INFO
### RESPIRATORY SYSTEM - Main Pathologies

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<tr>
<td><strong>Acute Laryngitis</strong>&lt;sup&gt;(1,2)&lt;/sup&gt;</td>
<td>The commonest symptoms are hoarseness of voice (dysphonia), dry cough and pain in the throat. Children with acute epiglottitis present with fever and general malaise. Child may prefer to remain seated as the position makes breathing (airflow) easier. Odynophagia (pain during swallowing) may also be seen in some patients. Subglottic laryngitis is the larynx viral inflammation under the glottis.</td>
<td>Diagnosis is based on clinical examination. Sputum culture may help in identification of the causative agent. Sometimes, an indirect laryngoscopy is necessary, although it is normally contraindicated in acute epiglottitis.</td>
<td>▪ The conventional treatment consists of avoiding the use of irritating substances, resting the voice, and administration of anti-inflammatory agents.</td>
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<td><strong>Acute Respiratory Distress Syndrome</strong>&lt;sup&gt;(4)&lt;/sup&gt;</td>
<td>The most frequent symptoms are tachypnea (increase of respiratory frequency) and dyspnea associated with symptoms related to the underlying cause.</td>
<td>It is defined by the clinical picture, the thorax x-ray and the gas analysis (oxygen and carbon dioxide) in the peripheral blood, which shows mainly an important decrease of the partial pressure of oxygen in the blood (hypoxemia).</td>
<td>▪ The key treatment is corticoids.</td>
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<td><strong>Allergic Bronchopulmonary Aspergillosis</strong>&lt;sup&gt;(4,5)&lt;/sup&gt;</td>
<td>The majority of patients present with low-grade fever, wheezing and bronchial hyper-reactivity (mimics asthma), hemoptysis, or productive cough. Expectoration of brownish black mucus plugs is characteristic. On the thorax x-ray, there are transitory and recurring infiltrates that look like pneumonias or atelectasis.</td>
<td>It is based on clinical and laboratorial criteria (Rosenberg-Patterson criteria): asthma, increase in the number of eosinophils and IgE levels in the blood, presence of specific (IgE and IgG) anti-Aspergillus antibodies, skin hypersensitivity tests and history of pulmonary transitory infiltrates in the thorax x-ray.</td>
<td>▪ There is no known effective treatment.</td>
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| **Asbestosis**<sup>(6,7)</sup> | It arises after prolonged exposure to asbestos. The most common symptoms are an insidious onset of dyspnea, cough and production of sputum. Patients have a greater risk of lung and pleural cancer. | It is based on the clinical findings and the history of exposure. Examination shows findings of interstitial fibrosis (end-inspiratory crackles). Chest x-ray shows reticulo-linear opacities, mainly in the lower zones. Pleural fibrosis may be seen on CT. Pulmonary function tests show a predominantly restrictive pattern. Occasionally, fiber optic bronchoscopy and bronchoalveolar lavage may demonstrate asbestos fibers. | ▪ There is no known effective treatment. | ▪ The patients should be followed periodically due to the greater risk of lung and pleural cancer. | |!

![Asbestosis](image)

**Lung**

- **Fiber**
- **Bronchi**
- **Alveoli**
- **Scar**
- **Pleural lining**
### Asthma (8-9)

Chronic inflammatory disease of the airways, characterised by reversible limitation of the air flow and recurring episodes of bronchial spasm. An inflammatory mechanism, with predominant involvement of mast cells and immunoglobulin E, together with an alteration of the neural control of the airways (sympathetic and parasympathetic play an important role in the pathogenesis). There is an exaggerated bronchial response to multiple stimuli (bronchial hyper-reactivity), that precedes and predicts the development of asthma. Etiological and triggering factors include genetic predisposition, allergens (acarus, pets’ epithelium – cats and dogs, pollens and fungi), physical exercise, irritating gases, viral infections and drugs like acetylsalicylic acid and other non-steroid anti-inflammatory agents.

### Atelectasis (10, 11)

Collapse of a peripheral, segment or lobar region of the lung or of the entire lung, caused by an airway obstruction. It is not a pathology in itself, but is the consequence of a pulmonary or bronchial disorder, such as intraluminal bronchial obstruction (foreign body, mucus plugs, mass lesions) or extraluminal obstruction (pneumothorax, pleural effusion). After a bronchial obstruction, blood absorbs the peripheral alveolar gas and the consequent lung retraction causes the alveolar air content to disappear after a few hours. Atelectasis results in development of a left to right shunt, with attendant hypoxemia.

