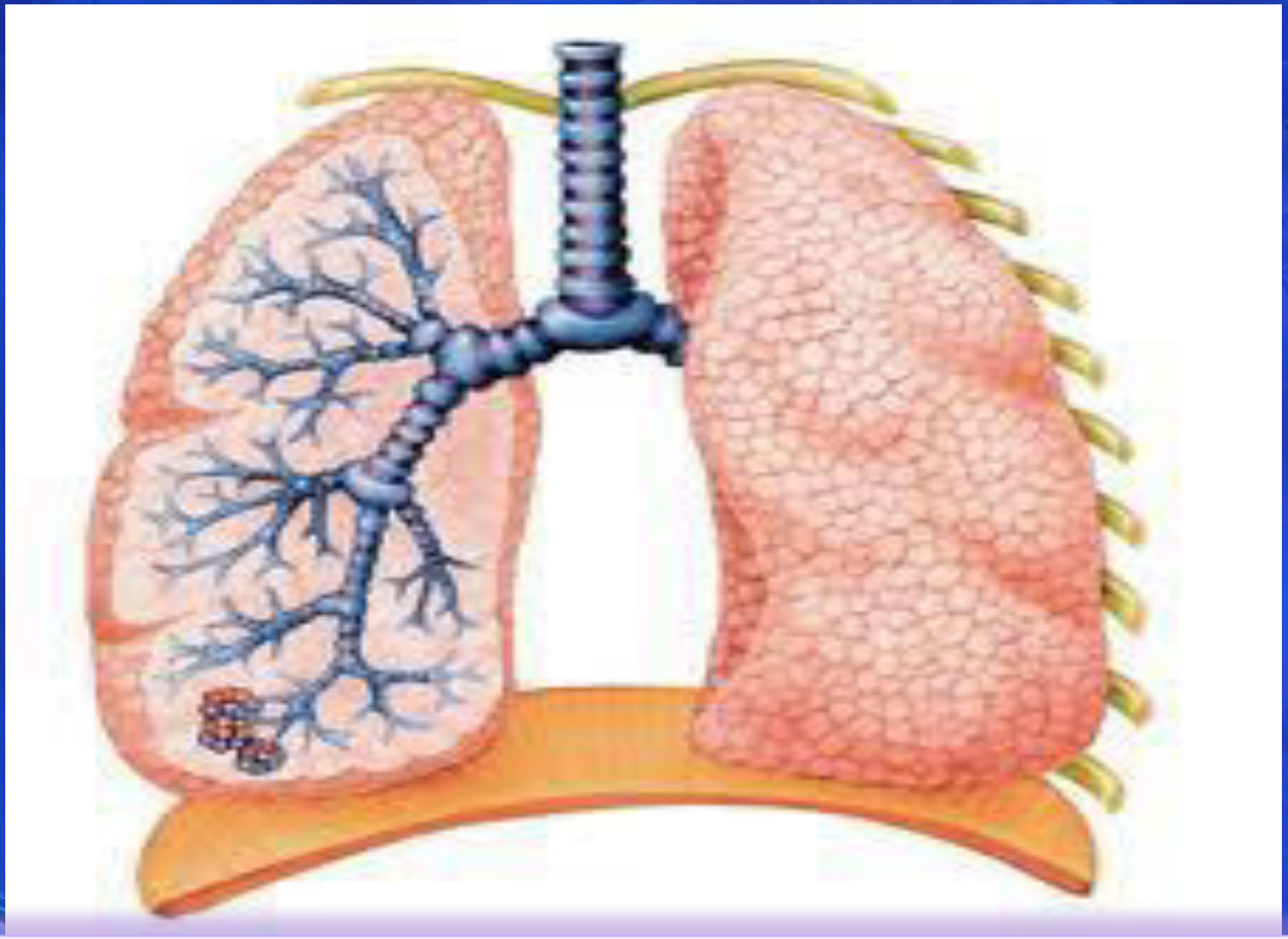
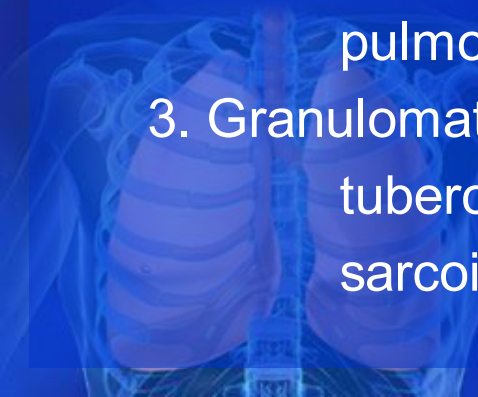


Oral manifestation of Respiratory system disorder

Calcification of respiratory system disorder

1. The upper respiratory tract
   - viral respiratory tract
   - allergic rhinitis
   - pharyngitis and tonisilitis
   - sinusitis
2. The lower respiratory tract
   - pneumonia
   - asthma
   - COPD
   - cystic fibrosis
   - pulmonary embolism
3. Granulomatous disease
   - tuberculosis
   - sarcoidosis



4. Malignant disorder
    - lung cancer
5. Other respiratory disorder
    - legionnaire's disease
    - lung abscess
    - bronchiectasis
    - obstructive sleep apnea
    - occupational lung disease

The upper respiratory tract

Viral respiratory tract

The most common cause of acute respiratory illness is viral infection, which occurs more commonly in children than in adults. Rhinoviruses account for the majority of upper-respiratory infections in adults

Rhinoviruses are most commonly transmitted by close persontoperson contact and by respiratory droplets. Shedding can occur from nasopharyngeal secretions for up to 3 weeks, but 7 days or less is more typical. In addition to rhinoviruses, several other viruses, including *Coronavirus, influenza virus,* parainfluenza virus, adenovirus, *Enterovirus, coxsackievirus,* and respiratory syncytial virus, have also been implicated as causative agents. Infection by these viruses occurs more commonly during the winter months in temperate climates

- **PATHOPHYSIOLOGY**
- Viral particles can lodge in either the upper or lower respiratory
- tract. The particles invade the respiratory epithelium,
- and viral replication ensues shortly thereafter. The typical
- incubation period for *Rhinovirus is 2 to 5 days.2 During this*
- time, active and specific immune responses are triggered,
- and mechanisms for viral clearance are enhanced. The period
- of communicability tends to correlate with the duration of

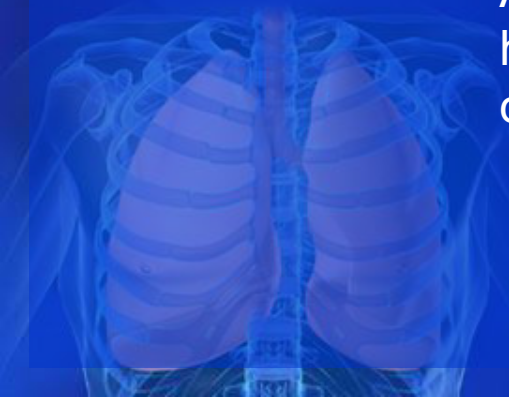
- **CLINICAL AND LABORATORY FINDINGS**
- Signs and symptoms of upper-respiratory-tract infections are
- somewhat variable and are dependent on the sites of inoculation.
- 3 Common symptoms include rhinorrhea, nasal congestion,
- and oropharyngeal irritation. Nasal secretions can be
- serous or purulent. Other symptoms that may be present include
- cough, fever, malaise, fatigue, headache, and myalgia.4 A complete
- blood count (CBC) with differential shows an increase in

MANAGEMENT

The treatment of upper respiratory infections is symptomatic as most are self-limited.Analgesics can be used for sore throat and myalgias.Antipyretics can be used in febrile patients, and anticholinergic agents may be helpful in reducing rhinorrhea.

Oral or topical decongestants, such as the sympathomimetic amines, are an effective means of decreasing nasal congestion.

Adequate hydration is also important in homeostasis, especially during febrile illnesses.



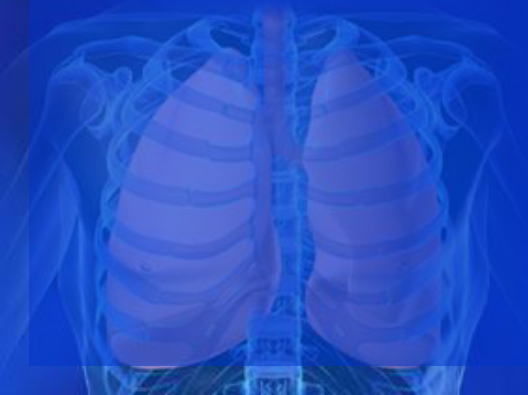
- **ORAL HEALTH CONSIDERATIONS**
- The most common oral manifestation of upper respiratory
- viral infections is the presence of small round erythematous
- macular lesions on the soft palate. These lesions may be caused directly by the viral infection, or they may represent a response
- of lymphoid tissue. Individuals with excessive lingual tonsillar tissue also experience enlargement of these foci of lymphoid tissue,
- particularly at the lateral borders at the base of the tongue.

Sinusitis

- Defined - inflammation of the epithelial lining of the paranasal sinuses. The inflammation of these tissues causes mucosal edema and an increase in mucosal secretions.
- Triggering factors - acute upper respiratory infection other causes dental infections and direct trauma.
- If blockage of sinus drainage occurs, retained secretions can promote bacterial growth and subsequent acute bacterial sinusitis.

CLASSIFICATION

- Duration of the inflammation and underlying infection - acute or chronic,.
- Chronic - persistent symptoms for 3 to 8 weeks.



Etiology

- Acute sinusitis - Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis.
- Acute sinusitis, Bacteroides spp and Staphylococcus aureus are causative.
- Chronic sinusitis - Bacteroides spp, Fusobacterium spp, Streptococcus, Veillonella, and Corynebacterium spp.
- Sinusitis due to a fungal infection can rarely occur, usually in immunocompromised patients.

PATHOPHYSIOLOGY

Rhythmic ciliary movement and the clearance of secretions can be impaired by several factors, including viral upper respiratory infections, allergic inflammation, and exposure to tobacco smoke and other irritants. In addition, foreign bodies (accidental or surgical) or a severely deviated nasal septum can cause obstruction.

