SELECTED ENGLISH READINGS OF CLINICAL MEDICINE

临床医学英语

邹孜彦　主审

马丽娃　杨　蓉　编著

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前　言

我们在国外学习以及在国内做医学院外语教师的工作中，发现我们培养的学生阅读英语书刊和用英语写医学论文和文摘的能力较差。大多数去英、美和加拿大的中国医生不能做临床医生，其主要原因是医学专业英语较差，很难通过英、美和加拿大等国的医生执照考试，从而萌发了编写一本临床医学专业英语的想法。

目前国内虽然已有类似的专业医学英语书籍，但有些专业英语教科书文字艰涩，已非当代流行英语。我们所编的这本临床医学专业英语，文字浅显易懂而内容新颖充实，适合我国高等医科院校的本科生、研究生使用，也适合临床医生研读，既可以供课堂教学使用，也可以供学生自学。

本书根据国外最新资料编写，内容主要为临床常见病，如心血管疾病（心力衰竭、高血压、冠心病），呼吸道疾病（支气管炎、肺炎、严重性呼吸道综合征——俗称“SARS”或“非典”、哮喘），消化道疾病（胃炎、消化性溃疡、肝炎），血液病（白血病、麻风病），眼病（白内障、青光眼）等。

本书深入浅出，内容丰富，脉络清晰，信息量大，覆盖面广，纵览全书，可以看出这是一本较为全面，通俗易懂，注重基础概念，紧跟学科发展前沿的临床医学英语教材。

本书的特点是强调医学词汇的构成，较系统地将常用的希腊语和拉丁语医学词根及前后缀写在每一课的课文后面，以便学生学习掌握。本书还编有练习题，以供学生复习巩固之用。通过学习，使学生既能学到医学知识，全面提高阅读医学英语的水平，又能掌握医学词汇，从而达到在短期内能够阅读医学英语书刊的目的。书中的医学词汇构成比较全面系统，并将常见的前后缀和医学有关词根列于书后作为附录。

现代英语的特点是简单明了。我们在编写过程中，对课文文字删繁就简，力求简明易懂，有助于学生自学。

本书由邹孜彦和马丽娃构思选材，马丽娃和杨蓉负责编写，邹孜彦主审。具体分工：马丽娃负责编撰第二章、第三章、第七章、第八章、第九章及附录；杨蓉负责编撰第一章、第四章、第五章、第六章、第十章；邹孜彦负责全书的总审校。

我们虽然尽力追求完美，但仍难免有疏漏不妥之处，期望同行和读者不吝指正。

编　者

2006 年 6 月

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Chapter One Basics

Unit One Cells, Tissues and Organs

Biological students have to study anatomy and physiology of living organisms. Anatomy is the study of structure, and physiology is the study of function.

As living organisms have very complex structures, anatomy is organized by levels, from the smallest components of cells to the largest organs and their relationships to other organs. Gross anatomy is the study of the body's organs as seen with the naked eye during visual inspection and dissection. Cellular anatomy is the study of cells and their components, which require special instruments such as microscopes and special techniques for observation.

Cells

Often thought of as the smallest unit of living organisms, a cell is made up of many even smaller parts, each with its own function. Human cells vary in size, but all are quite small. The largest, a fertilized egg, is too small to be seen with the naked eye.

Human cells have a membrane that holds the contents together. However, this membrane is not just a sac. It has receptors that identify the cell to other cells. The receptors also react to substances produced in the body and to drugs taken into the body, selectively allowing these substances or drugs to enter and leave the cell. Reactions that take place at the receptors often alter and control a cell's functions.

Within the cell membrane are two major compartments, the cytoplasm and the nucleus. The cytoplasm contains structures that consume and transform energy and carry out the cell's functions; the nucleus contains the cell's genetic material and the structures that control cell division and reproduction.

The body is composed of many different types of cells, each with its own structure and function. Some, such as white blood cells, move freely, unattached to other cells. Others, such as muscle cells, are firmly attached one to another. Some cells, such as skin cells, divide and reproduce quickly; nerve cells, on the other hand, don't reproduce at all. Some cells, especially glandular cells, have as their primary function the production of complex substances, such as a hormone or an enzyme. For example, cells in the breast produce milk, those in the pancreas produce insulin, those in the lining of the lungs produce mucus, and those in the mouth produce saliva. Other cells have primary functions that are not related to the production of substances—for

example, cells in the muscles and heart contract. Nerve cells conduct electrical impulses, allowing communications between the central nervous system (brain and spinal cord) and the rest of the body.

Tissues and Organs

Related cells joined together are collectively referred to as a tissue. The cells in a tissue are not identical, but they work together to accomplish specific functions. A sample of tissue removed for examination under a microscope (biopsy) contains many types of cells, even though a doctor may be interested in only one specific type.

Connective tissue is the tough, often fibrous tissue that binds the body's structures together and provides support. It is present in almost every organ, forming a large part of skin, tendons, and muscles. The characteristics of connective tissue and the type of cells it contains vary, depending on where it's found in the body.

