Висновки. Під впливом інфразвуку та ультразвуку відбуваються різноманітні зміни з боку різних органів і систем, які носять лікувальний та терапевтичний характер і зумовлюють підвищення неспецифічної резистентності організму і його стійкості до несприятливих факторів середовища.

PHYSICAL MECHANISM OF BREATHING

Amanouz O.
Scientific supervisor: Sheykina N. V.
National University of Pharmacy, Kharkiv, Ukraine
Amanouzoumayma00@gmail.com

Introduction. Breathing (or ventilation) is the process of moving air out and in the lungs to facilitate gas exchange with the internal environment, mostly to flush out carbon dioxide and bring in oxygen.

The aim. To study: definition of respiratory system, structure of respiratory system, stage of respiration (breathing), the composition of the inhaled and exhaled air, transport the gas in the blood, the partial pressure of gases in veins, arterial blood and tissues.

Materials and methods. The respiratory system (also respiratory apparatus, ventilatory system) is a biological system consisting of specific organs and structures used for gas exchange in animals and plants.

Research results. It includes nose, pharynx, larynx, glottis, trachea, bronchi and lungs. The nasal cavity is covered by the ciliated epithelium and is separated by the septum. The nasal cavity is divided into respiratory and olfactory parts and then pass to the larynx. It is situated at the cervical level, consists of cartilages, chords, junctions and passes to the trachea. Its length is 9 – 15 cm and it is divided to right and left bronchi at the thoracic level. Bronchi divided to form bronchioles that attach alveoli. Lungs are paired organ divided to right lung has three lobes and left lung has two lobes. lungs are surrounded by a separate pleural cavity formed by the pleural serous membranes. They have: parietal pleura (contacts with the walls of the thoracic cavity) and visceral pleura. The pleura cavity is filled with the pleural fluid.

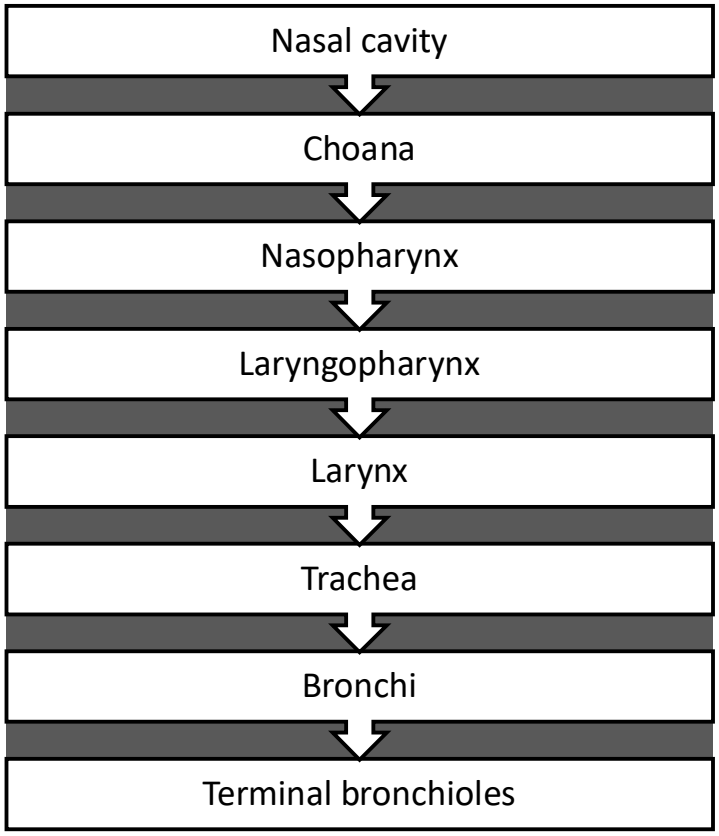
The stages of respiration:

1. External respiration: Ventilation of lungs.
2. The gas exchange in lungs: between the alveolar air the blood.
3. Transport of gases in the blood.
4. The gas exchange between the blood and tissues.
5. Internal respiration: cellular respiration.

The tidal volume is the volume of the air inspired or expired during the normal respiration (500ml). The inspiratory reserve volume is the amount of the air can be forcefully inspired after expiration of the normal tidal volume (3000ml). The expiratory reserve volume is the amount of the air that can be forcefully expired after expiration of the normal tidal volume (1300ml). The vital capacity (VCL) is the sum of the inspiratory reserve volume, the tidal volume and the expiratory

reserve volume, which is the maximum volume of the air that a person can expel from the respiratory tract after the maximum inspiration (500+3000+1300=4800ml).