If blockage of the sinus ostia or → obstruction of the ostio meatal complex occurs, → stasis of sinus secretions will allow pooling in the sinus cavities, → which facilitates bacterial growth

Clinical finding

- Acute - facial pain, tenderness, and headache localized to the affected region.
- Sinusitis - sphenoid sinuses headache or pain in the occipital region.
- Other symptoms –purulent nasal discharge, fever, malaise, and postnasal drainage with fetid breath. Occasionally, there may be toothache or pain with mastication.
- Chronic sinusitis -vague and poorly localized.
- Pt c/o of chronic rhinorrhea, postnasal drainage, nasal congestion, sore throat, facial “fullness,” .

LABORATORY FINDINGS

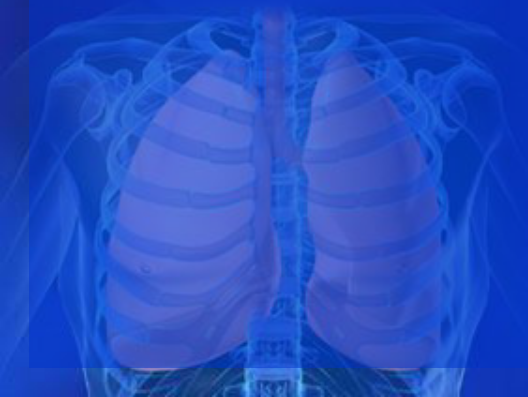
- Although not often needed, plain-film sinus radiography
- can be helpful in the diagnosis of acute maxillary or frontal
- sinusitis. Poor visualization of the ethmoid sinuses and limited
- visualization of the sphenoid sinuses affect the usefulness of
- this type of radiography. Plain-film radiography is not helpful
- for establishing osteomeatal complex disease.21 Computed
- tomography (CT) is the study of choice for documenting
- chronic sinusitis with underlying disease of the osteomeatal
- complex and is superior to magnetic resonance imaging (MRI)
- for the identification of bony abnormalities. CT can also accurately
- assess polyps, reactive osteitis,mucosal thickening, and
- fungal sinusitis

DIAGNOSIS

- The diagnosis of acute sinusitis is made on the basis of history
- and physical examination. As previously noted, radiologic
- evaluations might be helpful in certain situations. Patients
- with recurrent disease need to be evaluated for underlying factors
- that can predispose to sinusitis. Allergy evaluation for
- allergic rhinitis is often helpful. Other predisposing factors
- such as tobacco smoke exposure, immunodeficiency, and septal
- deviation should be considered.23
- CT usually aids the diagnosis of chronic sinusitis.
- Evaluation of the osteomeatal complex is crucial in the management
- of these patients. In addition, rhinoscopy may be
- helpful for direct visualization of sinus ostia.

MANAGEMENT

- Initial medical treatment consists of antibiotics to cover the
- suspected pathogens, along with topical or oral decongestants
- to facilitate sinus drainage. First-line antibiotics such as amoxicillin
- are often effective although second-generation
- cephalosporins, clarithromycin, and amoxicillin plus clavulanate
- can be helpful in resistant cases. Many patients who
- also have underlying allergic rhinitis may benefit from the
- addition of a topical nasal corticosteroid (many are available).
- Treatment courses often last 2 to 3 weeks. Acute frontal or
- sphenoid sinusitis is very serious because of the potential for



- intracranial complications. Intravenous antibiotics are indicated,
- and surgical intervention is considered, based on the
- condition’s response to medical management.24
- The management of chronic sinusitis involves antibiotics
- of a broader spectrum, and a prolonged treatment course may
- be required.25 Topical corticosteroids or short courses of oral
- corticosteroids may help reduce the swelling and/or obstruction
- of the osteomeatal complex.26 Avoidance of exacerbating
- factors such as allergens or tobacco smoke should be emphasized.
- Patients with histories suggestive of allergy should
- undergo a thorough allergy evaluation.
- Patients who have chronic sinusitis with evidence of disease
- of the osteomeatal complex who fail medical management
- often require surgical intervention. Functional endoscopic
- sinus surgery involves the removal of the osteomeatal obstruction
- through an intranasal approach. This procedure can be
- performed with either local or general anesthesia and without
- an external incision. The recovery time from this procedure is
- short, and morbidity is generally low

PROGNOSIS

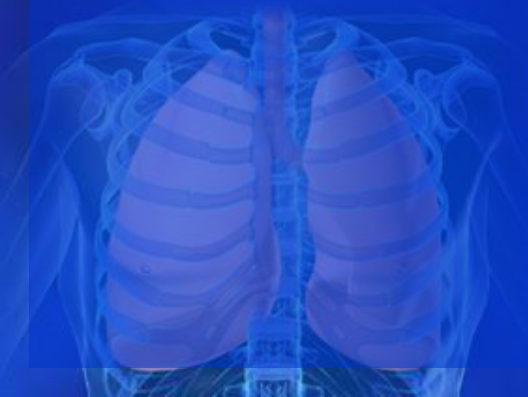
Patients treated for acute sinusitis usually recover without sequelae. Children with sinusitis, particularly ethmoid and maxillary sinusitis, are at risk for periorbital or orbital cellulitis. Periorbital cellulitis is most often treated with intravenous antibiotics. Orbital cellulitis, on the other hand, requires prompt surgical intervention to prevent involvement of the globe or intracranial structures.

Frontal sinusitis can extend through the anterior wall and present as Pott's puffy tumor. Sinusitis can also spread intracranially and result in abscess or meningitis. These complications, although uncommon, are more likely to occur in male adolescent patients.

Patients with chronic sinusitis are more likely to require a prolonged recovery period, with a resultant decrease in quality of life. Chronic medication use can lead to side effects or other complications, such as rhinitis medicamentosa from prolonged use of topical decongestants. Surgical intervention and underlying-factor assessment will often reverse the chronic process, leading to an improvement in quality of life

ORAL HEALTH CONSIDERATIONS

- Differentiate between an odontogenic infection and sinus pain..
- Chronic sinus infections are often accompanied by mouth breathing. This condition is associated with oral dryness and increased susceptibility to oral conditions such as gingivitis.



Laryngitis and Laryngotracheobronchitis

- The upper airway is the site of infection and inflammation
- during the course of a common cold, but respiratory viruses
- can attack any portion of the respiratory tree. Laryngitis is
- defined as an inflammation of the larynx, usually because of a
- viral infection. Laryngotracheobronchitis (also termed viral
- croup) is an inflammation (also due to a viral illness) involving
- the larynx, trachea, and large bronchi. Although these illnesses
- have distinct presenting features, both result from a
- similar infectious process and the reactive inflammation that
- follows. Laryngitis can present at any age although it is more
- common among the adult population.28 In contrast, laryngotracheobronchitis
- is an illness seen primarily in young children
- and has a peak incidence in the second and third years of life.
- These infections are most common during the fall and winter
- months, when respiratory viruses are more prevalent.
- The viruses most commonly implicated in laryngitis are
- the coxsackieviruses, adenoviruses, and herpes simplex virus.
- The viruses most commonly associated with laryngotracheobronchitis
- are parainfluenza virus, respiratory syncytial virus,
- influenza virus, and adenovirus.29

PATHOPHYSIOLOGY

- The underlying infectious process is quite similar to that seen
- in viral infections of the upper respiratory tract (see above).
- After infection of the respiratory epithelium occurs, an
- inflammatory response consisting of mononuclear cells and
- polymorphonuclear leukocytes is mounted. As a result, vascular
- congestion and edema develop. Denudation of areas of
- respiratory epithelium can result. In addition to edema, spasm of laryngeal muscles can occur. Because the inflammatory process is triggered by viral infection, the disease processes are usually self-limited.

- **CLINICAL AND LABORATORY FINDINGS**
- Patients with laryngitis usually have an antecedent viral upper
- respiratory infection. Complaints of fever and sore throat are
- common. The most common manifestation of laryngitis is
- hoarseness, with weak or faint speech.30 Cough is somewhat
- variable in presentation and is more likely when the lower respiratory
- tract is involved.
- Children presenting with viral croup commonly have an
- antecedent upper respiratory infection, which may include
- fever. Shortly thereafter, a barking cough and intermittent stridor
- develop. Stridor at rest, retractions, and cyanosis can occur in children with severer inflammation.Neck radiography will
- demonstrate subglottic narrowing (a finding termed “steeple
- sign”) on an anteroposterior view.

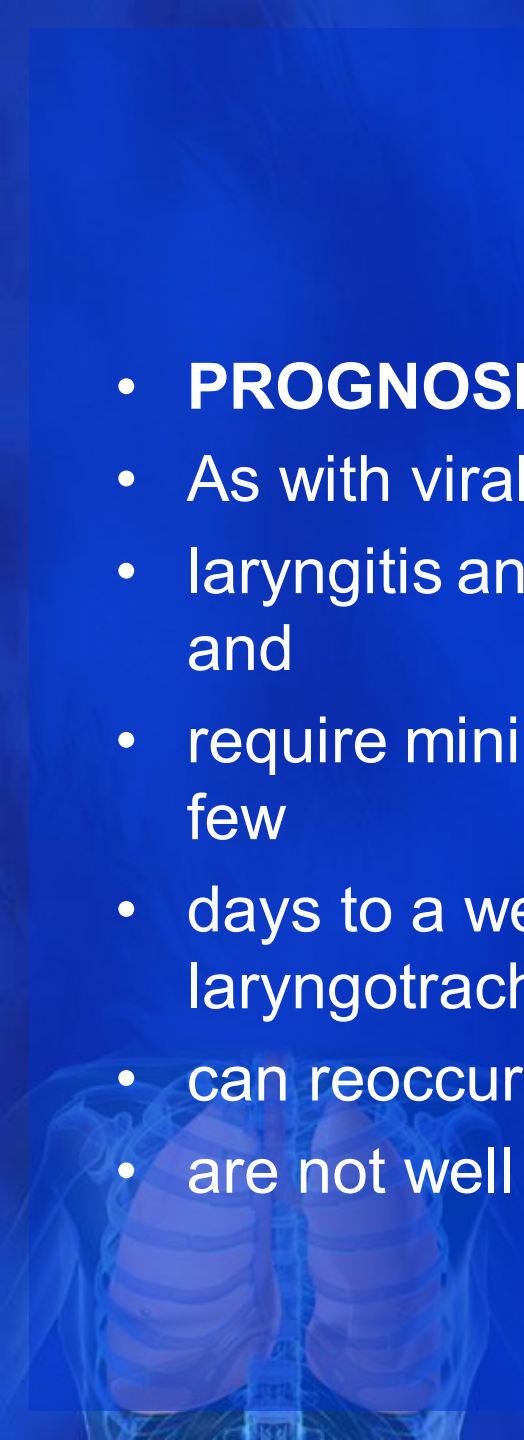
DIAGNOSIS

- The diagnosis of laryngitis is based on the suggestive history.
- There are no specific findings on physical examination or laboratory
- tests although the presence of hoarseness is suggestive.
- The differential diagnosis includes other causes of laryngeal
- edema, including obstruction of venous or lymphatic
- drainage from masses or other lesions, decreased plasma
- oncotic pressure from protein loss or malnutrition, increased
- capillary permeability, myxedema of hypothyroidism, and
- hereditary angioedema. Carcinoma of the larynx can also present
- with hoarseness.
- The diagnosis of laryngotracheobronchitis is usually
- apparent and is based on a suggestive history, with radiography
- confirming the clinical impression. With children, it is
- important to rule out other causes of stridor, including foreign
- body aspiration, acute bacterial epiglottitis, and
- retropharyngeal abscess.