### Bronchiectasis (12, 13)

It is a chronic pulmonary condition characterized by persistent cough, excessive sputum production and recurrent chest infections. There is an abnormal and irreversible bronchial dilatation in one or more lobes, secondary to the destruction of the elastic and muscular components of the bronchial wall. It is associated with impairment of mucociliary clearance, leading to bacterial colonization and infection. Most causes are post-infective (pneumonia, tuberculosis); other etiologies include immune defects, connective tissue disorders, allergic bronchopulmonary aspergillosis, cystic fibrosis, obstruction or foreign body aspiration or inhalation and asthma.

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<td>Asthma</td>
<td>Typical symptoms are: dyspnea (shortness of breath), wheezing (with a characteristic sound, like a whistle, made by the air passing through the narrowed airways) and cough. A temporal relationship between the appearance of the symptoms and the inciting factor is usually apparent.</td>
<td>Wheeze is a distinctive, if non-specific, finding in the physical exam. Diagnosis is confirmed by spirometry; reversibility of obstruction of the air flow, after administration of a bronchodilator, is characteristic.</td>
<td>The mainstay of treatment is administration of bronchodilators (beta blockers) and anti-inflammatory agents (corticosteroids, leukotriene inhibitors, mast cell stabilizers). Acute episodes are managed with inhaled bronchodilators and injectable/inhaled steroids. Severe episodes require hospitalization. Other agents that are used in the treatment of chronic asthma include: disodium cromoglycate, nedocromil and theophyllines.</td>
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<tr>
<td>Atelectasis</td>
<td>Symptoms depend on the etiology, speed of development and the extent of the atelectasis. An acute bronchial occlusion with massive collapse causes pain in the affected side, dyspnea and tachycardia. There may be a concomitant pulmonary infection, usually with fever. Atelectasis that develops slowly may be completely asymptomatic or else causing only mild symptoms.</td>
<td>The diagnosis is suspected on the basis of signs and the clinical setting. Radiology confirms the diagnosis: Chest x-ray shows homogeneous parenchymal density (segment, lobar or pulmonary), decrease of the volume of the affected hemithorax and displacement of neighboring structures (heart, mediastinum and diaphragm, etc.) to the affected side. It is important to look for the cause of atelectasis. This may require thoracic axial computerized tomography (CT) and fiber optic bronchoscopy/biopsy.</td>
<td>The treatment depends on the etiology of the atelectasis. Treatment is based on repositioning and suctioning of respiratory secretions, percussion therapy, incentive spirometry, or intermittent positive pressure ventilation. In some cases, bronchoscopic suctioning and fiberoptic bronchoscopy for extraction of foreign body or mucus plug may be necessary.</td>
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<td>Bronchiectasis</td>
<td>The most frequent complications are massive hemoptysis, recurrent pneumonia (affecting the parenchyma around the affected bronchus), empyema and lung abscess, respiratory failure and cor pulmonale.</td>
<td>Chest x-ray may give characteristic images, however, it is non-specific. Diagnosis is confirmed by high resolution axial computerized tomography (HRCT) of the chest.</td>
<td>Treatment is targeted at elimination of the bronchial obstruction, improving clearance of secretions (physiotherapy and postural draining) and treating the respiratory infections. According to the etiology and severity, bronchodilators and oxygen therapy may be necessary. Steroids are not recommended unless there is concomitant asthma or COPD. All patients must receive annual influenza and 5-yearly pneumococcal vaccination.</td>
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<td><strong>Bronchiolitis</strong>&lt;sup&gt;(14,15)&lt;/sup&gt;</td>
<td>Symptoms are non-specific and include cough and shortness of breath (dyspnea).</td>
<td>The chest x-ray may show hyperinflation; HRCT shows a mosaic pattern and may show fibrosis in late stages. Biopsy is required for classification and definitive diagnosis.</td>
<td>Treatment is symptomatic; corticosteroids, bronchodilators and oxygen are utilized. Occasionally other immune-suppressants may be required (cyclosporine).</td>
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<td><strong>Chronic Obstructive Pulmonary Disease (COPD)</strong>&lt;sup&gt;(16,17)&lt;/sup&gt;</td>
<td>Symptoms appear around middle age, in individuals who have a history of smoking for several years. Typically, patients present with chronic cough, which may be productive (mucopurulent sputum), and shortness of breath (dyspnea). Exacerbations are caused by respiratory infections. In advanced conditions, dyspnea is observed at rest or upon minimal effort. Symptoms and signs of right heart failure may appear (ankle swelling, bluish color of the skin – cyanosis, and hepatomegaly).</td>
<td>Diagnosis is suspected on the basis of clinical presentation. Chest x-ray shows emphysematous changes (hyperinflated lung fields, depressed diaphragm) or non-specific changes. In severe stage, right heart enlargement may be seen. Diagnosis is confirmed by the demonstrating a non-reversible obstruction of the airflow, on spirometry.</td>
<td>Smoking must be discontinued and exposure to other etiological agents should be minimized. Exercise is advised for all patients, as per clinical condition. Pharmacological treatment consists of bronchodilators; inhaled steroids are recommended for exacerbations. In the causes of exacerbation by respiratory infection, antibiotics may be useful. Anti-flu and anti-pneumococcal vaccines are necessary. In patients with severe disease, oxygen is recommended for several hours a day.</td>
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<td><strong>Chylothorax</strong>&lt;sup&gt;(18)&lt;/sup&gt;</td>
<td>Symptoms are similar to other pleural effusions. Large collections of lymphatic fluid are also associated with symptoms of malnutrition due to loss of proteins and long chain fatty acids.</td>
<td>Pleural tap shows a milky fluid, which doesn’t become clear after centrifugation. Diagnosis is confirmed by demonstrating triglycerides &gt; 110 mg/dl or by the presence of chylomicrons in the pleural fluid.</td>
<td>If the cause is traumatic, pleural fluid is drained; surgical ligation of the thoracic duct may be required. Supplementation of diet with middle chain fatty acids (parenteral feeding or oral feeding) may be needed. If it is secondary to neoplasia, chemotherapy or radiotherapy may be effective. Corticosteroids and other immune-suppressants are used in carefully selected patients. Pulmonary transplant may be indicated in severe cases. Supportive measures, like supplemental oxygen, are used as indicated.</td>
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<td><strong>Idiopathic Pulmonary Fibrosis</strong>&lt;sup&gt;(19,20,21)&lt;/sup&gt;</td>
<td>It is most frequently observed in patients between the ages of 50 and 70. The initial symptoms are non-productive cough and dyspnea on exertion. Pulmonary auscultation reveals early inspiratory crackles.</td>
<td>Chest x-ray shows bilateral reticular markings that are dominant in the lower zones. HRCT chest shows subpleural honeycombing (palisades of small, round translucencies), traction bronchiectasis and thickened interlobular septae. Biopsy is the gold standard; BAL fluid analysis, and biopsy may be required to exclude other diagnosis.</td>
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### Lung Cancer (24, 25, 26, 27)
It is the most common cause of cancer related deaths, worldwide. The commonest types are: small cell carcinoma, adenocarcinoma, squamous cell carcinoma and large cell carcinoma. Tobacco smoking is thought to be responsible for the majority of cases of lung cancer; the strongest association is with the squamous cell and small cell types. Among non-smokers, the most frequent is adenocarcinoma. Five year survival after diagnosis is under 50% in case of localized disease, and under 25% if it is disseminated.

