generalized body odor known as bromhidrosis

diagnosis :

- ? Unilateral nasal discharge (purulent, malodorous, or bloody) and obstruction
- ? Can often be seen on examination with a nasal speculum or wide otoscope placed in the nose.
- ? A long- standing foreign body can become embedded in granulation tissue or mucosa and appear as a nasal mass.

treatment:

- ? Prompt removal minimizes the danger of aspiration and local tissue necrosis. By using either forceps or nasal suction or Katz catheter
- ? If there is marked swelling, bleeding, or tissue overgrowth, general anesthesia may be needed to remove the object.
- ? Magnets can be used to extract metal foreign bodies.

complication :

- ? Posterior dislodgement and aspiration,
- ? Trauma and local tissue damage (Septal perforation) caused by the object itself or removal attempts
- ? Infection
- ? Choanal stenosis.

The structural integrity of healthy laryngeal cartilage (i.e., cricoid cartilage) maintains an open airway during breathing. Other laryngeal functions are airway protection during swallowing and phonation.

LARYNGOMALACIA

- ? Laryngomalacia is the most common congenital laryngeal anomaly.
- ? The most common cause of stridor in infants and children.
- ? About 70% of cases are associated with GERD
- ? The stridor is caused by decreased laryngeal tone leading to supraglottic collapse during inspiration.
- ? Symptoms usually appear within the 1st 2 wk of life and increase in severity for up to 6 mo, although gradual improvement can begin at any time.
- ? Most cases spontaneously resolve by 2 yr of age

Pathophysiology

- Congenital abnormality of laryngeal cartilage → ↑ laxity and collapse of supraglottic structures during inspiration → airway obstruction

diagnosis :

- ? The diagnosis is made primarily based on symptoms.
- ? Stridor is worse when supine and neck flexion, and better when prone and neck extended.
- ? feeding difficulties and dysphagia in some children because of decreased laryngeal sensation and poor suck swallow breath coordination.
- ? Because 15- 60% of infants with laryngomalacia have synchronous airway anomalies, complete bronchoscopy is undertaken for patients with moderate to severe obstruction.
- ? The diagnosis is confirmed by outpatient flexible laryngoscopy → omega shape epiglottis

treatment

- ? Expectant observation is suitable for most infants because most symptoms resolve spontaneously as the child and airway grow.
- ? In 15- 20% of patients symptoms are severe enough to cause progressive respiratory distress, cyanosis, or failure to thrive so surgical intervention via supraglottoplasty is considered.

BACTERIAL TRACHEITIS

- ? Bacterial tracheitis is an acute bacterial infection of the upper airway that is life threatening and often follows a viral respiratory infection (especially laryngotracheitis) rather than a primary bacterial illness.
- ? Age is between 5 and 7 yr

etiology :

- ? S. aureus (the most common)
- ? S. pneumoniae
- ? S. pyogenes
- ? Moraxella catarrhalis
- ? Nontypeable H. influenzae
- ? Anaerobic organisms

clinical picture

- ? Brassy cough
- ? High fever
- ? Toxicity
- ? Respiratory distress
- ? Mucosal swelling (at the level of the cricoid cartilage)
- ? Copious, thick, purulent secretions
- ? Patients can lie flat, does not drool, and does not have the dysphagia (DD with epiglottitis)

diagnosis

- ? Clinical findings
- ? X- Ray → neither definitive nor essential.