MANAGEMENT

- Most cases of laryngitis are mild and self-limited, so only supportive
- care need be prescribed.The use of oral corticosteroids
- in severe or prolonged cases can be considered although their
- routine use is controversial.32
- Treatment of laryngotracheobronchitis is also supportive.
- Cool-mist therapy and hydration are usually sufficient treatment.
- Hospitalization is usually indicated for patients with
- stridor at rest. Although somewhat controversial, a short
- course of oral or parenteral corticosteroids can reduce
- inflammation and help hasten recovery.33,34 Nebulized
- racemic epinephrine has been shown to temporarily relieve
- airway obstruction although rebound airway edema is common.
- 35 The uncommon patient with impending respiratory
- failure requires endotracheal intubation or tracheotomy if
- intubation fails.

- **PROGNOSIS**
- As with viral upper respiratory infections, most cases of
- laryngitis and laryngotracheobronchitis are self-limited and
- require minimal medical intervention. Recovery within a few
- days to a week is the rule. In some cases, laryngotracheobronchitis
- can reoccur although the factors influencing this
- are not well understood.

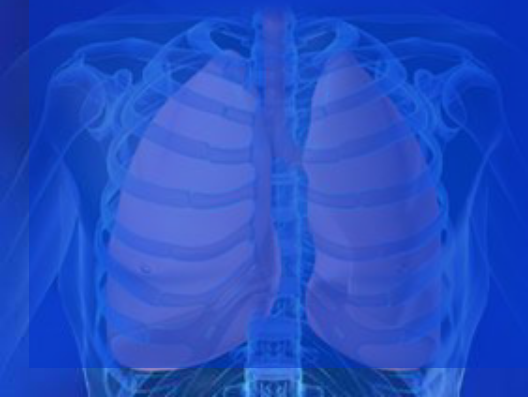


Pharyngitis and Tonsillitis

- More than 90% of sore throat are related to viral infections.
- Infections can be associated with fever, rhinorrhea, and cough.
- Viral etiology - epstein-barr virus, coxsackievirus A, adenovirus, rhinovirus, and measles virus.36
- Bacterial cause - tonsillopharyngitis is group A beta-hemolytic streptococcus (GABHS) infection, specifically streptococcus pyogenes infection.
- Proper diagnosis and treatment of this infection is extremely important in order to prevent disease sequelae, namely, acute rheumatic fever and glomerulonephritis.
- Chronic mouth breathing, chronic postnasal drainage, and inflammation due to irritant exposure can also cause pharyngitis t and tonsillitis.

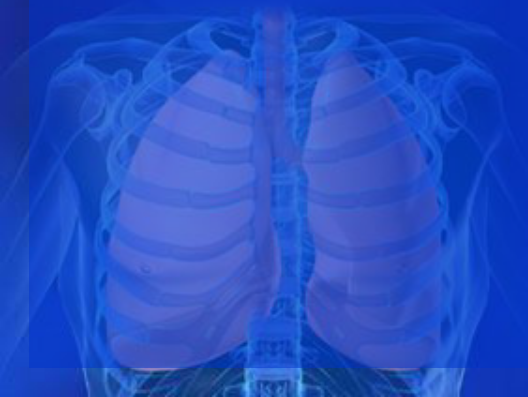
PATHOPHYSIOLOGY

- Streptococcal infections are spread through direct contact with respiratory secretions.
- Transmission is often facilitated in areas where close contact occurs, such as schools and day care centers.
- The incubation period is 2 to 5 days.



CLINICAL AND LABORATORY FINDINGS

- Sore throat is the predominant symptom.
- Pt with Epstein-Barr virus infections develop infectious mononucleosis, a disease characterized by exudative tonsillopharyngitis, lymphadenopathy, fever, and fatigue. Physical examination can reveal hepatosplenomegaly



- .Common laboratory findings
- include leukocytosis with more than 20% atypical lymphocytes
- on blood smear. Blood chemistries may reveal elevated
- liver enzymes.
- Infection with coxsackievirus can cause several distinct illnesses,
- each associated with tonsillopharyngitis.Herpangina is
- a disease that is characterized by ulcers that are 2 to 3 mm in
- size and located on the anterior tonsillar pillars and possibly the
- uvula and soft palate. Hand-foot-and-mouth disease is characterized
- by ulcers on the tongue and oral mucosa, in association
- with vesicles found on the palms and/or soles. Small yellow-
- white nodules on the anterior tonsillar pillars characterize
- lymphonodular pharyngitis; these nodules do not ulcerate.
- Pharyngoconjunctival fever is a disorder characterized by
- exudative tonsillopharyngitis, conjunctivitis, and fever.
- Infection is due to an adenovirus. Measles is a disease with a prodromal phase that is characterized
- by symptoms of upper respiratory infection, tonsillopharyngitis,

- **DIAGNOSIS**
- Diagnosis is based on a history of sore throat and is established
- by appropriate physical findings and results of a throat culture
- (see above). A rapid antigen detection test is available for diagnosing
- streptococcal pharyngitis. The test has a high specificity
- (95%+) but a low sensitivity (60 to 95%). Therefore,
- negative results should be confirmed by throat culture.
- Antistreptolysin O titers rise about 150 U within 2 weeks
- of acute infection. These titers are useful for documenting recent streptococcal infections, especially in the course of acute rheumatic fever

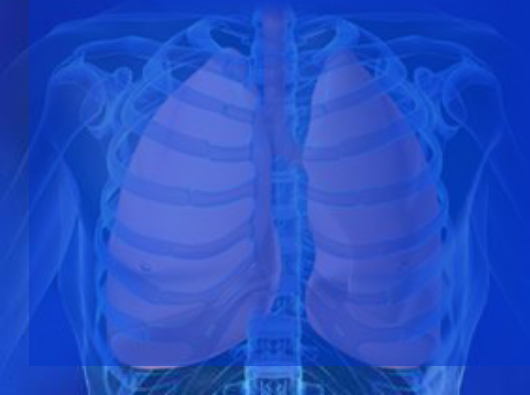
- **MANAGEMENT**
- The viral causes of tonsillopharyngitis are treated symptomatically.
- Gargle solutions, analgesics, and antipyretics are often helpful. The course is always self-limited.5
- Acute streptococcal pharyngitis is treated with a 10-day course of oral penicillin V or erythromycin (for penicillinsensitive individuals). Alternatives include an intramuscular injection of benzathine penicillin G or oral cephalosporins.
- Failure rates for penicillin vary from 6 to 23%, so an additional antibiotic course may be necessar

- **PROGNOSIS**
- The prognosis for viral tonsillopharyngitis is very good as the
- infections are self-limited. Late sequelae from group A streptococcal
- tonsillitis can be avoided by prompt diagnosis and
- treatment.38 Other complications due to streptococcal tonsillitis
- are uncommon but include cervical adenitis, peritonsillar
- abscesses, otitis media, cellulitis, and septicemia

- **ORAL HEALTH CONSIDERATIONS**
- The association between GABHS infection and the development
- of severe complications, such as rheumatic fever and its
- associated heart condition, is well known. Although failure to
- successfully treat GABHS infections was more common in the
- pre-penicillin era, there are some concerns today regarding
- re-infection in cases in which penicillin is unable to eradicate
- the organism. One study found a significant association
- between the persistence of GABHS on toothbrushes and
- removable orthodontic appliances and the recovery of GABHS
- in the oropharynx of symptomatic patients after 10 days of
- treatment with penicillin.39 Interestingly, when toothbrushes
- were rinsed with sterile water, organisms could not be cultured
- beyond 3 days whereas nonrinsed toothbrushes harbored
- GABHS for up to 15 days. Thus, patients with GABHS
- infections should be instructed to thoroughly clean their
- toothbrushes and removable acrylic appliances daily. It is also
- advisable to change to a new toothbrush after the acute stage
- of any oropharyngeal infections

Pneumonia

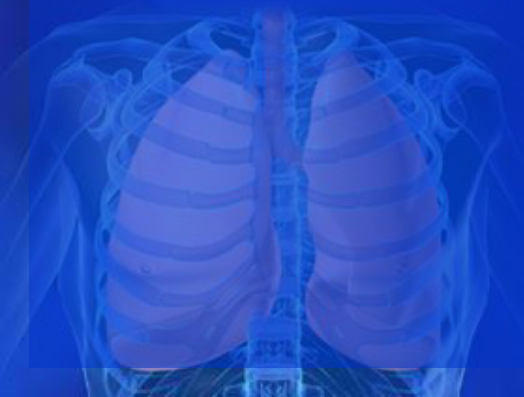
acute lower respiratory tract (*LRT) illness, usually but not always due to infection,* associated with *fever, focal chest symptoms (with or without clinical signs) and new shadowing on chest radiography*



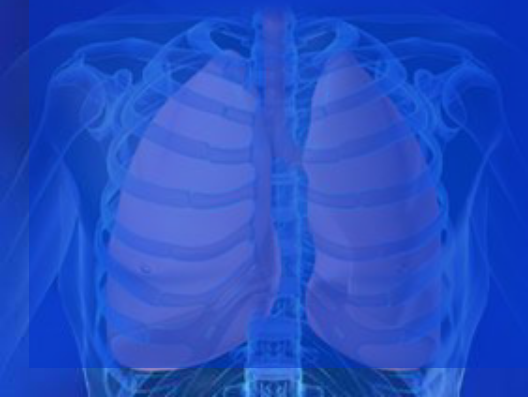
- Pneumonia is a condition that involves ***inflammation of lower lung structures such as the alveoli or interstitial spaces*****.**
- It may be **caused by** bacteria or viruses such as *pneumocystis carinii*.
- The prevalence and severity of pneumonia have been heightened in recent years due to the emergence of HIV as well as antibiotic resistance.
- Pneumonia may be **classified according to** the pathogen that is responsible for the infection.
- There tend to be distinct organisms that cause pneumonia in the hospital setting vs. the community setting.