### Nasal Polyp (28, 29)
Benign lesion arising from the nasal mucosa. It is related to an inflammatory or an allergic process. Nasal polyps are mostly bilateral. Samter's Triad consists of nasal polyposis, asthma, and aspirin hypersensitivity.

### Obstructive Sleep Apnea (30)
It is a sleep disorder characterized by occurrence of apnea or hypopnea, repeatedly during sleep, leading to disruption of the sleep architecture. Apneas are characterized by the cessation of airflow for more than 10 s; hypopnea (in adults) is characterized by a reduction in nasal pressure by at least 50% of baseline for a duration of at least 10 s, accompanied by oxygen desaturation ≥ 4%. It is commonest in middle aged, obese men. In most cases, there is a functional impairment of the upper airway dilator muscle. Sleep fragmentation and chronic sleep deprivation lead to excessive daytime sleepiness.

### diagnosis
Diagnosis is suspected on the basis of symptoms. Lung cancer is usually confirmed by a positive bronchoscopy and, rarely, transthoracic needle biopsy.

### Treatment
- Treatment is based on the stage of the disease, specific type of cancer cells, location in the lungs, metastatic spread and the general health of the patient.
- Various modalities are used including surgery, radiotherapy and chemotherapy.
- The basis for the treatment of small cells cancer is chemotherapy.
- In small cell cancer, the first line of treatment is chemotherapy, while surgery is recommended for non-small cell cancers.