- ? Definitive diagnosis of bacterial tracheitis requires direct visualization of an inflamed, exudate-covered trachea.

treatment

- ? Supplemental oxygen
- ? An artificial airway should be strongly considered
- ? The usual treatment for croup (racemic epinephrine) is ineffective.
- ? Antibiotics→ vancomycin or clindamycin and a third generation cephalosporin (e.g., cefotaxime or ceftriaxone)



Epiglottitis vs. Croup vs. Bacterial tracheitis

	Epiglottitis	Croup	Bacterial Tracheitis
Anatomy	Supraglottic	Subglottic	Tracheal lumen
Etiology	Bacterial	Viral	Bacterial
Age Range	3-7 years, adults	6months-3 years	3weeks-16 yrs
Onset	6-24 hours	2-3 days	1-3 days
Toxicity	Marked	Mild to moderate	Mild- marked
Drooling	Frequent	Absent	Absent
Cough	Unusual	Frequent	Frequent
Hoarseness	Unusual	Frequent	Frequent
WBC	Leukocytosis	Normal	Leukocytosis

Acute Inflammatory Upper Airway Obstruction

- ? Inflammation involving the vocal cords and structures inferior to the cords is called laryngitis, laryngotracheitis, or laryngotracheobronchitis,
- ? Inflammation of the structures superior to the cords (i.e., arytenoids, aryepiglottic folds [“false cords”], epiglottis) is called supraglottitis

Example

Croup
Epiglottitis
Laryngitis
Bacterial Tracheitis

- ? Stridor is an audible harsh, high-pitched musical respiratory sound, which is usually inspiratory but can be biphasic and is produced by turbulent airflow through a partially obstructed upper airway; it is not a diagnosis but a sign of upper airway obstruction.
- ? Inspiratory stridor suggests a laryngeal obstruction, whereas expiratory stridor suggests tracheobronchial obstruction. Biphasic stridor indicates either a subglottic or glottic anomaly.

croup (Laryngotracheobronchitis):

- ? The most common form of acute upper respiratory obstruction
- ? Inflammation and edema of the subglottic larynx and trachea, especially near the cricoid cartilage, are most clinically significant.
- ? swelling can significantly reduce the diameter, limiting airflow. This narrowing results in the seal-like barking cough, turbulent airflow, stridor, and chest wall retractions.
- ? Age → 3 mo to 5 yr (peak in the 2nd yr of life)
- ? Most commonly in the late fall and winter

etiology :

- ? The most common cause is viral
- ? The parainfluenza viruses (types 1, 2, and 3) account for approximately 75% of cases.
- ? Other viruses → influenza A and B, adenovirus, respiratory syncytial virus, enterovirus, coronavirus and rhinovirus.
- ? The bacterial pathogen, *Mycoplasma pneumoniae*, has also been identified in a few cases of croup.

Spasmodic croup (laryngismus stridulus)

- ? is noninfectious variant of the disorder, with a clinical presentation similar to that of the acute laryngotracheobronchitis but typically without fever and with less coryza.
- ? This type of croup always occurs at night and has the hallmark of reoccurrence in children; hence it has also been called "recurrent croup."
- ? In spasmodic croup, subglottic edema occurs without the inflammation typical in acute viral disease.
- ? Although viral illnesses may trigger this variant, the reaction may be of allergic etiology rather than a direct result of an infectious process.
- ? Occurs most often in children 1- 3 yr of age

clinical picture:

- ? H/o URTI for 1- 3 days

Acute coryza
Common cold

- ? The child then develops the characteristic “barking” cough, hoarseness, and inspiratory stridor
Mild fever
- ? Symptoms worse at night and often recur with decreasing intensity for several days and resolve completely within a week
- ? The child may prefer to sit up in bed or be held upright.
- ? Agitation and crying greatly aggravate the symptoms and signs.

physical examination :

- ? Hoarse voice, coryza, inflamed pharynx, respiratory distress, stridor
- ? Croup is a disease of the upper airway, and alveolar gas exchange is usually normal >> Hypoxia and low oxygen saturation are seen only when complete airway obstruction is imminent.
- ? The child who is hypoxic, cyanotic, pale, or obtunded needs immediate airway management

diagnosis :

- ? Clinical diagnosis
- ? +/- PA neck X- Ray (subglottic narrowing, or steeple sign) (also known as a pencil- point sign)
- ? The lateral neck view may reveal a distended hypopharynx (ballooning) during inspiration.
- ? A steeple sign may also be observed in patients without croup, which warrants other differential considerations for this radiographic finding, such as epiglottitis, thermal injury, angioedema, or bacterial tracheitis.

