



# DISEASES OF RESPIRATORY TRACT

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J6TO3 - PHARMACEUTICAL MARKETING

# RESPIRATORY DISEASES

- **Respiratory diseases, or lung diseases,** are pathological conditions affecting the organs and tissues that make gas exchange difficult in air-breathing animals.
- They include conditions of the respiratory tract including the trachea, bronchi, bronchioles, alveoli, pleurae, pleural cavity, the nerves and muscles of respiration.
- Respiratory diseases range from mild and self-limiting, such as the common cold, influenza, and pharyngitis to life-threatening diseases such as bacterial pneumonia, pulmonary embolism, tuberculosis, acute asthma, lung cancer, and severe acute respiratory syndromes, such as COVID-19.
- The study of respiratory disease is known as PULMONOLOGY.



# CHRONIC RESPIRATORY DISEASE

- ▶ Chronic respiratory diseases (CRDs) are long-term diseases of the airways and other structures of the lung.
- ▶ They are characterized by a high inflammatory cell recruitment (neutrophil) and/or destructive cycle of infection, (e.g. mediated by *Pseudomonas aeruginosa*). Some of the most common are asthma, chronic obstructive pulmonary disease, and acute respiratory distress syndrome.
- ▶ CRDs are not curable; however, various forms of treatment that help dilate major air passages and improve shortness of breath can help control symptoms and increase the quality of life.



COPD

# Respiratory tract Infection

- ▶ Infections can affect any part of the respiratory system. They are traditionally divided into upper respiratory tract infections and lower respiratory tract infections.
- ▶ **Upper respiratory tract infection**
- ▶ The most common upper respiratory tract infection is the common cold. However, infections of specific organs of the upper respiratory tract such as sinusitis, tonsillitis, otitis media, pharyngitis and laryngitis are also considered upper respiratory tract infections.

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## Lower respiratory tract infection

- The most common lower respiratory tract infection is pneumonia, an infection of the lungs which is usually caused by bacteria, particularly *Streptococcus pneumoniae* in Western countries. Worldwide, tuberculosis is an important cause of pneumonia. Other pathogens such as viruses and fungi can cause pneumonia for example severe acute respiratory syndrome, COVID-19 and pneumocystis pneumonia. Pneumonia may develop complications such as a lung abscess, a round cavity in the lung caused by the infection, or may spread to the pleural cavity.
- Poor oral care may be a contributing factor to lower respiratory disease. New research suggests bacteria from gum disease travel through airways and into the lungs