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**Normal breathing during sleep**

**Obstructive Sleep Apnea**

![Diagram of normal breathing during sleep](https://via.placeholder.com/150)

![Diagram of obstructive sleep apnea](https://via.placeholder.com/150)
### Pleural Effusion\(^{31,32}\)
An abnormal accumulation of fluid in the pleural space. It may be:
- **Transudate**: When it is produced by an increase in osmotic gradient across the pleural capillaries, e.g., by a decrease in plasma oncotic pressure.
- **Exudate**: When it is produced by an increase in the permeability of the capillary or by a decrease in the lymphatic drainage.

The most frequent causes of transudative effusion are: cardiac insufficiency, cirrhosis, nephrotic syndrome and rarely, myxedema. Exudative effusion usually appears in the context of pleuropulmonary infections, cancer, pulmonary thromboembolism, pancreatitis, collagen diseases, etc.

Purulent pleural collection, with high leukocyte content or presence of microbes is termed empyema.

### Pneumonia\(^{33,34}\)
An infectious process of the pulmonary parenchyma. Microorganisms invade the lung via aspiration of colonizers from the oropharynx, via blood from a non-pulmonary focus, or by contiguous spread from a neighboring structure. A failure in the defense mechanisms (ciliary movement, mucus secretion, immune response, etc.) or a very high load of microorganisms predispose to infection.

In adults, the commonest etiological agents are Streptococcus pneumoniae, Staphylococcus aureus, Legionella and Haemophilus influenzae and variousviruses. Mycoplasma pneumoniae is a frequent cause of pneumonia in older children and young adults. Alcohol consumption, smoking, diabetes, cardiac insufficiency and COPD are predisposing factors. Children, the elderly and individuals with alterations in the immune system are more prone to develop pneumonia.

Pneumonia is classified as community acquired (CAP); develops within or after 72 hours of hospital discharge, or nosocomial (occurs in patients hospitalized due to other pathology).

### Pneumonitis by Hypersensitivity\(^{35,36}\)
An immunologically mediated group of conditions which follow repeated exposure to different antigens. Usually, it is seen as an occupational disease in cattle breeders, farmers, wood workers, pigeon breeders, etc. Exposure to the antigen (fungi, bacteria, animal or plants products) causes an exaggerated inflammatory response, which, when chronic, evolves to pulmonary fibrosis.

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| Pleural Effusion\(^{31,32}\) | Small effusions are asymptomatic. The common symptoms include a pleuritic chest pain, dyspnea and dry nonproductive cough. Symptoms of underlying etiologies will be apparent, e.g., fever in patients with an infectious disease. | Chest x-ray and the ultrasound are useful for determining the location and volume of the effusion. Thoracocentesis (pleural tap) and examination of the pleural fluid is necessary to ascertain the etiology. In some cases a thoracoscopic pleural biopsy may be necessary. | - The primary cause should be treated.  
- Large fluid collections and empyemas require placement of a pleural drain. In cases where there is loculation of fluid, intra-pleural instillation of fibrinolitics (through the draining tube) may be done to facilitate the exit of pus. Another procedure is the deseroification, which implies a thoracotomy with complete removal of existing pus.  
- Pleurodesis consists of applying an irritant (talc, tetracycline, bleomycin) between the two pleural layers (parietal and visceral) aiming to cause an inflammatory reaction that results in the fusion of both layers. It is used in the symptomatic treatment of recurrent significant effusions of a malignant etiology. |
| Pneumonia\(^{33,34}\) | The typical presentation consists of an acute fever, chills, productive cough and pleuritic chest pain, with high leukocyte count in the peripheral blood. Atypical pneumonia presents subacutely with fever, headache, myalgia (muscle pain), arthritis (joint pain) and dry cough. The nosocomial pneumonias may be masked by the underlying disease; it must be suspected in patients with fever and new radiological infiltrates. | Diagnosis is based on clinical history, examination and radiological investigations. The etiological diagnosis can only be confirmed by sputum’s exam, blood culture and bronchofibroscopy. In general, invasive procedures are not used regularly, since in a high percentage of CAP the responsible microorganisms are common and treatment is empirical. | - It is based on antibiotics and supportive measures.  
- The choice of the antibiotic depends on the type of pneumonia (CAP or nosocomial), the type of presentation (typical or atypical), the presence of risk factors for unusual microorganisms (elderly, COPD, severe types of presentation). Antimicrobial choice may be modified by culture and sensitivity reports.  
- Patients with severe disease require hospitalization and may need aggressive support measures including invasive ventilation. |
| Pneumonitis by Hypersensitivity\(^{35,36}\) | May occur in an acute, subacute or chronic form. In the acute type, patient presents with fever, chills, dyspnea, cough and myalgia, which disappear a few days after the exposure is discontinued. Tachypnea, tachycardia, and bibasilar inspiratory crackles are usually present. The chronic type is secondary to prolonged exposure, and presents with cough, dyspnea, weight loss; there may be symptoms of pulmonary hypertension. | It is based on high index of suspicion. Physical examination shows non-specific findings; chest x-ray shows ground glass opacities in acute cases and increased reticular shadows/honeycombing in the chronic cases. Bronchoscopy and bronchoalveolar lavage is also useful. | - Identifying and eliminating the causal agent is fundamental.  
- Milder cases usually resolve on their own following discontinuation of exposure.  
- Severe ones require treatment with corticosteroids. |
**Pneumothorax**

