Exercise 1. Memorize the following words, pay attention to their Latin/Greek equivalents.

English	Latin/Greek	Ukrainian
lymphatic vessels	vasa lymphatica	лімфатичні судини
superficial [ˌsju:pəˈfiʃəl]	superficialis	поверховий, неглибокий, зовнішній
deep	profundus	глибокий
trunk	truncus	стовбур
duct	ductus	протока
node [nəʊd]	nodus	вузол
spleen	splen/lien	селезінка
thymus [ˈθaiməs]	thymus	загрудинна залоза, тимус
tonsil [ˈtɒnsl]	tonsilla/amygdala	мигдалина

Exercise 2. Learn the following anatomical and clinical terms.

mammary [ˈmæməri] що стосується молочної залози
femoral [ˈfemərəl] стегновий
tibial [ˈtibiəl] великогомілковий
axillary [ækˈsiləri] пахвовий
inguinal [ˈiŋgwin(ə)l] пахвинний
hilus [ˈhailəs] ворота
palatine [ˈpælətain] піднебінний
pharyngeal [ˌfærinˈʤiəl] глотковий
lingual [ˈliŋgwəl] язиковий
thymosin [ˈθaiməsin] тимозин (гормон)
splenectomy [splіˈnektəmi] видалення селезінки

Exercise 3. Read the text, remember the information about the lymphatic system from your anatomy lessons.

The lymphatic system consists of capillaries, nodes, ducts and lymphatic vessels, spread through the whole body (Fig. 13–1).

About 2 liters of lymph fill the lymphatic vessels. The lymphatic capillaries drain away excess tissue fluid that does not return to the blood capillaries. Then, they are to absorb protein from the tissue fluid and return it to the bloodstream. Before the lymph reaches the veins, it flows through a series of filters, called lymph nodes, where bacteria and other foreign substances are destroyed.

Lymphatic capillaries made of endothelium allow for easy passage of soluble materials and water. The lymphatic capillary begins blindly and the other end of it communicates with the larger lymphatic vessel.

The lymphatic vessels are thin-walled and delicate, they have the valves to prevent backflow in the same way. The lymphatic vessels include superficial and deep sets. They accompany the similar veins. The lymphatic vessels are named according to their location (see Fig. 13–1).

The two terminal vessels are the right lymphatic duct and the thoracic duct.

The right lymphatic duct receives the lymph from the right side of the head, neck, thorax and the right arm and empties into the right subclavian vein.

The rest of the body is drained by the thoracic duct, which is larger than the right lymphatic duct, and it empties into the left subclavian vein.

Lymph is moved by compression of the lymphatic vessels as skeletal muscles contract during movement. The lymph nodes are made of lymphoid tissue, which is characterized by removal of impurities (carbon particles, cancer cells, pathogenic organisms, dead blood cells) through filtration and phagocytosis and production of antibodies (substances in the blood that aid in combating infection) or attacking of foreign invaders directly. The lymph nodes are small, rounded masses covered with fibrous connective capsule, they have the hilus (the exit) for lymph vessels carrying the lymph out of the node.

The nodes are the filters of lymph. Another lymphoid masses are tonsils. They are designed to filter tissue fluid. The thymus is located in the upper thorax beneath the sternum. It has been considered to be a part of the lymphatic system. The thymus plays a key role in the development of the immune system before birth and during the first few months of infancy.

The thymus is most active during early life. After puberty (період статевої зрілості), the tissue undergoes changes, it shrinks in size and is replaced by connective tissue.

The spleen is an organ designed to filter the blood. It's located in the abdominal cavity under the diaphragm, it is soft with a purplish color. It's a flattened organ about 12.5 to 16 cm long and 5 to 7.5 cm wide. The spleen has an unusually large blood supply. The function of the spleen are listed below:

1. Cleansing the blood by filtration and phagocytosis.
2. Destroying old worn-out red blood cells.
3. Producing red blood cells before birth.
4. Serving as a storage of blood.

Exercise 4. Make up a plan of the text.

Exercise 5. Translate the passages about the thymus and the spleen.

Exercise 6. Find English equivalents in the text.

Дозволяють легко просочуватись розчинним речовинам і воді; лімфатичні і кровоносні капіляри; всмоктують білки з тканинної рідини; з'єднують із більшими лімфатичними судинами; права лімфатична протока; грудинна протока; лімфатичний капіляр з одного боку сліпий (закритий); рухається під тиском; вузли; мигдалини; за грудиною; зменшується у розмірі; очищають кров.