Individuals Most at Risk for Pneumonia

- Elderly
- Those with viral infection
- Chronically ill
- AIDS or immunosuppressed patients
- Smokers
- Patients with chronic respiratory disease e.g. bronchial asthma.

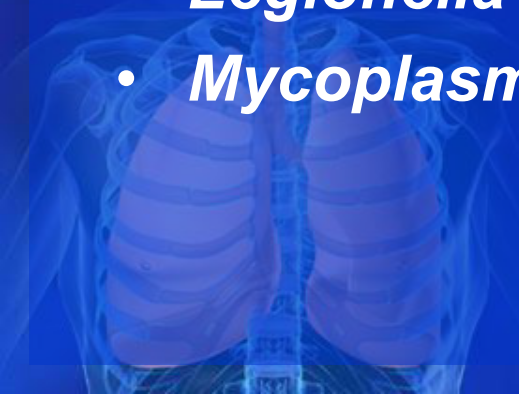


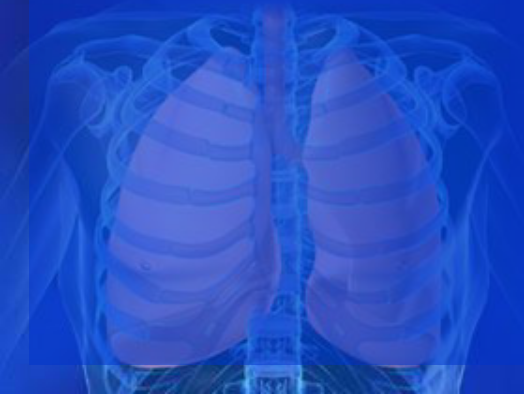
- • Community acquired pneumonia (CAP)
- • Aspiration pneumonia
- • Hospital
- – Hospital acquired pneumonia (HAP)
- – Ventilator associated pneumonia (VAP)
- – Healthcare associated pneumonia (HCAP)



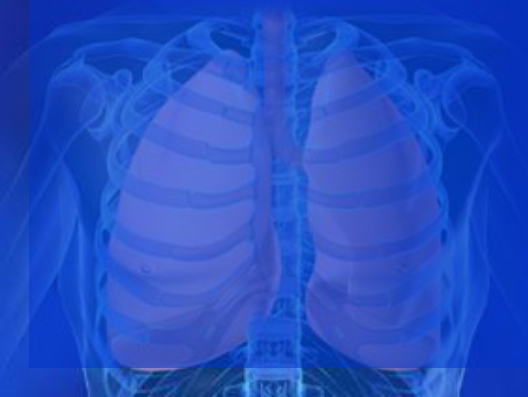
Potential Pathogens

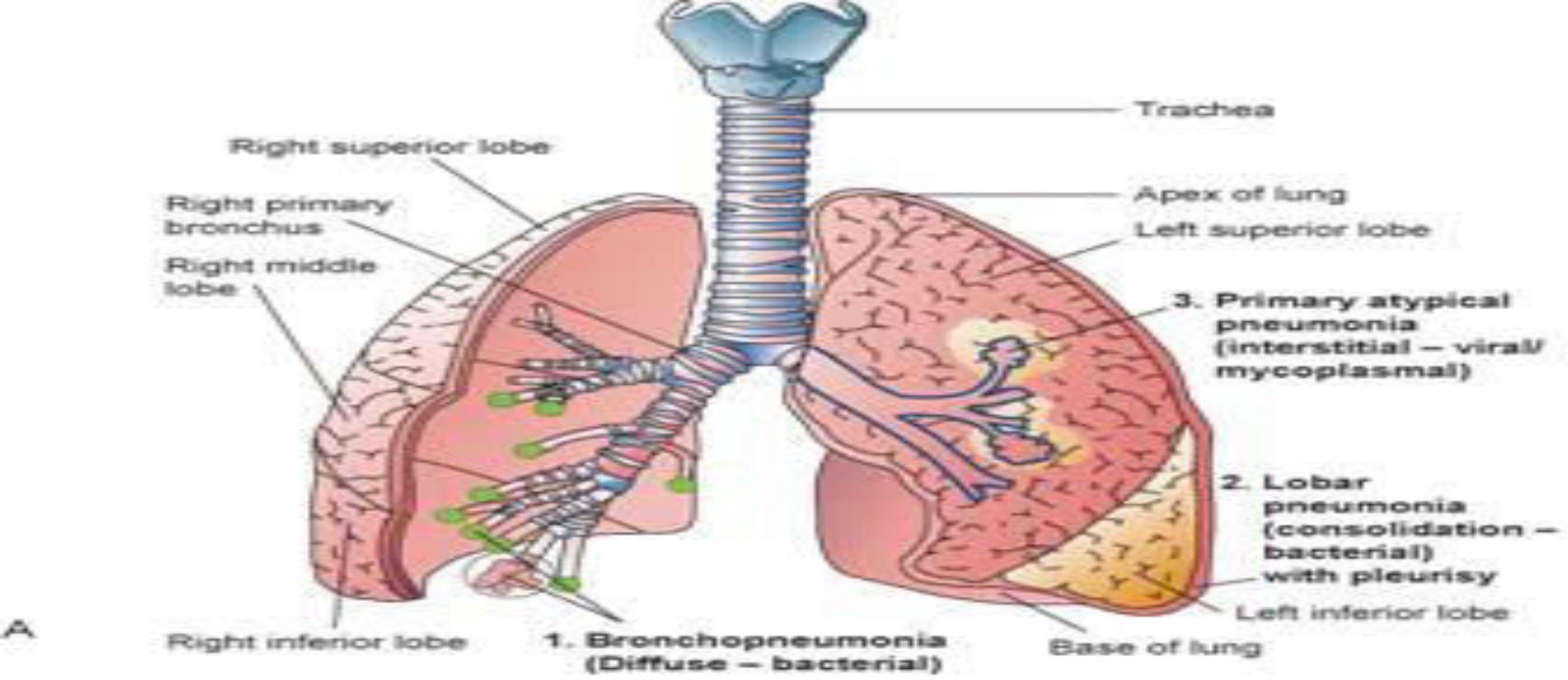
- **Typical**
- ***Streptococcus pneumoniae***
- ***Hemophilus influenzae***
- ***Mycobacterium catarrhalis***
- ***Klebsiella pneumoniae***
- **Atypical**
- ***Chlamydia pneumoniae***
- ***Legionella pneumophila***
- ***Mycoplasma pneumoniae.***

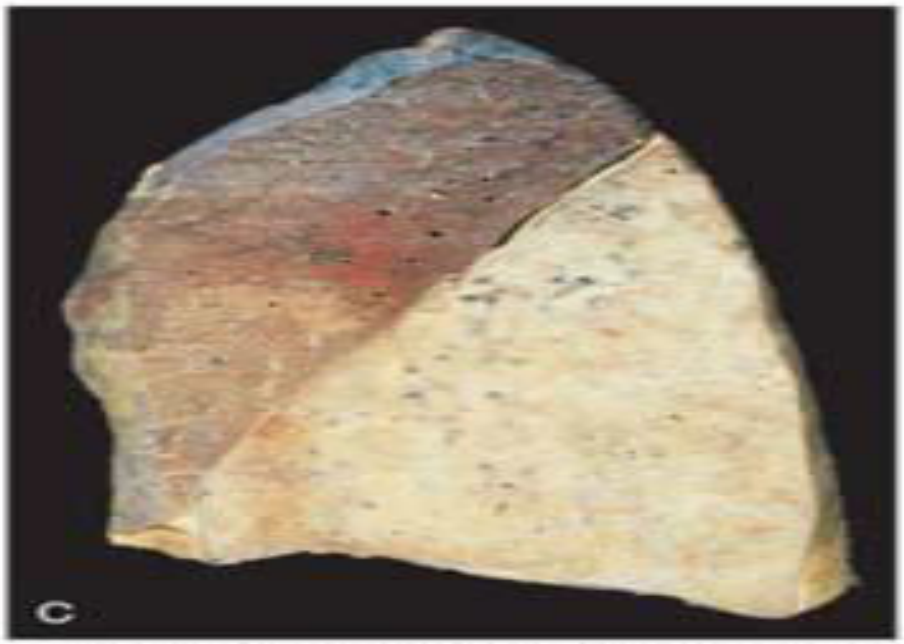




- • Viruses
- • Fungi
- • Less Common pathogens
- – *N. meningitidis*
- – *Chlamydia psittaci*
- – *B. anthracis*
- – *Y. pestis*







A second classification scheme for pneumonia is based on the specific structures of the lung that the organisms infect and includes *typical* and *atypical* pneumonia.

Typical pneumonia

- Usually bacterial in origin.
- Organisms replicate in the spaces of the alveoli.

Manifestations:

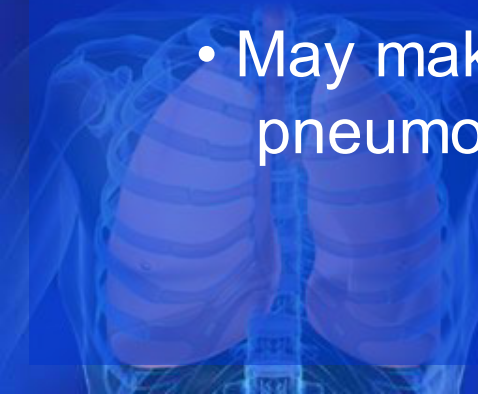
- Inflammation and fluid accumulation are seen in the alveoli.
- White cell infiltration and exudation can been seen on chest radiographs.
- High fever, chest pain, chills, and malaise are present.
- Purulent sputum is present.
- Some degree of hypoxemia is present.

Atypical pneumonia

- Usually viral in origin.
- Organisms replicate in the spaces around the alveoli.

Manifestations:

- Milder symptoms than typical pneumonia.
- Lack of white cell infiltration in alveoli.
- Lack of fluid accumulation in the alveoli.
- Not usually evident on radiographs.
- May make the patient susceptible to bacterial pneumonia.