Air or gas accumulation in the pleural cavity. It may be: traumatic (open or closed trauma); spontaneous, in thin, young males (rupture of apical bubbles) or in patients with COPD; hypertensive, when by a valvular mechanism, air penetrates in the pleural space during inspiration and it is retained during expiration; catamenial, in young women, related to menstruation. A tension pneumothorax is a medical emergency due to rising intrathoracic pressure from progressive air accumulation in the pleural cavity.

**Symptoms**

The clinical presentation depends on the patient's ventilatory reserve and the degree of lung collapse. Common symptoms include back pain, dyspnea, dry cough, sweating, tachycardia and pallor. In patients with tension pneumothorax, cyanosis and shock are common.

**Diagnosis**

It is confirmed by a chest x-ray. For visualizing small pneumothorax (< 15% area of hemithorax), CT scan may be required.

**Treatment**

- Therapeutic options include bed rest, oxygen supplementation, manual aspiration, chest tube drainage and thoracoscopic and surgical interventions. Small spontaneous pneumothoraces without ventilatory compromise require only rest and observation.
- Those associated with respiratory compromise require thoracic drainage.
- To avoid relapses, surgical treatment (by resection of bullae) is helpful in selected patients only.
- Tension Pneumothorax is considered an emergency that requires immediate administration of oxygen and insertion a high caliber needle in the 2nd intercostal space. The air exit confirms the diagnosis and should remain open until a permanent draining tube is placed.

**Pulmonary Hypertension**

Condition characterized by elevated pulmonary arterial pressure (pulmonary artery pressure > 25 mmHg during rest or over 30 mmHg during exercise) and secondary right ventricular failure. Primary pulmonary hypertension is not very frequent and its cause is unknown. Secondary pulmonary hypertension is more frequent and is often the consequence of chronic respiratory or cardiovascular diseases which are associated with low oxygen level in the blood (hypoxemia). The most frequent cause is COPD. Other causes for secondary pulmonary hypertension are: congenital heart diseases, portal hypertension, human immunodeficiency virus (HIV) infection, drugs, chronic exposure to great heights, etc. Hypoxemia induces the constriction of pulmonary vessels (to maintain the gas-exchange equilibrium), which lead to change in the vascular wall and thrombosis. **Cor pulmonale** is the increase in size of the right ventricle secondary to chronic pulmonary hypertension.

**Symptoms**

In primary pulmonary hypertension, the most frequent symptom is progressive dyspnea, which may occur after several years of onset of disease. Fatigue, weakness, as well as thoracic pain, are also observed; syncope and hemoptysis may occur. In secondary pulmonary hypertension, the symptoms overlap with those of the primary disease process.

**Diagnosis**

Physical examination shows signs of right ventricular insufficiency (engorged jugular veins; hepatomegaly, peripheral edema). Electrocardiographic features of right ventricular and atrial enlargement are seen. Cardiac catheterization is useful to directly measure the pulmonary artery pressure, as well as to rule out other secondary causes.