Exercise 7. Answer the following questions.

1. What is lymph? How much lymph is there in the body?
2. Can you characterize the lymphatic capillary?
3. What are nodes?
4. What are their functions?
5. What can you say about the lymphatic vessels?
6. What are the two main lymphatic ducts?
7. What is the thymus and what are its functions?
8. What organ is the spleen? Can man live without the spleen?
9. What are the functions of the spleen?

UNIT FOURTEEN

I	**Speaking**	Body Defenses
II	**Grammar**	Subjective Participle Construction (§104)
III	**Independent Work**	AIDS

I. Speaking: Body Defenses

After careful study of this unit you should be able to:
– explain the terms "immunity", "serum", "vaccine";
– list several types of inborn immunity;
– differentiate between natural and artificial acquired immunity;
– differentiate between active and passive immunity;
– define antigen and antibody;
– list several disorders of the immune system.

Exercise 1. Learn the following words by heart.
allergy [ˈælədʒi] алергія
antibody [ˌænti ˈbɒdi] антитіло
antigen [ˈæntidʒən] антиген
antiserum [ˌænti ˈsierəm] антисироватка
acquired [əkˈwaiəd] набутий
artificial [ˌɑ:tiˈfiʃiəl] штучний
autoimmunity [ˌɔ:tɒiˈmju:niti] автоімунітет
gamma globulin [ˌgæməˈglɒbjʊlin] гамаглобулін
irritate [ˈiriteit] подразнювати
immunity [iˈmju:niti] імунітет
immunization [iˌmju:naiˈzeiʃn] імунізація
inflammation [ˌinfləˈmeiʃn] запалення
inborn [ˈinbɔ:n] вроджений
lymphocyte – лімфоцит
macrophage [ˌmækrəˈfeidʒ] макрофаг
toxin [ˈtɒksin] отрута, токсин
toxoid [ˈtɒksɔid] токсоїд, анатоксин
vaccine [ˈvæksi:n] вакцина
pus [pʌs] гній
to get rid of – позбутися
harmful agent [ˈhɑ:mfulˈeidʒənt] шкідлива речовина

Exercise 2. Read the text, translate it, make a plan of it.

Body Defenses Against Disease

In our environment there is a great number of organisms harmful to the human being. The job of protecting us from these harmful agents belongs in part to certain blood cells and the lymphatic system, which together make up our immune system.

The human body has the ability to produce toxins, which damage the body. Inflammation is the body's effort to get rid of anything that irritates it.

Irritants can be bacteria, friction, chemicals, X-rays, fire, cuts or blows, etc.

Cells infected with viruses and certain other agents produce interferon, the substance that prevents infection of other cells.

Immunity is the power of an individual to resist or overcome the effects of a particular disease or other harmful agents.

There are two kinds of immunity: inborn and acquired. Acquired immunity can be natural or artificial; and also it can be active or passive.

Each person has his own inborn immunity. Acquired immunity is obtained during the life of the person. The immunity response is based on a reaction between antigens and antibodies. Antigens are any foreign substances entering the body.

Lymphocytes react to these foreign substances, they can destroy foreign cells directly, or release substances that stimulate other lymphocytes and macrophages in the destruction of foreign cells (clones of plasma cells). These plasma cells produce specific antibodies that circulate in the blood as gamma globulin fraction.

Each time a person is invaded by the organisms of a disease, his cells may produce antibodies that provide immunity against the infection. Such immunity may last for years and in some cases it lasts for a whole life. It is active immunity. Passive immunity is acquired by a fetus through the placenta and by infants for about six months. Nursing an infant can lengthen this period of protection owing to the presence of specific antibodies in breast milk.

Artificially acquired immunity is created by vaccination or immunization in active or passive ways. Active immunization is immunization with vaccines. Passive immunization is administration of immune serum (antiserum).

Here we can name some disorders of the immune system:

- allergy is hypersensivity to normally harmless substances (allergen);
- autoimmunity is abnormal response to body's own tissues;
- immune deficiency disease is failure in the immune system. It can be hereditary or acquired (AIDS);
- cancer may be partly due to failure of immune system, because it destroys body cells.