Upper respiratory tract

Nasal cavity

Pharynx

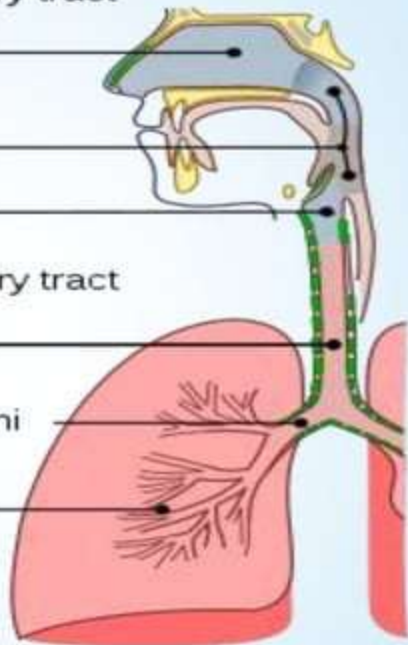
Larynx

Lower respiratory tract

Trachea

Primary bronchi

Lungs



# TUMORS

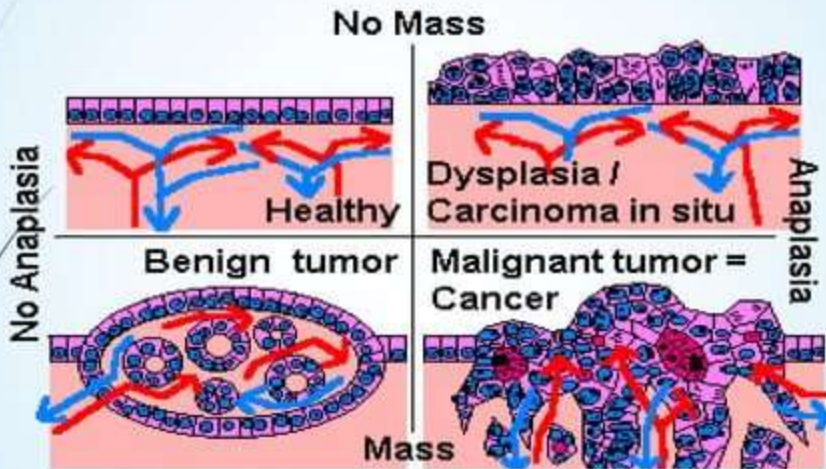
## ► Malignant tumor

- Malignant tumors of the respiratory system, particularly primary carcinomas of the lung, are a major health problem responsible for 15% of all cancer diagnoses and 30% of all cancer deaths. The majority of respiratory system cancers are attributable to smoking tobacco.
- The major histological types of respiratory system cancer are:
  - Small cell lung cancer



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- ▶ Non-small cell lung cancer
  - ▶ Adenocarcinoma of the lung
  - ▶ Squamous cell carcinoma of the lung
  - ▶ Large cell lung carcinoma
- ▶ Other lung cancers (carcinoid, Kaposi's sarcoma, melanoma)
- ▶ Lymphoma
- ▶ Head and neck cancer
- ▶ Pleural mesothelioma, almost always caused by exposure to asbestos dust.



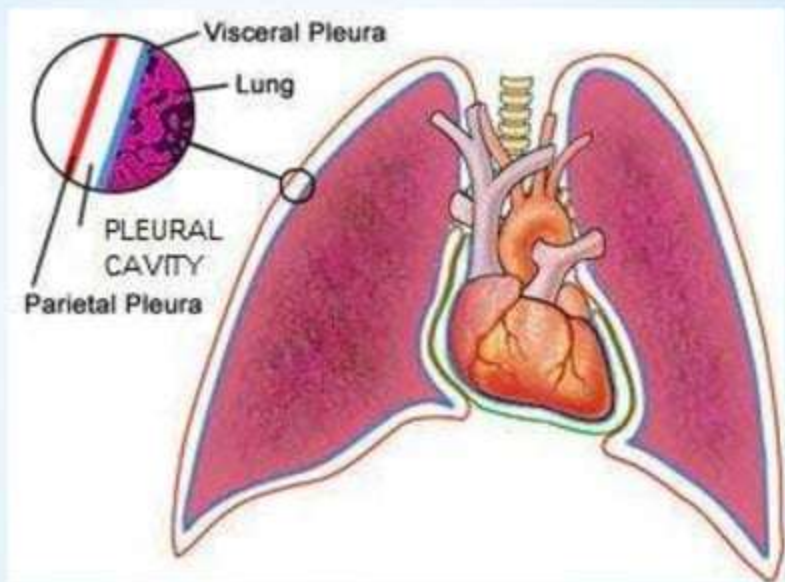
## Cont..


- **Benign tumors**

- ▶ Benign tumors are relatively rare causes of respiratory disease. Examples of benign tumors are:
  - ▶ Pulmonary hamartoma
  - ▶ Congenital malformations such as pulmonary sequestration and congenital cystic adenomatoid malformation (CCAM).

# Pleural cavity disease

- Pleural cavity diseases include pleural mesothelioma which are mentioned above.
- A collection of fluid in the pleural cavity is known as a pleural effusion. This may be due to fluid shifting from the bloodstream into the pleural cavity due to conditions such as congestive heart failure and cirrhosis. It may also be due to inflammation of the pleura itself as can occur with infection, pulmonary embolus, tuberculosis, mesothelioma and other conditions.
- A pneumothorax is a hole in the pleura covering the lung allowing air in the lung to escape into the pleural cavity. The affected lung "collapses" like a deflated balloon. A tension pneumothorax is a particularly severe form of this condition where the air in the pleural cavity cannot escape, so the pneumothorax keeps getting bigger until it compresses the heart and blood vessels, leading to a life-threatening situation.