**Treatment**

- Primary pulmonary hypertension is a progressive disease for which there is no cure.
- Oxygen supplementation is essential for all patients with arterial hypoxemia.
- Pulmonary transplantation is prescribed for patients with severe right cardiac insufficiency, who do not respond to treatment.
- Vasodilators, which act on pulmonary circulation, diuretics to reduce fluid retention, and anticoagulants are used. Medications include calcium channel blockers, prostanoids, endothelin receptor antagonists and phosphodiesterase type-5 inhibitors.
- Surgical thrombo-endarterectomy is the primary surgical therapy for selected patients with thromboembolic obstruction of the proximal pulmonary arteries.
- Pulmonary transplant is prescribed for patients with severe right cardiac insufficiency, who do not respond to treatment.
**Pulmonary Thromboembolism (PTE)**\(^{39,40}\)

Pulmonary vessel obstruction by one or several emboli. Emboli, in most cases, are fragments of thrombi (clots), which travel through the blood until they obstruct a smaller caliber vessel. The most common source of emboli is thrombosed lower limbs veins or those of the pelvis (deep venous thrombosis). Emboli of fat, amniotic fluid, bone marrow or tumor fragments may also lodge in the pulmonary vasculature. The risk factors for venous thrombosis and pulmonary thromboembolism are: prolonged immobilization, pregnancy, recently diagnosed cancer, oral contraceptives and states of hypercoagulability. When the pulmonary blood flow is acutely interrupted, it creates a shunt (left to right) and leads to hypoxemia. Obstruction of large vessel or obstruction of multiple smaller vessels leads to strain on the right heart and increase in pressures.

**Rhinitis**\(^{41,42}\)

Inflammation of the mucus membrane that covers the nasal pits. It is defined as the presence of at least one of the following: congestion, rhinorrhea, sneezing, nasal itching, and nasal obstruction. It may be due to viral infections (corona), allergy, parasympathetic hyper-functioning (vasomotor rhinitis), associated with pregnancy, dry environment and contamination.

**Sarcoidosis**\(^{43}\)

Multisystem granulomatous disease of unknown cause, characterized by the formation of noncaseous epithelioid cell granulomas. It involves the respiratory system in > 90% of cases, usually the hilar and mediastinal nodes, and, less frequently, the lung tissue. There is an exaggerated response of the cellular immunity leading to formation of granulomas. The inflammation and coalescence of granulomas alters pulmonary architecture, causes fibrosis, cyst formation, bronchiolitis and bronchiectasis.

**Systemic Involvement in Sarcoidosis**

- **Brain complications** (tremor, headache, seizures, learning disabilities, memory impairment, and strokes)
- **Eye problems** (burning, itching, tearing or pain)
- **Salivary glands** swelling
- **Lupus pernio** (painful skin lesions on the face) and skin lesions on back, arms, neck, face and scalp
- **Enlarged lymph nodes** in neck and chest
- **Heart complications**
  - **Granulomas** (inflamed lumps) in lungs
  - **Liver enlargement**
  - **Spleen enlargement**
- **Erthema nodosum** (itchy painful rashes) on the lower legs and ankles
- **Scarring and granulomas in lung**