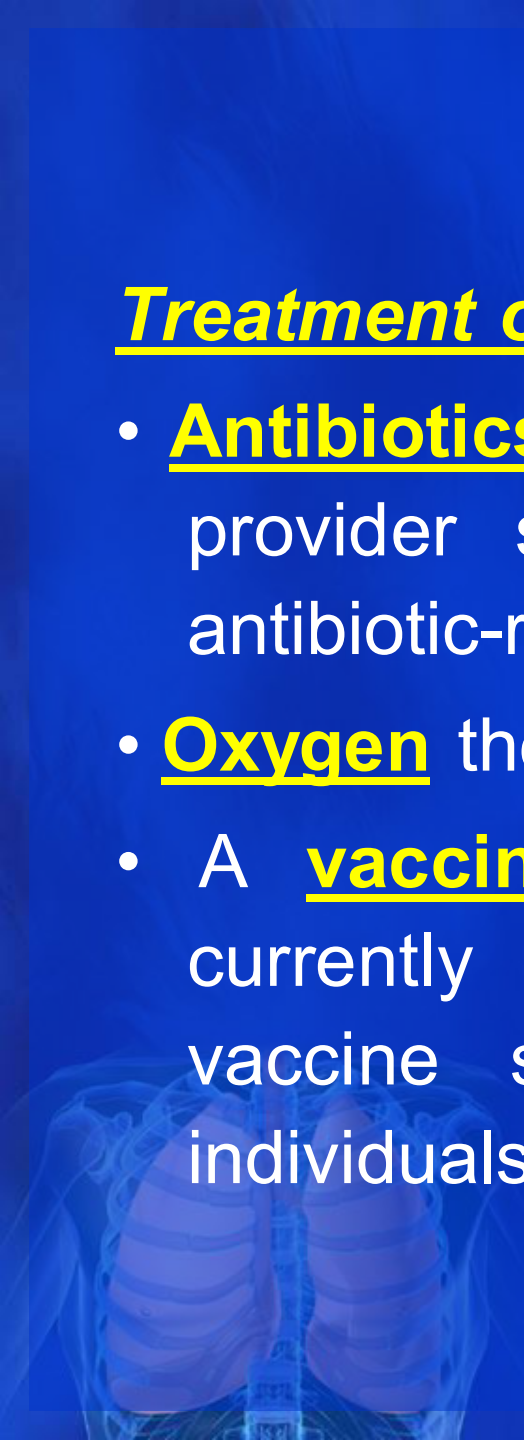


Opportunistic organisms

- A number of organisms not commonly associated with respiratory illness in otherwise healthy individuals can cause severe respiratory infections and pneumonia in patients with HIV or those who are immunocompromised as a result of immune suppressive therapy.
- These organisms include mycobacteria, fungus (*Histoplasma)* and protozoa (*Pneumocystis carinii)*.
- Treatment of these organisms requires specific drug therapy, and, in the case of protozoa and fungi, the organisms are very difficult to kill.

Treatment of pneumonia:

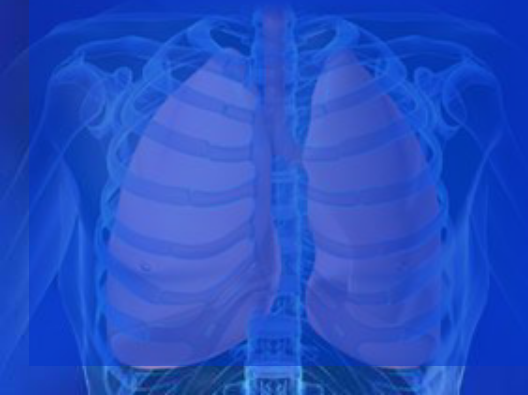
- **Antibiotics** if bacterial in origin. The health-care provider should consider the possibility that antibiotic-resistant organisms are present.
- **Oxygen** therapy for hypoxemia.
- A **vaccine** for *pneumococcal* pneumonia is currently available and highly effective. This vaccine should be considered in high-risk individuals.



Bronchial asthma

Definition

A disease characterized by a increased responsiveness of trachea and bronchi to various stimuli and manifested by widespread narrowing of the airway that change in severity either spontaneously or as a result of therapy



Clinical Classification of Asthma

- **Mild intermittent** : Attacks occur 2 times per week or less
- **Mild persistent** : Attacks occur more than 2 times per week
- **Moderate persistent** : Attacks occur daily or almost daily and are severe enough to affect activity
- **Severe persistent** : Attacks are very frequent and persist for a long period of time; attacks severely limit activity

British Guideline on the Management of Asthma—A National Clinical Guideline (2008) Thorax 63 (Suppl IV): 1–107

CLASSIFICATION OF ASTHMA BY ETIOLOGY

- Aspirin-Induced Asthma
- Coexistent Asthma and Chronic Obstructive Pulmonary Disease
- Cough-Equivalent Asthma
- Exercise-Induced Asthma
- Extrinsic Asthma
- Factitious Asthma
- Intrinsic Asthma
- Mixed Asthma
- Occupational Asthma
- Potentially Fatal Asthma

Reed CE. Aerosol steroids as primary treatment of mild asthma.N Engl J Med 1991;325:425-6.

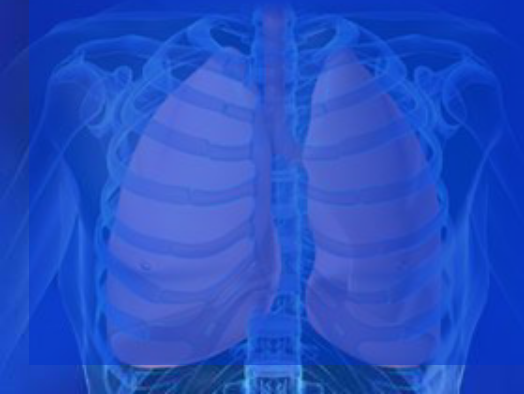
FACTORS THAT PRODUCE AIRWAY OBSTRUCTION IN ASTHMA

- Airway Smooth Muscle Spasm
- Alterations in Respiratory Secretions With Mucous Plugging of
- Smaller Airways

Inflammation

- Eosinophil and lymphocyte infiltration and activation
- Mast cell activation
- Subepithelial collagen deposition
- Denudation of airway epithelium
- Edema of airway mucosa

PATHOPHYSIOLOGY



Early phase of asthma

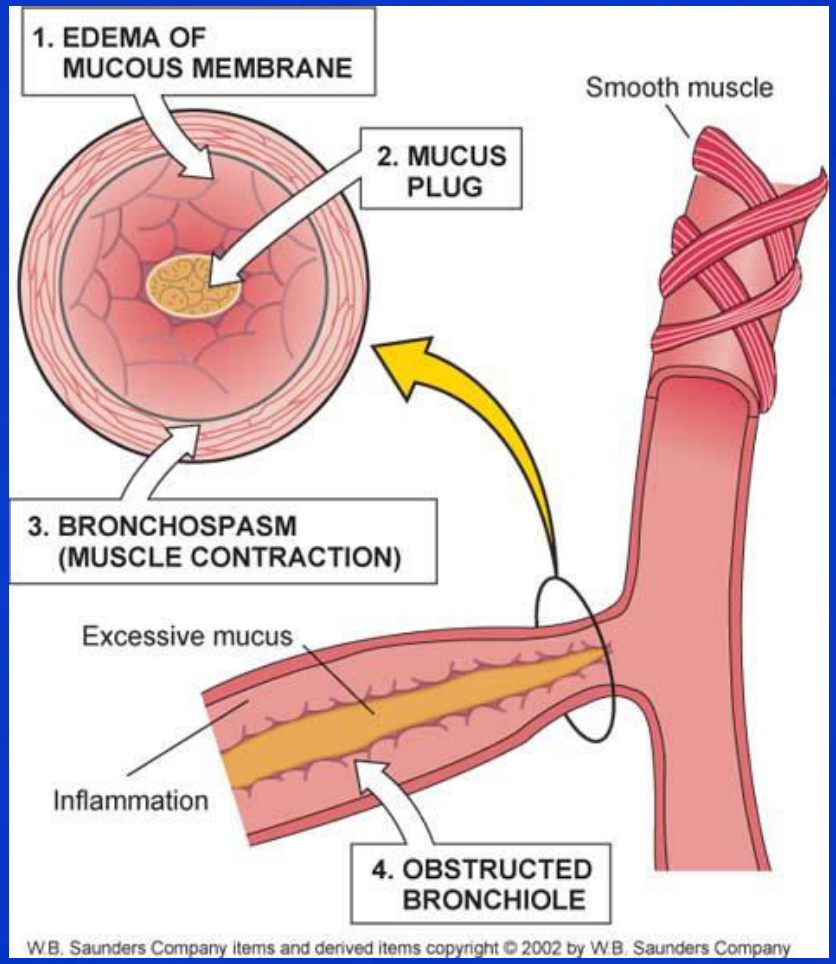
The early phase of asthma is characterized by:

a. **marked constriction of bronchial airways (bronchospasm)**

b. **edema of the airways**

c. **production of excess mucus**.

The bronchospasm that occurs may be the result of the increased release of certain inflammatory mediators such as histamine, prostaglandins and bradykinin that, in the early stages of asthmatic response, promote bronchoconstriction rather than inflammation.



Manifestations of asthma

- Coughing, wheezing, dyspnea, and chest tightness
- Rapid, shallow breathing
- Increased respiratory rate
- Excess mucus production
- Significant anxiety
- worsen at night and in the early morning hours

- triggers include allergens, exercise, cold air, respiratory irritants, emotional extremes, and infections (especially viral infections).

Possible complications of asthma can include :

Possible complications of asthma can include :

- *Severe acute Asthma (status asthmatics),* which is a life-threatening condition of prolonged bronchospasm that is often not responsive to drug therapy.
- *Pneumothorax :* is also a possible consequence as a result of lung pressure increases that can result from the extreme difficulty involved in expiration during a prolonged asthma attack.
- Respiratory failure: marked hypoxemia and acidosis might occur.