Fig.1. Pathway of air in respiratory system



The gas exchange between the air in the lungs and the blood takes place in the alveoli. The alveolar ventilation is the volume of the air available for the gas exchange. It is less than the ventilation of the lungs because of a dead space. The dead space is the amount of air that those not take part in gas exchange (150 –180 ml). the alveolar ventilation is higher during deep breathing than hypopnea. The ventilation of the lungs is regulated by the way that provides the gas composition of the alveolar air.

The transport of oxygen and carbon dioxide between lungs and tissues is the function of the blood. As this gases entre the blood, dissolve in the plasma. They combine chemically with various blood components, and must are carried in combination with other atoms and molecules.

Almost all of the oxygen (over 98%) carried in the blood is combined with hemoglobin that occurs within the red blood cells. The result of this chemical reaction is oxyhemoglobin that is relatively unstable and as the partial pressure of oxygen decreases, it is released from oxyhemoglobin molecules. The oxygen – hemoglobin dissociation curve describes the percentage of hemoglobin saturated with oxygen at any given PO2. The partial pressure of CO2 increases in the tissue capillaries and caused decreasing of the ability of Hb to bind O2. As a result, tissues receive oxygen.

Carbon dioxide diffuses in to blood capillaries as a result of pressure differences in tissues (60 mm Hg) and the arterial blood (40mm Hg). Carbon dioxide is transported in the blood by three major ways: proximately 7% is transported as carbon dioxide dissolved in the plasma, approximately 23% is transported in combination with hemoglobin, and 70% is transported in the form of bicarbonate ions. Carbon dioxide from tissues diffuses into the red blood cells within the capillaries and reacts with water inside the red blood cells to form carbonic acid.

Gases can dissolve in fluids. The dissolution of gases in fluid lasts till the state of dynamic balance. The force that tends molecules of a gas to leave the fluid is called tension. The partial pressure is the pressure of one gas in another. In the alveolar air there are 1000 mm Hg of PO2 and 40mm Hg of PCO2. In the arterial blood they are 40 mm Hg of PO2 and 46mm Hg of PCO2 and in tissues- 60 mm Hg of PCO2 and 20-40 mm Hg of PO2.

Conclusions. The respiratory system plays a very important role in human body and it is responsible for obtaining oxygen and getting rid of carbon dioxide and aiding in speech production and in sensing odors**.**

THE EFFECT OF UV RADIATION ON HUMAN ORGANISM

Salah E. B.
Scientific supervisor: Sheykina N. V.
National University of Pharmacy, Kharkiv, Ukraine
Bannanisalah0@gmail.com

Introduction. Ultraviolet (UV) is a form of electromagnetic radiation with wavelength from 10 nm to 400 nm, shorter than that of visible light, but longer than X-rays. UV radiation is present in sunlight, and constitutes about 10% of the total electromagnetic radiation output from the Sun. While it has some benefits for people, including the creation of Vitamin D, it also can cause health risks.

The aim. To study the sources of UV radiation, types of UV radiation, the effect of UV radiation on biological objects.

Materials and methods. As we know that Ultraviolet is a form of electromagnetic radiation with wavelength from 10 nm to 400 nm. And the most important source of this radiation is the sun. Also there are some other *artificial* sources of UV radiation, for example: tanning beds, mercury vapor lighting (often found in stadiums and school gyms), some halogen, fluorescent, and incandescent lights, some types of lasers.

As for types of UV radiation, it is classified into three primary types: ultraviolet A (UVA), ultraviolet B (UVB), ultraviolet C (UVC).

These groups are based on the measure of their wavelength, which is measured in nanometers (nm= 0.000000001 meters or 1×10^{-9} m).

Table 1. Types of UV radiations

Wave type	UVA	UVB	UVC
Wavelength	315-399nm	280-314nm	100-279nm
Absorption level	Not absorbed by ozone layer	Mostly absorbed by ozone layer, but some of it reaches the Earth surface	Completely absorbed by the ozone layer and atmosphere

Research results. All of the UVC and most of the UVB radiation is absorbed by the earth's ozone layer, so nearly all of the UV radiation received on Earth is UVA. UVA and UVB radiation can both affect the human health. Even though UVA radiation is weaker than UVB, it penetrates