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<td>Rhinitis</td>
<td>Common symptoms are rhinorrhea (watery nasal discharge) and decrease in sense of smell; these may be associated with other flu-like symptoms. Allergic rhinitis may be due to a large variety of allergens and presents with repetitive sneezing, rhinorrhea, nasal obstruction and nasal or ocular itching. Vasomotor rhinitis is triggered by temperature change, irritative agents, hyperthyroidism and oral contraceptives. Repeated episode of acute rhinitis can lead to a hypertrophic chronic rhinitis, with increase in the size of the inferior turbinate. Dry rhinitis presents as lesions with crusting and signs of bleeding. Ozena is a type of atrophic rhinitis that presents with smelly crusts and anosmia (absence of sense of smell).</td>
<td>The diagnosis is suspected on the basis of symptoms in the context of the clinical setting (presence of risk factors). Pulmonary perfusion scintigraphy allows visualization of pulmonary areas with reduced blood flow. It is performed in conjunction with pulmonary ventilation scintigraphy (V/Q scan to look for mismatch, which is diagnostic). CT scan, contrast spiral CT and determination of D-dimers in blood may be useful. D-dimer has a good negative-predictive value, especially in setting of low clinical suspicion. The gold standard for diagnosis is pulmonary angiography.</td>
<td>- The treatment of suspected PTE is anticoagulation with heparin. Either regular or low molecular weight heparin may be used. - In acute cases with significant hemodynamic compromise, and in patients in whom &gt; 50% of pulmonary perfusion is compromised, it is recommended to start treatment with intravenous fibrinolytics. - After the acute period, treatment with oral anticoagulants should be continued for 3 to 6 months. - In patients with recurring embolism or irreversible risk factors, life-long treatment with anticoagulants may be required. - In cases where anticoagulation is contraindicated, inferior vena cava filters or embolectomy may be necessary.</td>
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<td>Pulmonary Thromboembolism (PTE)</td>
<td>Dyspnea (a sensation of shortness of breath) and tachypnea (increase of respiratory frequency) of sudden onset are frequent. Acute embolism may present with dizziness, fainting, palpitations and even syncope. The presence of cyanosis (bluish color of the skin), or syncope (sudden loss of consciousness) indicate massive embolism. In a large proportion of cases, signs of deep venous thrombosis of the leg(s) are evident. Pulmonary hypertension, if severe, is followed by acute respiratory insufficiency, right ventricular insufficiency and even death.</td>
<td>Usually, a detailed history and clinical exam is enough. Rhinoscopy for visualization of the nasal cavity and the turbinites is performed.</td>
<td>- The following medications are commonly utilized: decongestants, anti-inflammatory and anti-pyretics. - In allergic rhinitis, besides avoiding contact with the allergen, decongestants (antihistamines) and topical corticosteroids are useful. - Vasomotor rhinitis may require vidian nerve neuroectomy or cryosurgery. - Inferior turbinate surgery may be indicated in hypertrophic chronic rhinitis. - Dry rhinitis requires abundant hydration.</td>
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<tr>
<td>Sarcoidosis</td>
<td>Pulmonary involvement is frequently asymptomatic or presents with dyspnea and dry cough. Enlargement of the thoracic lymph nodes is frequent. Nasal mucosal membranes may be involved. Laryngeal granulomas may cause dysphonia. Other affected organs are: skin (pernio lupus, erythema nodosum); eyes (uveitis, chorioiditis); liver, nervous system, bone marrow, spleen, nervous system, heart, endocrine system and reproductive organs.</td>
<td>Diagnosis is confirmed by histopathology, which shows granulomas in the tissue biopsy. However, biopsy may not be possible in many cases and diagnosis is suspected on the basis of the clinico-radiological picture. CT scans of chest are commonly utilized for diagnosis and staging of the disease. The most accessible areas for biopsy are the bronchial tree or the lung (transbronchial biopsy). Blood tests that help in diagnosis include raised serum ACE levels and hypercalcemia.</td>
<td>- A third of the cases may remit spontaneously after 1 to 2 years, one third show signs of progression and the rest remains stable. - In severe disease or in patients with significant extra-pulmonary involvement, treatment with corticosteroids and other immunosuppressants is recommended. - Airway disease is treated symptomatically; corticosteroids (oral/inhaled) are used for clinically significant disease.</td>
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### Sinusitis

Inflammation of the mucous membrane that covers the nasal sinuses. Usually, it is caused by the obstruction of a perinasal sinus, which makes draining difficult and favors super-infection. The obstruction may be favored by deviation of the septum, polyps, decreased immunity (diabetes) or reduction of the mucociliary activity (contamination). The bacterial agents most frequently implicated in acute sinusitis are the *Streptococcus pneumoniae*, *Hemophilus influenzae* and *Moraxella catarrhalis*. A majority of sinusitis, however, is attributable to a viral etiology. In chronic sinusitis, anaerobic agents are also important etiological agents. In children, the sinus most commonly affected is the ethmoid; in the adult, it is the maxillary sinus.

### Tonsilitis

Inflammation of the tonsils, usually of bacterial etiology (*streptococcus*, *staphylococcus*), although it may also be viral. The incidence is higher in pre-school age, though it affects the majority of the population sometime during their life.

### Vocal Cords Polyp

Benign mass that develops on the true vocal fold, mostly secondary to voice abuse or vocal trauma. It is unilateral and more common in males.

### Vocal Cords Nodule

Benign bilaterally symmetric swelling of the true vocal folds (anterior and mid-third of the folds). It is caused by chronic abuse of the voice. It is more frequent in women. It presents itself with dysphonia (hoarseness), episodic voice loss and vocal fatigue.

### Nasal Polyposis

Benign bilaterally symmetric swelling of the nasal mucosa. It can be observed in the chest x-ray; may be asymptomatic or present with cough and mild dyspnea; - to a severe disease - massive progressive pulmonary fibrosis, which appears when simple nodules converge, forming large masses of fibrotic tissue; presents with severe dyspnea and cough. Silica exposure is also associated with lung cancer, pulmonary tuberculosis and COPD.

### Silicosis

Pulmonary pathology caused by silica dust inhalation (e.g. in quartz quarry workers). Silica dust is the main element in sand; exposure is frequent among miners, silicaceous rock and granite cutters, foundry workers and potters. When inhaled, silica initiates an inflammatory reaction that leads to pulmonary tissue fibrosis. Silica exposure is classically associated with restrictive lung disease.

