

RESPIRATORY SYSTEM

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ABSTRACT:

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The respiratory system is the system that supplies the body with oxygen and removes carbon dioxide. It includes the nose, pharynx, larynx, trachea, bronchi and lungs. Gas exchange takes place in the alveoli of the lungs: oxygen passes into the blood and carbon dioxide is released outside. This system is very important for the vital activity of the organism.

The respiratory system is one of the most vital systems in the human body. Its main function is to supply the blood with oxygen (O₂) and expel the carbon dioxide (CO₂) produced energy and the body would perish within minutes.

Structure of the Respiratory system: The respiratory system consists of two main parts: the upper respiratory tract, the lower respiratory tract and the lungs.

Upper respiratory tract:

Nasal cavity : air first passes through here. Nasal hairs and the mucous membrane trap dust, dirt and microorganisms. At the same time, the air is warmed and humidified.

Lower Respiratory tract:

Larynx: contains the vocal cords. As air passes through, the cords vibrate to produce sound. At the entrance of the larynx is the epiglottis, which protects the airway from food during swallowing.

Trachea: A tubular organ about 10-12 cm long. It is composed of C-shaped cartilage rings, which keep the trachea constantly open.

Bronchi: the trachea divides into two main bronchi, the right and left, which carry air to the respective lungs.

Bronchioles: the small branches of the bronchi. Their walls contain muscle fibers that regulate the passage of air.

Gas Exchange Organ:

Lungs: paired organs located in the thoracic cavity. The right lung has three lobes, while the left lung has two. The main functional unit of the lungs is the alveoli. These tiny sacs (numbering nearly 300 million) are surrounded by blood and carbon dioxide passes from the blood into the air.

Physiology of breathing. The breathing process consists of the following stages:

Inspiration: the diaphragm contracts and moves downward. The intercostal muscles contract, lifting the ribs up and outward. This increases the volume of the chest cavity, decreases pressure and air rushes into the lungs.

Expiration: the muscles relax, the diaphragm moves upward, the chest cavity narrows, pressure increases and air is pushed out of the lungs.

A healthy person at rest breathes 12-18 times per minute. During physical activity, this rate can increase to 30-40 times per minute.

Diseases of the respiratory system are very common and can be divided into acute (sudden onset, short duration) and chronic (long-lasting) types. Diseases of the upper respiratory tract:

Rhinitis (inflammation of the nasal mucosa) caused by a common cold or allergies, leading to nasal congestion and discharge.

Sinusitis (inflammation of the paranasal sinuses) characterized by headache and purulent nasal discharge.

Pharyngitis (inflammation of the pharynx) sore throat and difficulty swallowing.

Tonsillitis (inflammation of the tonsils- tonsillitis/angina) severe sore throat, fever and enlarged tonsils.

Diseases of the lower respiratory tract and Lungs.

Laryngitis (inflammation of the larynx) hoarseness, dry cough, especially dangerous in children (croup).

Tracheitis (inflammation of the trachea) severe, paroxysmal cough, worsening at night and in the morning.

Bronchitis (inflammation of the bronchi) can be acute or chronic. Characterized by cough and sputum production. Chronic bronchitis is mainly seen in smokers.

Pneumonia (inflammation of the lung tissue) inflammation of the alveoli. Characterized by high fever, severe cough, bloody sputum and chest pain. Requires hospital treatment.

Lung abscess (pus filled cavity in the lung) results from a severe bacterial infection. Symptoms include purulent sputum, high fever and sweating.

Pulmonary tuberculosis: caused by the bacterium *Mycobacterium tuberculosis*. Symptoms include prolonged cough, coughing up blood, weight loss and night sweats. It remains one of the most dangerous infectious diseases worldwide.

Chronic and allergic diseases:

Bronchial asthma: chronic inflammation of the airways. Manifests as attacks of suffocation, wheezing and a feeling of chest tightness. Triggers include dust, pollen, animal dander, cold air and strong odors.

Pulmonary fibrosis (scarring of lung tissue) the lungs lose their elasticity and gas exchange is impaired.

Pulmonary hypertension: increased blood pressure in the pulmonary artery, leading to strain on the right ventricle of the heart.

Lung Cancer: one of the most dangerous malignancies of the respiratory system. The main cause is smoking (including passive smoking). The disease is often asymptomatic in early stages. Later stages may present with bloody cough, chest pain and weight loss.

Prevention of diseases :

1. Quit smoking – the main preventive measure against lung cancer and other chronic diseases.

2. Vaccination- vaccination against flu, pneumonia (pneumococcus), tuberculosis (BCG) and COVID-19 .

3. Clean air- regularly ventilate rooms, perform damp dusting, reduce dust and allergens.

4. Physical activity- walking, running and swimming increase lung capacity.

5. Occupational safety: wear respirators when working with dust or chemicals.

The respiratory system protects the body from oxygen deprivation. However, this same system is often damaged by various infections, polluted air and smoking. Many respiratory diseases are preventable- this requires a healthy lifestyle, regular check-ups and timely consultation with a doctor.

References

1. Hall J.E. Guyton and Hall Textbook of Medical Physiology. 14th ed. Philadelphia: Elsevier; 2021. 1152 p.
2. Tortora G.J., Derrickson B. Principles of Anatomy and Physiology. 16th ed. Hoboken: Wiley; 2021. 1344 p.
3. Drake R.L., Vogl W., Mitchell A.W.M. Gray's Anatomy for Students. 5th ed. Philadelphia: Elsevier; 2023. 1232 p.
4. Moore K.L., Dalley A.F., Agur A.M.R. Clinically Oriented Anatomy. 9th ed. Philadelphia: Wolters Kluwer; 2022. 1168 p.
5. Mescher A.L. Junqueira's Basic Histology: Text and Atlas. 17th ed. New York: McGraw-Hill Education; 2021. 608 p.
6. Kumar V., Abbas A.K., Aster J.C. Robbins & Cotran Pathologic Basis of Disease. 11th ed. Philadelphia: Elsevier; 2022. 1392 p.
7. World Health Organization. Tuberculosis: Fact sheet. Geneva: WHO; 2026. Available from WHO. Tuberculosis remains one of the leading infectious causes of death globally.
8. National Heart, Lung, and Blood Institute. How the Lungs Work: The Respiratory System. Bethesda: NIH/NHLBI; updated online resource. This source describes airway anatomy, alveoli, and gas exchange.
9. World Health Organization. Chronic respiratory diseases: Overview. Geneva: WHO; updated online resource. This source outlines major chronic respiratory disorders and risk factors such as smoking, dust, and air pollution.