treatment :

- ? Most children with mild croup symptoms treated at home by their caregivers.
- ? Cool mist from a humidifier and/ or sitting with the child in a bathroom (not in the shower) filled with steam generated by running hot water from the shower, help minimize symptoms.
- ? Young children should be kept as comfortable as possible, allowing him or her to remain in a parent's arms and avoiding unnecessary painful interventions that may cause agitation, respiratory distress, and lead to increased oxygen requirements.
- ? The mainstay of treatment for children with croup is airway management and treatment of hypoxia.
- ? Nebulized racemic epinephrine is an accepted treatment for moderate or severe croup.

The indications for the administration of nebulized epinephrine include:

1. moderate to severe stridor at rest
 2. the possible need for intubation
 3. respiratory distress
 4. hypoxia.
- ? Its effectiveness is within 30 minutes and then, a lasting effect from 90- 120 minutes (1.5- 2 h).
 - ? Can be repeated every 20 minutes
 - ? Patients can be safely discharged home after a 2- 3 hr period of observation provided they have no stridor at rest; have normal air entry, normal pulse oximetry, and normal level of consciousness; and have received steroids.
 - ? Steroids→

- The effectiveness of oral corticosteroids in viral croup is well established.
- oral dosing of dexamethasone is as effective as intramuscular administration
- A single dose of oral prednisolone is less effective
- ? Heliox → Heliox is a gas that contains a mixture of helium and oxygen.
 - Helium facilitates the movement of oxygen through the airways and decreases the mechanical work of respiratory muscles.
- ? Antibiotics are not indicated
- ? Nonprescription cough and cold medications should not be used in children younger than 4 yr of age

indication for hospitalization

- ? Progressive stridor
- ? Severe stridor at rest
- ? Respiratory distress
- ? Hypoxia
- ? Cyanosis
- ? Depressed mental status
- ? Poor oral intake
- ? The need for reliable observation.

ACUTE EPIGLOTTITIS (Supraglottitis)

it is a rare, but still dramatic and potentially a lethal condition

Etiology

- ? Haemophilus influenzae type b
- ? Streptococcus pyogenes
- ? Streptococcus pneumoniae
- ? Nontypeable H. influenzae
- ? Staphylococcus aureus

the typical patient with epiglottitis caused by H. influenzae type b was 2- 4 yr of age.

Currently, the most common presentation of epiglottitis is an adult with a sore throat, although cases still do occur in underimmunized children; vaccine failures have been reported.

clinical picture

- ? An acute rapidly progressive fever
- ? Sore throat
- ? Dyspnea and rapidly progressing respiratory obstruction
- ? Patient appears toxic
- ? Difficult swallowing
- ? Drooling
- ? Neck is hyperextended in an attempt to maintain the airway

- ? The child may assume the tripod position (sitting upright and leaning forward with the chin up and mouth open while bracing on the arms)
- ? Cyanosis and then coma
- ? Stridor is a late finding and suggests near- complete airway obstruction.
- ? The barking cough typical of croup is rare

diagnosis

- ? The diagnosis requires visualization under controlled circumstances of a large, cherry red, swollen epiglottitis by laryngoscopy
- ? Anxiety- provoking interventions such as phlebotomy, intravenous line placement, placing the child supine, or direct inspection of the oral cavity should be avoided until the airway is secure.
- ? Classic lateral radiographs of the neck show the thumb sign

treatment

- ? Epiglottitis is a medical emergency and warrants immediate treatment with an artificial airway
- ? Establishing an airway by endotracheal or nasotracheal intubation or by tracheostomy is indicated in patients with epiglottitis, regardless of the degree of apparent respiratory distress
- ? Oxygen (unless the mask causes excessive agitation)
- ? Racemic epinephrine and corticosteroids are ineffective.
- ? Cultures of blood, epiglottic surface, and, in selected cases, cerebrospinal fluid should be collected after the airway is stabilized.
- ? ABX→ Cefotaxime, ceftriaxone, or meropenem.
- ? Epiglottitis resolves after a few days of antibiotics because the response to antibiotics is usually rapid, and the patient may be extubated; antibiotics should be continued for at least 10 days.
- ? Indications for rifampin prophylaxis for all household members include
 - child within the home who is younger than 4 yr of age and incompletely immunized
 - Younger than 12 mo of age and has not completed the primary vaccination series
 - Immunocompromised.