TREATMENT GOAL
CONTROL OF ASTHMA

- Minimal (or no) chronic symptoms,
- Including nocturnal symptoms
- Infrequent episodes
- No emergency department visits
- Minimal need for additional β2 agonist
- No limitations on activities, including exercise
- Peak expiratory flow, or PEF, variability
- Of less than 20 percent between PEF
- Measurement on arising in the morning
- And PEF measurement in the afternoon
- Normal or near-normal PEF
- Minimal (or no) adverse effects from medicine

TREATMENT OF ASTHMA

Medication	Route & dosage
Salbutamol	Nebulised: 2.5–5 mg in 2.5 mL normal saline every 15–20 min until clinical improvement or continuous nebulisation at 10 mg/h (both via oxygen driven nebulisers) IV: 3–20 mcg/kg/h
Ipratropium bromide	Nebulised: 500 mcg every 6 h
Corticosteroids	Enteral: Prednisolone 40–60 mg once Daily IV: Hydrocortisone 100 mg every 6 h
Aminophylline	IV: 5 mg/kg loading dose over 20 min (unless taking oral theophyllines) followed by 0.5–0.7 mg/kg/h infusion (guided by theophylline levels)
Magnesium sulphate	IV: 1.2–2 g over 20 min, one dose

Treatment of asthma:

The appropriate drug treatment regimen for asthma is based on the frequency and severity of the asthma attacks and may include the following:

- 1. **Avoidance of triggers, and allergens**. Improved ventilation of the living spaces, use of air conditioning.
- 2. ***Bronchodilators*** (examples: albuterol, terbutaline): Short acting β-*Adrenergic* receptor activators. May be administered as needed in the form of a nebulizer solution using a metered dispenser or may be given subcutaneously. These drugs block bronchoconstriction but *do not* prevent the inflammatory response.

Treatment of asthma:

3.Xanthine drugs (example: theophylline) :

- Cause bronchodilation and also inhibit the late phase of asthma.
- These drugs are often used orally as second-line agents in combination with other asthma therapies such as steroids.
- Drug like theophylline can have significant central nervous system, cardiovascular and gastrointestinal side effects that limit their overall usefulness.

4.Cromolyn sodium :

Anti-inflammatory agent that blocks both the early and late phase of asthma. The mechanism of action is unclear but may involve mast cell function or responsiveness to allergens.

Treatment of asthma:

- 5. Anti-inflammatory drugs **(corticosteroids)** :

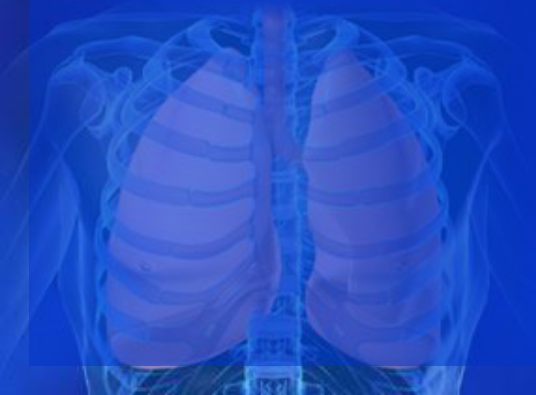
Used orally or by inhalation to blunt the inflammatory response of asthma.

The most significant unwanted effects occur with long-term oral use of corticosteroids and may include immunosuppression , increased susceptibility to infection, osteoporosis and effects on other hormones such as the glucocorticoids.

- 6. Leukotrienes modifiers (example: Zafirlukast) :

New class of agents that blocks the synthesis of the key inflammatory mediators, leukotrienes.

EMERGENCY PROTOCOL FOR MANAGING ASTHMATIC EXACERBATION IN A DENTAL SETTING

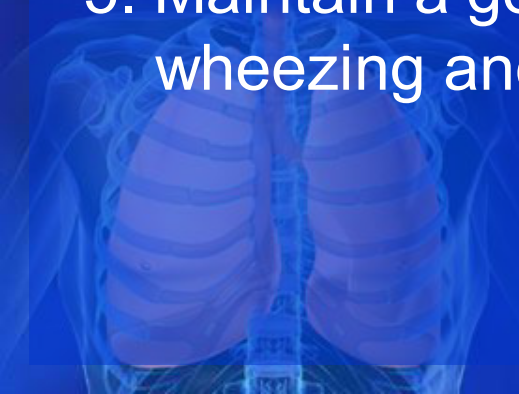


Assessment of severity

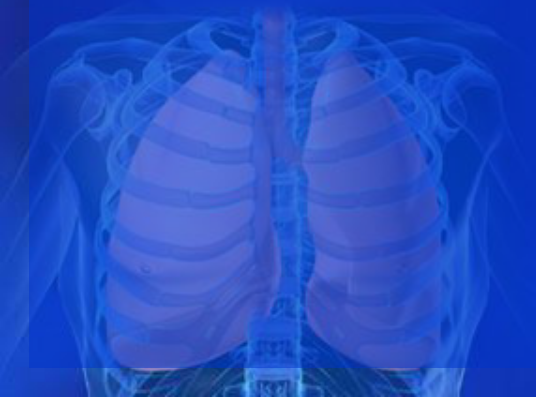
- Acute exacerbations are manifested by episodes of bronchospasm and resulting hypoxia and hypercarbia. Management strategy is directed at determining the level of hypoxia and correcting it.
- The following indicate that the exacerbation is severe:
- Peak expiratory flow rate, or PEFR, is at or below 50 percent of reference value
- Oxygen saturation is below 91 percent;
- Bronchodilator does not improve PEFR by at least 10 percent after two treatments;
- Patient has difficulty speaking;
- Patient is struggling for air.

Managing an Acute Asthmatic Attack

1. Discontinue the dental procedure and allow the patient to assume a comfortable position.
2. Establish and maintain a patent airway and administer β2 agonists via inhaler or nebulizer.
3. Administer oxygen via face mask, nasal hood or cannula. If no improvement is observed and symptoms are worsening, administer epinephrine subcutaneously (1:1,000 solution, 0.01 milligram/ kilogram of body weight to a maximum dose of 0.3 mg).
4. Alert emergency medical services.
5. Maintain a good oxygen level until the patient stops wheezing and/or medical assistance arrives.



DENTAL CARE FOR ASTHMATIC PATIENTS.



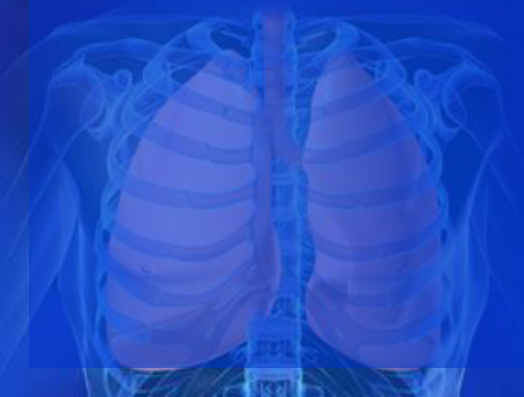
General Oral Health Care Instructions	Before Treatment	During Treatment	After
• Prescribe fluoride supplements for all asthmatic patients, but • especially for those taking β2 agonists • Instruct patients to rinse their mouths after using an inhaler • Reinforce oral hygiene instructions to help minimize gingivitis • Be aware of possible need to prescribe antifungal agents for • patients who chronically use nebulized corticosteroids	• Schedule appointments for late morning or afternoon • Assess severity of asthmatic condition • Consider antibiotic prophylaxis for immunosuppressed patients • Consider corticosteroid replacement for adrenally suppressed • patients • Avoid using dental materials that may elicit an asthmatic attack • Use techniques to reduce the patient's stress:Avoid using barbiturates • Avoid using nitrous oxide in people with severe asthma • Have supplemental oxygen and bronchodilators available in case • of acute asthmatic exacerbation	• Use vasoconstrictors judiciously • Avoid using local anesthetics containing sodium metabisulfite • Use rubber dams judiciously • Avoid eliciting a coughing reflex	• Be aware that some patients may have an adverse reaction to • nonsteroidal anti-inflammatory drugs • Use tetracycline judiciously • Avoid use of erythromycin in patients taking theophylline

COPD

- “Chronic obstructive pulmonary disease” is a term used to describe chronic and largely irreversible airway obstruction due to inflammation of the lower airways. Chronic bronchitis is COPD due to chronic bronchial inflammation. Chronic bronchitis is diagnosed on clinical criteria and is defined as coughing and sputum production for 3 or more months per year for at least 2 consecutive years. Emphysema is diagnosed by histopathology and is defined by enlarged air spaces and the loss of alveolar tissue. The hallmark features of COPD are dyspnea and hypoxemia
- COPD is almost always due to the smoking of tobacco

CLASSIFICATION

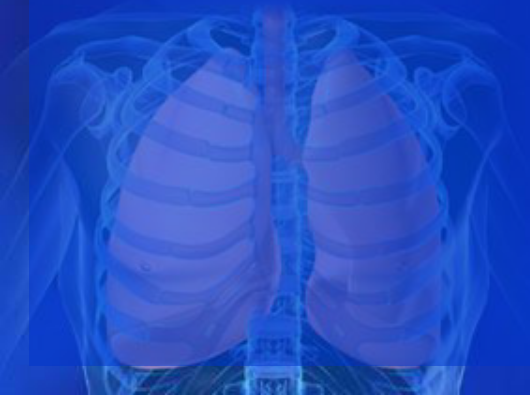
- COPD is traditionally divided into two major categories:
- chronic bronchitis and emphysema. Airway obstruction in
- chronic bronchitis is due to bronchospasm, edema, and
- mucous plugging of the airways as a result of chronic inflammation. In emphysema, airway obstruction occurs because of the loss of lung elasticity and the resultant collapse of the airways.