Exercise 3. What are the Latin/Greek equivalents of the following English words?

Cells, tissue, allergy, disease, substance, milk, bacterium, antibody, toxin, lymphocyte, macrophage.

Exercise 4. Answer the questions. What do we call:

1) a person who takes care of patients?
2) a doctor who operates on patients?
3) a doctor who treats patients with different medicines and remedies?
4) a person who discovers something new in the field of science?
5) a house where students live?
6) a grown-up person?
7) the organ which pumps the blood through the arteries and veins?

UNIT FIFTEEN

I	**Speaking**	Respiratory System
II	**Grammar**	Absolute Participial Complex (§105)
III	**Independent Work**	Lungs

I. Speaking: Respiratory System

After careful study of this unit you should be able to:
- define respiration and describe three phases of respiration;
- name all the structures of the respiratory system;
- explain the mechanism of pulmonary ventilation;
- list the ways of transportation of oxygen and carbon dioxide in the blood;
- list five symptoms of abnormal respiration.

Exercise 1. Learn the words by heart, pay attention to their Latin/Greek equivalents.

English	Latin/Greek	Ukrainian
alveolus [æl´viələs]	alveolus	альвеола
bronchiole	bronchiolus	бронхіола
bronchus [´brɒnkəs]	bronchus	бронх
diaphragm [´daiəfræm]	diaphragma	діафрагма
larynx [´læriŋks]	larynx	гортань
lung	pulmo-/pneum-	легеня
mediastinum	mediastinum	середостіння
pharynx [´færiŋks]	pharynx	глотка
pleura [´plʊərə]	pleura	плевра
respiration, breathing	respiratio/pnoē	дихання
trachea [trə´ki:ə]	trachea	трахея
ventilation	ventilatio	вентиляція
nasal cavity	cavum nasi	носова порожнина
inhalation	inhalatio	вдих
exhalation	exhalatio	видих
lobe	lobus	частка
oxygen	oxygenium	кисень
carbon dioxide	carbo dioxinum	вуглекислий газ
bronchial tree	arbor bronchialis	бронхіальне дерево

Exercise 2. Read the following word combinations and translate them, using a dictionary.

To breathe with lungs; pulmonary ventilation; nasal cavities; vocal organ; air movement; gas exchanges; respiratory rates; diffusion of gases.

Exercise 3. Read the text, translate and retell it.

Respiration

Respiration is the process by which oxygen is obtained from the environment and transported to the cells, and carbon dioxide is exchanged from the cells.

Respiration includes three phases:

1. Pulmonary ventilation is normally accomplished by inspiration and expiration.
2. The diffusion of gases includes the passage of oxygen from air sacs into the blood and of carbon dioxide out of the blood.
3. The transport of oxygen and carbon dioxide by the circulating blood.

The respiratory system includes the nasal cavities, the pharynx, the larynx, the trachea, the bronchi and the lungs with their conducting tubes and air sacs. The nasal cavities filter, warm and moisten air, which we inhale. The pharynx (throat) carries air into the respiratory tract and food into the digestive tract. The larynx (voice organ) contains vocal cords. The trachea is the windpipe. The bronchi are the continuations of the trachea, they are two in number; they enter the lungs and then subdivide again and again making the bronchial tree. The smallest subdivisions of the bronchi are bronchioles. The lungs are covered with the membrane called pleura. The pleura not only encloses the lung but also lines the chest walls. Mediastinum is the space for the heart, great blood vessels, esophagus, trachea, and lymph nodes; it is located between the lungs. The lungs consist of lobes, which subdivide into lobules. The tiny air sacs in the lungs are called alveoli.

Physiology of respiration includes inhalation or inspiration (when air comes into the lungs), and exhalation or expiration (when air goes out of the lungs).

The respiratory control centers, located in the medulla and pons of the brain stem, regulate the process of respiration. Respiration is regulated so that the level of oxygen, carbon dioxide, and acid are kept within certain limits. The control centers regulate the rate, depth, and rhythm of respiration.

Exercise 4. Describe three phases of respiration.

Exercise 5. Answer the following questions.

1. What does the term *respiration* mean?
2. What do the respiratory organs consist of?
3. What is each of them characterized by?
4. What processes does the physiology of respiration include?
5. What regulates respiration?
6. Where are the lungs located?

Exercise 6. Describe the structure of the respiratory system. Use Fig. 15–1.