Acute Otitis Media

- ? AOM is a viral or bacterial infection of the middle ear.
- ? By age three, more than 80 percent of children have been diagnosed as AOM.
- ? Otitis media with effusion is middle ear effusion in the absence of acute infection.
- ? Chronic suppurative otitis media is persistent infection and resultant perforation of the tympanic membrane.

<i>Factor</i>	<i>Comments</i>
Age	Maximal incidence between six and 24 months of age; eustachian tube shorter and less angled at this age. Underdeveloped physiologic and immunologic responses to infection in children
Breastfeeding	Breastfeeding for at least three months is protective; this effect may be associated with position maintained during breastfeeding, suckling movements, and protective factors in breast milk
Daycare attendance*	Contact with multiple children and daycare providers facilitates spread of bacterial and viral pathogens
Ethnicity*	Native American, Alaskan, and Canadian Inuit children have increased incidence
Exposure to cigarette smoke	Increased incidence with cigarette smoke and air pollution, especially if parents smoke
Male sex	Slightly increased incidence
More than one sibling living at home*	Increased risk of antibiotic treatment failure
Pacifier use	Increased incidence
Previous antibiotic use*	Increased risk of antibiotic treatment failure
Previous otitis media*	Increased risk of antibiotic treatment failure
Season*	Increased incidence in fall and winter
Underlying pathology*	Increased incidence in children with allergic rhinitis, cleft palate, Down syndrome

Diagnostic criteria for AOM

- ❑ Rapid onset of symptoms AND
- ❑ Middle ear effusion (bulging TM, limited or absent mobility of membrane and air-fluid level behind membrane) AND Signs and symptoms of middle ear inflammation (erythema of TM and otalgia affecting sleep or normal activity).

CLINICAL picture:

Non- specific symptoms of AOM:

- ❑ Fever
- ❑ Headache,
- ❑ Irritability
- ❑ Cough
- ❑ Rhinitis
- ❑ Listlessness
- ❑ Anorexia
- ❑ Vomiting
- ❑ Diarrhea

treatment

- ❑ Pain management is important in the first two days after diagnosis.

- ? Acetaminophen (15 mg/ kg every four to six hrs) and ibuprofen (10 mg/ kg every six hrs)
- ? Antibiotics are recommended for all children younger than six months, for those six months to two years of age
- ? All children older than two years with severe infection (defined as moderate to severe otalgia or temperature greater than 39° C.
- ? High- dosage amoxicillin (80 to 90 mg/ kg/ day BD for 10 days) is recommended as first- line antibiotic therapy in children with AOM.
- ? In children older than six years with mild to moderate disease, a five- to seven day course is adequate.
- ? Cephalosporins may be used in children allergic to penicillin if there is no history of urticaria or anaphylaxis to penicillin.
- ? If there is a history of urticaria or anaphylaxis to penicillin., a macrolide (e.g., azithromycin, clarithromycin) or clindamycin may be used.
- ? A single dose of parenteral ceftriaxone (50 mg per kg) may be useful in children with vomiting or in whom compliance is a concern.
- ? If there is no clinical improvement within 48 to 72 hours, initiate antibiotic therapy in those on symptomatic treatment alone.
- ? Patients who are already taking antibiotics should be changed to second- line therapy.
- ? Second- line therapy include high- dose amoxicillin/ clavulanate, cephalosporins, and macrolides.
- ? Parenteral ceftriaxone administered daily over three days is useful in children with emesis or resistance to amoxicillin/ clavulanate.
- ? For children who do not respond to second- line antibiotics, clindamycin and tympanocentesis are appropriate options.
- ? CT is useful if bony extension is suspected. MRI is superior to CT in evaluating potential intracranial complications.