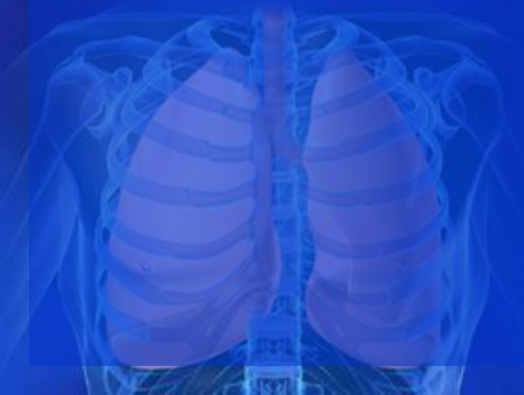
- Many toxins in tobacco smoke can cause a vigorous inflammatory response.Acrolein, for example, causes impairment of both ciliary and macrophage activities. Nitrogen dioxide causes direct toxic damage to the respiratory epithelium. Hydrogen cyanide is responsible for the functional impairment of enzymes that are required for respiratory metabolism. Carbon monoxide causes a decrease in the oxygen-carrying capacity of red blood cells by associating with hemoglobin to form carboxyhemoglobin. Lastly, polycyclic hydrocarbons have been implicated as carcinogens. Episodes of infection can precipitate exacerbations of chronic bronchitis. Patients with chronic bronchitis develop
- bacterial colonization of the tracheobronchial tree. It is

- **CLINICAL AND LABORATORY FINDINGS**
- Patients with chronic bronchitis present with dyspnea, cough,
- and sputum production. An increase in the production of
- often purulent sputum is a sign of exacerbation due to respiratory
- infection. Physical findings include diffuse wheezing,
- possibly associated with signs of respiratory distress including
- the use of accessory muscles of respiration (retractions)
- and tachypnea.103 Liver enlargement due to congestion,
- ascites, and peripheral edema can develop as the disease progresses

Granulomatous disease

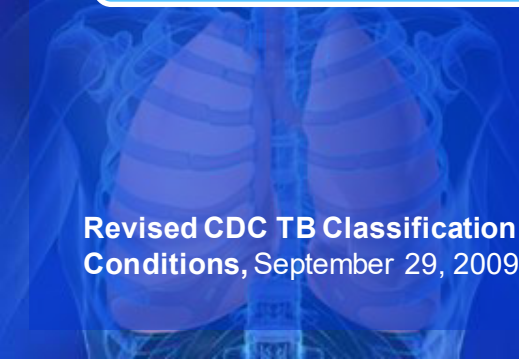


Tuberculosis



CLASSIFICATION

- No TB Classification (Normal)
- Class A TB with waiver, infectious
- Class B1 TB, Pulmonary
- Class B1 TB, Extrapulmonary
- Class B2 TB Latent TB Infection (LTBI) Evaluation
- Class B3 TB, Contact Evaluation

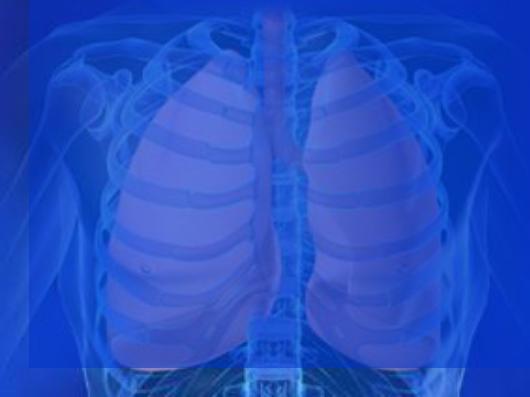


Revised CDC TB Classification system for overseas screening of immigrants and Refugees with Class B1/B2 TB Conditions, September 29, 2009. Accessed 2011-07-27

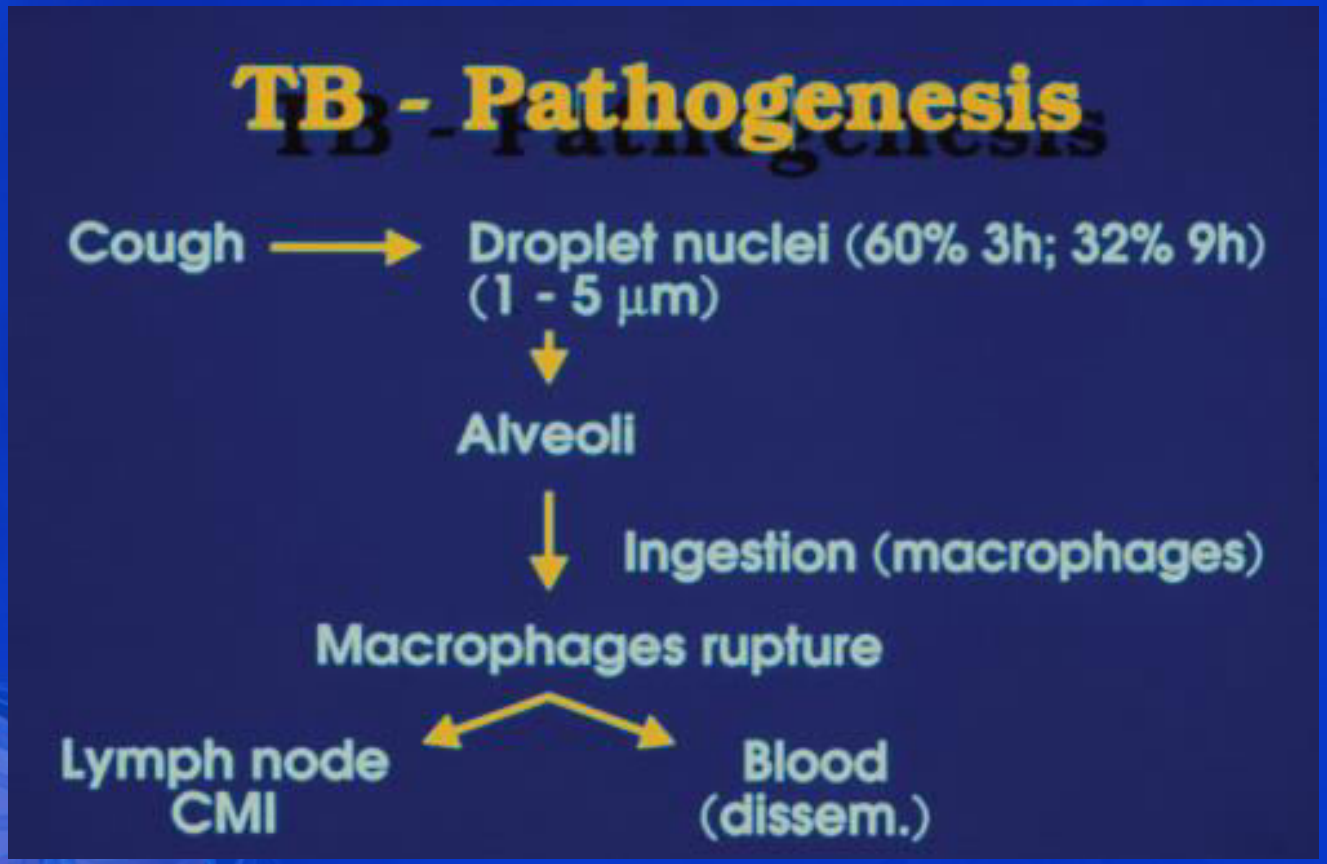
- Nahid P, Pai M, Hopewell P (2006). "Advances in the diagnosis and treatment of tuberculosis". *Proc Am Thorac Soc***3** (1): 103–10.
- Lalvani A, Richeldi L, Kunst H (2005). "Interferon gamma assays for tuberculosis". *Lancet Infect Dis* **5** (6): 322–4;
- Reddy JR, Kwang J, Lechtenberg KF, Khan NC, Prasad RB, Chengappa MM (2002). "An immunochromatographic serological assay for the diagnosis of *Mycobacterium tuberculosis*". *Comp. Immunol. Microbiol. Infect. Dis.* **25** (1): 21–7.
- Guerra RL *et al.* (2007). "Use of the amplified mycobacterium tuberculosis direct test in a public health laboratory: test performance and impact on clinical care".*Chest* **132** (3): 946–51
- **Treatment of Tuberculosis**
  American Thoracic Society, CDC, and Infectious Diseases Society of America
  MMWR: June 20, 2003 / Vol. 52 (RR11): 1-77
- **Updated Guidelines for Using Interferon Gamma Release Assays to Detect *Mycobacterium tuberculosis* Infection — United States, 2010**
  From CDC's MMWR Recommendations and Reports; June 25, 2010 / 59(RR05);1-25

Etiology

- The *M. tuberculosis* complex includes four other TB-causing mycobacteria.
- *M. bovis*,
- *M. africanum*,
- *M. canetti* and
- *M. microti*.

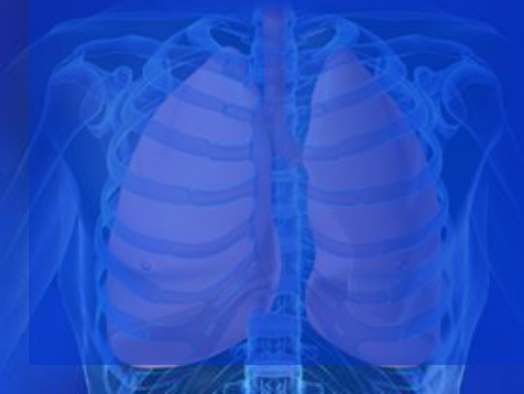


Pathogenesis



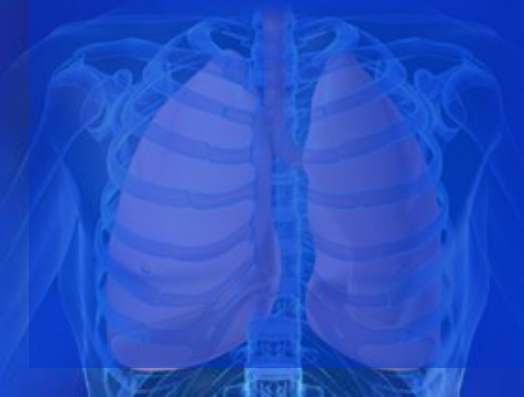
SIGNS AND SYMPTOMS

- Chest pain
- Prolonged Coughing up blood
- Excessive sweating, especially at night
- Fatigue
- Fever
- Breathing difficulty
- Weight loss

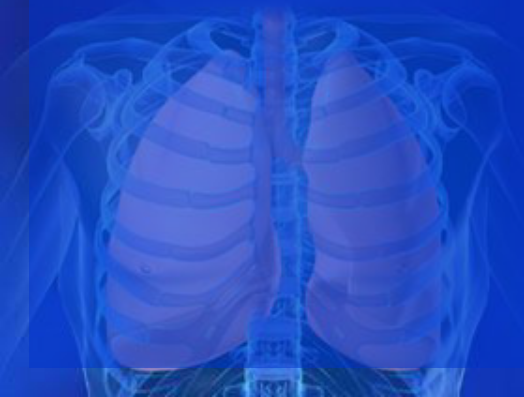


Oral finding

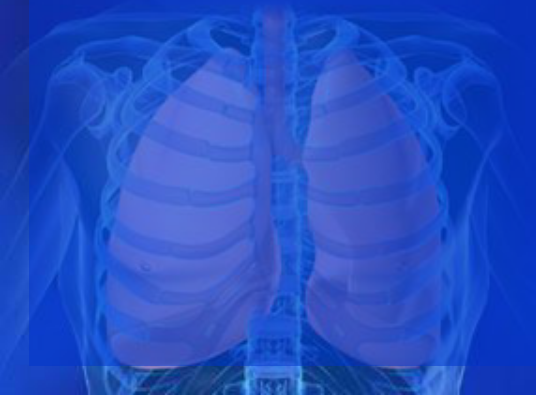
- Ragged painful ulcers on the posterior of the tongue
- Soft tissues and supporting bone and in tooth extraction sites, and may even affect the tongue and floor of the mouth