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<th>TREATMENT</th>
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<tbody>
<tr>
<td>Sinusitis</td>
<td>Usually, symptoms appear after 20 or 30 years of cumulative exposure to the dust. The severity of disease varies from simple or classic type - small lesions (silicotic nodule) that can be observed in the chest x-ray; may be asymptomatic or present with cough and mild dyspnea; - to a severe disease - massive progressive pulmonary fibrosis, which appears when simple nodules converge, forming large masses of fibrotic tissue; presents with severe dyspnea and cough. Silica exposure is also associated with lung cancer, pulmonary tuberculosis and COPD.</td>
<td>Diagnosis is based on establishing a history of exposure and correlating the same with clinical findings and radiological investigations (chest x-ray/ CT).</td>
<td>The exposure to dust at work should be minimized by measures such as wearing proper masks. It is necessary to perform regular control chest x-rays for the exposed workers. Once fibrosis sets in, the process is irreversible. Treatment is symptomatic, aimed at alleviation of dyspnea.</td>
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<tr>
<td>Tonsilitis</td>
<td>The patient presents with high fever, malaise, pain, difficulty in swallowing and ear pain (reflex otalgia). A frequent complication is the peritonsillar abscess, a collection of pus in the pretonsillar area, which leads to uvular displacement. Systemic complications may appear after a streptococcal infection (glomerulonephritis or rheumatic fever).</td>
<td>Examination of the throat shows erythema and congestion of the tonsils. There may be pus points or a thin white membrane over the tonsil. Collecting some pus or mucus from the posterior part of the throat with a swab allows isolation of the causative microorganism.</td>
<td>Bacterial tonsillitis requires treatment with antibiotics, painkillers and antipyretics. If there have been seven or more episodes of tonsillitis in a year, five or more in the last two years or three or more in the past three years, a surgical excision of the tonsils may be recommended.</td>
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<tr>
<td>Vocal Cords Polyp</td>
<td>Usually, patients present with chronic dysphonia and vocal fatigue.</td>
<td>Indirect laryngoscopy biopsy.</td>
<td>Surgical treatment with the excision of the polyp. Lasers may be used for treatment.</td>
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<tr>
<td>Vocal Cords Nodule</td>
<td>The treatment starts with voice therapy; if it doesn’t improve, microsurgical excision is performed. Other indications for microsurgical treatment are: longstanding nodule (failure of voice therapy) and suspicion of a primary lesion with a reactive callus on the other vocal fold.</td>
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### Different causes of Sinusitis

- **Deviation of nasal septum**
- **Nasal cleft (mucociliary clearance)**
- **Ostomeatal obstruction**
- **Mucociliary clearance of maxillary sinus**
- **Nasal septum**
- **Orbit**
- **Fluid collected in sinus**

### RESPIRATORY SYSTEM - RESPIRATORY PATHOLOGIES

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### Silicosis

Silica dust is the main element in sand; exposure is frequent among miners, silicaceous rock and granite cutters, foundry workers and potters. When inhaled, silica initiates an inflammatory reaction that leads to pulmonary tissue fibrosis. Silica exposure is classically associated with restrictive lung disease.

### Sinusitis

Inflammation of the mucous membrane that covers the nasal sinuses. Usually, it is caused by the obstruction of a perinasal sinus, which makes draining difficult and favors super-infection. The obstruction may be favored by deviation of the septum, polyps, decreased immunity (diabetes) or reduction of the mucociliary activity (contamination). The bacterial agents most frequently implicated in acute sinusitis are the *Streptococcus pneumoniae*, *Hemophilus influenzae* and *Moraxella catarrhalis*. A majority of sinusitis, however, is attributable to a viral etiology. In chronic sinusitis, anaerobic agents are also important etiological agents. In children, the sinus most commonly affected is the ethmoid; in the adult, it is the maxillary sinus.

### Tonsilitis

Inflammation of the tonsils, usually of bacterial etiology (*streptococcus*, *staphylococcus*), although it may also be viral. The incidence is higher in pre-school age, though it affects the majority of the population sometime during their life.

### Vocal Cords Polyp

This is a benign mass that develops on the true vocal fold, mostly secondary to voice abuse or vocal trauma. It is unilateral and more common in males.

### Vocal Cords Nodule

Benign bilaterally symmetric swelling of the true vocal folds (anterior and mid-third of the folds). It is caused by chronic abuse of the voice. It is more frequent in women. It presents itself with dysphonia (hoarseness), episodic voice loss and vocal fatigue.
INFO