Prevention

- ? Continue exclusive breastfeeding as long as possible
- ? Smoke- free environment
- ? Pneumococcal vaccine & influenza vaccine

IF high- risk for recurrent acute otitis media Prolonged courses of antimicrobial prophylaxis as Amoxicillin (20 to 30 mg/ kg/ day) or sulfisoxazole (50 mg/ kg/ day) given once daily at bedtime for 3 to 6 months or longer

Sinusitis

- ? Suppurative infection of the sinuses

Predisposition

- ? Common cold, Allergic rhinitis: Approximately 0.5- 2% of viral upper respiratory tract infections in children and adolescents are complicated by acute symptomatic bacterial sinusitis.
- ? Nasotracheal / nasogastric intubations

- ? Cyanotic heart disease
- ? C.F, Ig disorders, immotile cilia syndrome
- ? HIV, immune compromised patients

Sinus Formation

- ? At birth: Maxillary, Ethmoid are present.
- ? only the ethmoidal sinuses are pneumatized maxillary sinuses are not pneumatized until 4 yr of age
- ? The sphenoidal sinuses are present by 5 yr of age, the frontal sinuses begin development at age 7-8 yr and are not completely developed until adolescence

Classification

- ? Acute sinusitis is defined by duration of <30 days
- ? Subacute by duration of 1- 3 mo
- ? Chronic by duration of longer than 3 mo.

etiology

- ? The bacterial pathogens causing acute bacterial sinusitis in children include Streptococcus pneumoniae (~30%), Haemophilus influenzae (~20%), and Moraxella catarrhalis (~20%).

clinical picture

- ? Mucopurulent rhinorrhea.
- ? Night cough.
- ? Nasal speech.
- ? Facial swelling (pain, headache, tenderness).

diagnosis:

clinical diagnosis of acute bacterial sinusitis is based on history. Persistent symptoms of upper respiratory tract infection, including

- ? nasal discharge and cough, for longer than 10 days without improvement,
- ? or severe respiratory symptoms, including temperature of at least 39°C (102°F) and purulent nasal discharge for 3- 4 consecutive days, suggest a complicating acute bacterial sinusitis.
- ? X- Ray/ CT shows clouding/ air fluid level.
- ? Sinus aspirate culture is the only accurate method of diagnosis but is not practical for routine use for immunocompetent patients.
- ? Sinus aspirate may be a necessary procedure for immunosuppressed patients with suspected fungal sinusitis.

Findings on radiographic studies (sinus plain films, CT scans)

- ? Opacification
- ? mucosal thickening
- ? presence of an air- fluid level

Such findings can confirm the presence of sinus inflammation but cannot be used to differentiate among viral, bacterial, or allergic causes of inflammation.

Therapy

- ? first line : Amox- clavulenic acid
- ? 2nd line : Cephalosporin: cefdinir, cefuroxime axetil, cefpodoxime, or cefixime.
- ? In older children, levofloxacin is an alternative antibiotic.
- ? Azithromycin and trimethoprim- sulfamethoxazole are no longer indicated because of a high prevalence of antibiotic resistance.
- ? In severe sinusitis, treatment with high- dose amoxicillin- clavulanate (80- 90 mg/ kg/ day of amoxicillin) should be initiated. Ceftriaxone (50 mg/ kg, IV or IM).

Complications:

- ? orbital cellulitis (most often secondary to acute bacterial ethmoiditis)
- ? epidural/ subdural empyema
- ? brain abscess
- ? dural sinus thrombosis
- ? Meningitis
- ? osteomyelitis of the frontal bone (Pott puffy tumor)