- **Signs and tests**
- Examination may show:
- Clubbing of the fingers or toes (in people with advanced disease)
- Enlarged or tender lymph nodes in the neck or other areas
- Fluid around a lung (pleural effusion)
- Unusual breath sounds (crackles)



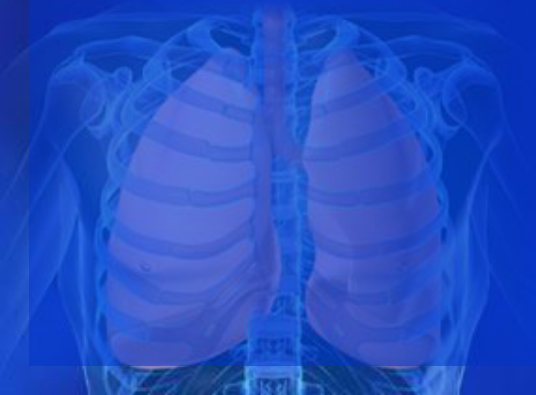
Investigation



Mantoux test

- The Mantoux test for TB involves intradermally injecting PPD (Purified Protein Derivative) tuberculin and measuring the size of induration 48-72 hours later.

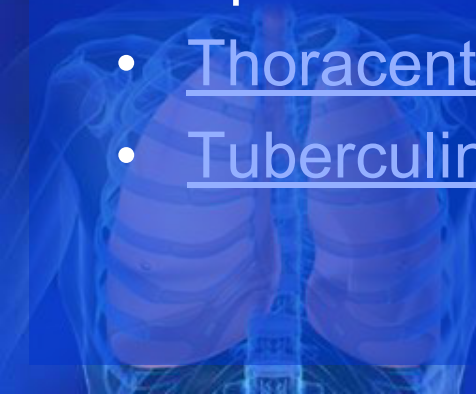
Diagnosis

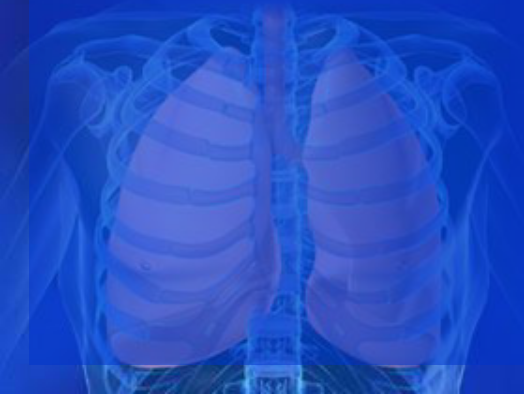


Method	Products	Intended and/or typical use	Level of health system	Main strengths	Main weaknesses
In use					
Smear microscopy for acid-fast bacilli (light microscopy)	Noncommercial	Rapid, point-of-care test for TB case detection	Community	Requires moderate training; minimal infrastructure; minimal equipment	Low sensitivity
Culture on solid media	Many commercialized prepared media and reagents	TB case detection and as prerequisite to drug-susceptibility testing	Referral laboratory	Good sensitivity	Slow time to growth
Chest radiograph	NA	TB case detection (pulmonary TB)	Referral	Indications and use not restricted to TB	Low specificity; low sensitivity; requires equipment, trained interpreter
Tuberculin skin test	Many commercialized reagents	Detection of *M. tuberculosis* infection	Community	Extensive practical and published experience	Sensitivity decreases with increasing immunocompromise; cross-reaction with BCG vaccine
Interferon-γ release assays	QuantiFERON-TB Gold (Cellestis); T-SPOT.TB (Oxford Immunotec)	Detection of *M. tuberculosis* infection	Referral to rference laboratory	Highly specific for *M. tuberculosis*	Requires moderate training and equipment; imperfect sensitivity, especially for immunocompromised persons
Trial of antibiotics directed against routine bacterial pneumonia pathogens	NA	TB case detection for persons with suspected pulmonary TB whose sputum smear results are negative	Community	May be clinically beneficial to patients with bacterial pneumonia	Poor discriminatory power; engenders time delay in further evaluation and care for patients with TB
Automated, nonintegrated NAAT	Amplified *Mycobacterium tuberculosis* direct test (Gen-Probe); Amplicor *M. tuberculosis* test (Roche)	TB case detection (pulmonary TB)	Reference laboratory	Sensitivity between that of smear and culture; highly specific for TB	Requires moderate training and equipment; labor intensive; potential for cross-contamination among specimens
Endorsed by the WHO					
Culture in liquid media	MGIT (Becton Dickinson); BacT/ALERT (BioMérieux); others	TB case detection and as prerequisite to drug-susceptibility testing	Referral laboratory	High sensitivity (higher than culture on solid media)	Slow time to detection (although faster than culture on solid media); high contamination rates in some settings
Strip-based species identification (detects TB-specific antigen in positive cultures)	Capilia TB (Tauns)	Species identification (TB versus not TB) in cultures positive for mycobacterial growth	Referral laboratory (with culture)	Accurate; requires minimal training; minimal equipment; minimal consumables	…
Line probe manual amplification and hybridization	Genotype MTBDRplus (Hain Lifescience); INNO-LiPA Mycobacteria (Innogenetics)	TB case detection and drug-susceptibility testing	Reference laboratory	Poor sensitivity in smear-negative specimens; relatively short time to result	Labor intensive; potential for cross-contamination; requires extensive training

NOTE. Adapted from [11, 12]. BCG, bacille Calmette-Guérin; ELISA, enzyme-linked immunosorbence assay; LAMP, loop-mediated isothermal amplification; LED, light emitting diode; MODS, microscopic observation drug susceptibility; NA, not applicable; NAAT, nucleic acid amplification test.

- **Tests may include:**
- **Biopsy of the affected** tissue (rare)
- Bronchoscopy
- Chest CT scan
- Chest x-ray
- Interferon-gamma blood test such as the QFT-Gold test to test for TB infection
- Sputum examination and cultures
- Thoracentesis
- Tuberculin skin test





CDC classification of tuberculin reaction

An induration (palpable raised hardened area of skin) of more than 5–15 mm (depending upon the person's risk factors) to 10 Mantoux units is considered a positive result, indicating TB infection.

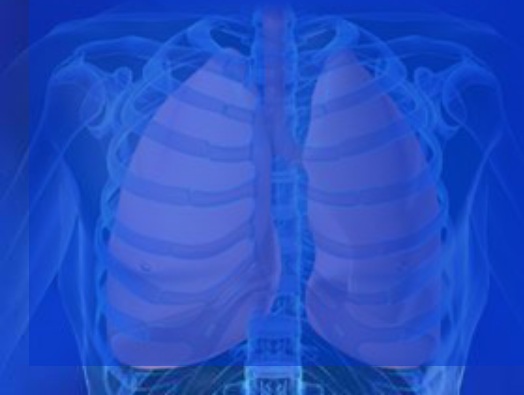
- 5 mm or more is positive in
  - HIV-positive person
  - Recent contacts of TB case
  - Persons with nodular or fibrotic changes on CXR consistent with old healed TB
  - Patients with organ transplants and other immunosuppressed patients

- 10 mm or more is positive in
  - Recent arrivals (less than 5 years) from high-prevalent countries
  - Injection drug users
  - Residents and employees of high-risk congregate settings (e.g., prisons, nursing homes, hospitals, homeless shelters, etc.)
  - Mycobacteriology lab personnel
  - Persons with clinical conditions that place them at high risk (e.g., diabetes, prolonged corticosteroid therapy, leukemia, end-stage renal disease, chronic malabsorption syndromes, low body weight, etc.)
  - Children less than 4 years of age, or children and adolescents exposed to adults in high-risk categories

- 15 mm or more is positive in
  - Persons with no known risk factors for TB
  - (Note: Targeted skin testing programs should only be conducted among high-risk groups)
- A tuberculin test conversion is defined as an increase of 10 mm or more within a 2-year period, regardless of age.

Expectations (prognosis)

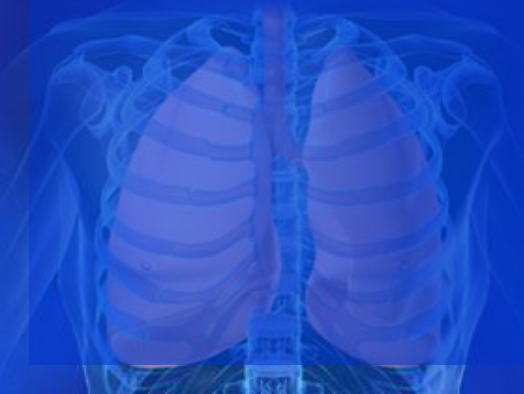
- Symptoms often improve in 2 - 3 weeks. A chest x-ray will not show this improvement until later. The outlook is excellent if pulmonary TB is diagnosed early and treatment is begun quickly.



Complications

- Pulmonary TB can cause permanent lung damage if not treated early.
- Medicines used to treat TB may cause side effects, including liver problems. Other side effects include:
- Changes in vision
- Orange- or brown-colored tears and urine
- Rash
- A vision test may be done before treatment so your doctor can monitor any changes in your eyes' health over time

- **Prevention**
- TB is a preventable disease, even in those who have been exposed to an infected person. Skin testing (PPD) for TB is used in high risk populations or in people who may have been exposed to TB, such as health care workers.
- A positive skin test indicates TB exposure and an inactive infection. Discuss preventive therapy with your doctor. People who have been exposed to TB should be skin tested immediately and have a follow-up test at a later date, if the first test is negative.
- Prompt treatment is extremely important in controlling the spread of TB from those who have active TB disease to those who have never been infected with TB.
- Some countries with a high incidence of TB give people a BCG vaccination to prevent TB. However, the effectiveness of this vaccine is controversial and it is not



Sarcoidosis

- Systemic granulomatous disease that primarily affects the lungs and the lymphatic system but can also affect mucocutaneous surfaces, the eyes, and the salivary glands