# Pulmonary vascular disease

- ▶ Pulmonary vascular diseases are conditions that affect the pulmonary circulation. Examples are:
- ▶ Pulmonary embolism, a blood clot that forms in a vein, breaks free, travels through the heart and lodges in the lungs (thromboembolism). Large pulmonary emboli are fatal, causing sudden death. A number of other substances can also embolise (travel through the blood stream) to the lungs but they are much more rare: fat embolism (particularly after bony injury), amniotic fluid embolism (with complications of labour and delivery), air embolism (iatrogenic – caused by invasive medical procedures).



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- ▶ Pulmonary arterial hypertension, elevated pressure in the pulmonary arteries. Most commonly it is idiopathic (i.e. of unknown cause) but it can be due to the effects of another disease, particularly COPD. This can lead to strain on the right side of the heart, a condition known as cor pulmonale.
- ▶ Pulmonary edema, leakage of fluid from capillaries of the lung into the alveoli (or air spaces). It is usually due to congestive heart failure.
- ▶ Pulmonary hemorrhage, inflammation and damage to capillaries in the lung resulting in blood leaking into the alveoli. This may cause blood to be coughed up. Pulmonary hemorrhage can be due to auto-immune disorders such as granulomatosis with polyangiitis and Goodpasture's syndrome

### Lesions of PVOD

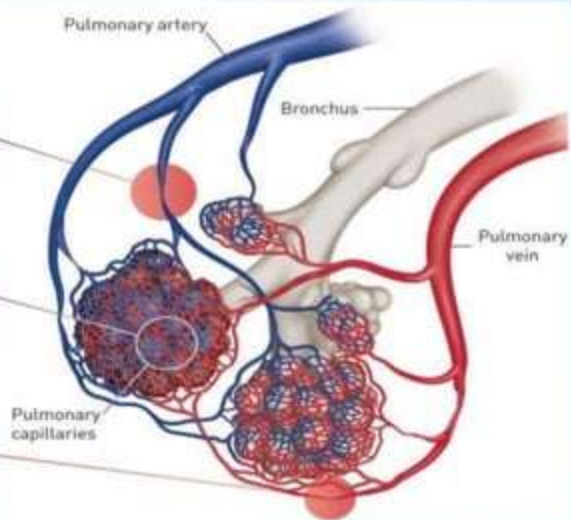
#### Pulmonary artery



#### Pulmonary capillaries



#### Pulmonary vein







# Neonatal disease

- ▶ Neonatal diseases
- ▶ Pulmonary diseases may also impact newborns, such as pulmonary hyperplasia, pulmonary interstitial emphysema (usually preterm births), and infant respiratory distress syndrome



# Diagnosis

- Respiratory diseases may be investigated by performing one or more of the following tests
- Biopsy of the lung or pleura
- Blood test
- Bronchoscopy
- Chest X-ray
- CT scan, including high-resolution computed tomography
- Culture of microorganisms from secretions such as sputum
- Ultrasound scanning can be useful to detect fluid such as pleural effusion
- Pulmonary function test
- Ventilation-perfusion scan

# Epidemiology

- Respiratory disease is a common and significant cause of illness and death around the world. In the US, approximately one billion common colds occur each year. A study found that in 2010, there were approximately 6.8 million emergency department visits for respiratory disorders in the U.S. for patients under the age of 18. In 2012, respiratory conditions were the most frequent reasons for hospital stays among children.
- In the UK, approximately 1 in 7 individuals are affected by some form of chronic lung disease, most commonly chronic obstructive pulmonary disease, which includes asthma, chronic bronchitis and emphysema. Respiratory diseases (including lung cancer) are responsible for over 10% of hospitalizations and over 16% of deaths in Canada.
- In 2011, respiratory disease with ventilator support accounted for 93.3% of ICU utilization in the United States.



THANK  
YOU