The body's functions are conducted by organs. Each organ is a recognizable structure that performs specific functions—for example, the heart, lungs, liver, eyes and stomach. An organ is made up of several types of tissue and therefore several types of cells. For example, the heart contains muscle tissue that contracts to pump blood, fibrous tissue that makes up the heart valves, and special cells that maintain the rate and rhythm of heartbeats. The eye contains muscle cells that open and close the pupil, clear cells that make up the lens and cornea, cells that produce the fluid within the eye, cells that sense light, and nerve cells that conduct impulses to the brain. Even an organ as apparently simple as the gallbladder contains different types of cells, such as those that form a lining resistant to the irritative effects of the bile, muscle cells that contract to expel bile, and cells that form the fibrous outer wall holding the sac together.

Word List

living organism *n.* 生物
function *n.* 功能
component *n.* 成分,组成部分
gross anatomy *n.* 大体解剖
naked eye *n.* 肉眼
dissection *n.* 解剖
fertilized egg *n.* 受精卵
receptor *n.* 感受器
reaction *n.* 反应
substance *n.* 物质
compartment *n.* 隔间
cytoplasm *n.* 细胞质
genetic *adj.* 基因的
glandular *adj.* 腺体的
hormone *n.* 激素
enzyme *n.* 酶
pancreas *n.* 胰腺
insulin *n.* 胰岛素
mucus *n.* 黏液
saliva *n.* 唾液
contract *v.* 收缩
impulse *n.* 冲动
identical *adj.* 相同的
biopsy *n.* 活检
connective tissue *n.* 结缔组织
heart valve *n.* 心脏瓣膜
rhythm *n.* 节奏
pupil *n.* 眼球

lens *n.* 晶状体
cornea *n.* 角膜
gallbladder *n.* 胆囊
bile *n.* 胆汁
expel *v.* 排出

Formation of Medical Terms

bio- Gr. *Bios* life, a combination form life, of living things

biology – the science that deals with living organisms, as plants and animals biopsy removal of living tissue from the body for diagnostic examination

bioassay – a technique for determining the power of a drug by measuring its effects on a test specimen against those of standard substance

biochemistry – a science that deals with the chemistry of life processes in plants and animals

bio – compatible – compatible with the living tissue, as a prosthetic material or device that is rejected or does not cause infection

biocybernetics – the branch of cybernetics that deals with the control and communications systems of living organisms

biolysis – the destruction of life, as by microorganisms biometrics that branch of biology that deals with its data statistically and by mathematical analysis

biomolecule – an organic compound made in a living system bionics the science of designing instruments or systems modeled after living organisms

biophysics – the study of biological phenomena using the principles of physics

bioscience – any science that deals with the functions or problems of living organisms

biostatistics – the branch of biometrics dealing with demography, esp. vital statistics biotelemetry the use of telemeters to monitor the physical condition or responses of animals, human beings, etc. at great distances, as in spacecraft

biotherapy – the treatment of disease by means of substances, as serums, vaccines, penicillin, etc, secreted by or derived from living organisms

-ology – a branch of learning; science

biology – the science that deals with living organisms, as plants and animals

physiology – the branch of biology dealing with the functions and vital processes of living organisms or their parts and organs

pharmacology – the study of the preparation, qualities, and uses of drugs dermatologythe branch of medicine dealing with the skin and its diseases

neurology – the branch of medicine dealing with the nervous system, its structure, and its diseases

stomatology – the branch of medicine dealing with the mouth and its diseases gynecology the branch of medicine dealing with the study and treatment of the female reproductive system, including the breasts

radiology – the science dealing with X – rays and other forms of radiant energy, esp. as used in medicine for diagnosing and treating disease

oncology – the branch of medicine dealing with neoplasms ophthalmology the branch of medicine dealing with the structure, function and diseases of the eye

otolaryngology – the branch or practice of medicine dealing with disorders of the ear, nose, and throat

epidemiology – the branch of medicine that investigates the causes and control of epidemics
endocrinology – the branch of medicine dealing with the endocrine glands and their hormones
pathology – the branch of medicine that deals with the nature of disease, esp. with the structural and functional changes caused by disease

Exercises

Ⅰ. Complete the following sentences according to the text:

1. Biological students have to study _____ and _____ of _____.
2. Anatomy is the study of _____.
3. Physiology is the study of _____.
4. Grosss anatomy is the study of _____.
5. Cellular anatomy is the study of _____ and _____.
6. A cell is made up of _____, _____, and _____.
7. The membrane of the cell has _____ that identify the cell to _____.
8. The receptors react to _____ produced in the body and to _____ taken into the body, slectively allowing these substances or drugs to _____ and _____ the cell.
9. The cytoplasm contains structures that _____ and _____ energy and _____ the cell's functions.
10. The nucleus contains the cell's _____ and the structures that _____ cell division and reproduction.
11. Muscles cells are _____ to one another.
12. Glandular cells have as their primary function the _____ of _____, such as a _____ or an _____.
13. Cells in the pancreas produce _____.
14. Cells in the mouth produce _____.
15. Related cells joined together are collectively referred to as a _____.

Ⅱ. Analyze the following medical terms and give the meaning in Chinese:

1. biochemistry
2. biophysics
3. biotelemetry
4. biocybernetics
5. otolaryngology
6. pathology
7. dermatology
8. neurology

Ⅲ. Fill in the blanks with proper form of the appropriate words and phrases below:

Function (n. & v.), be made up of, component, reaction, contract (v.), expel

1. A car _____ many different parts.
2. The cardiovascular system _____ the heart and blood vessels.
3. The audience _____ the students and their parents as well as the teachers of the school.
4. The main _____ of the kidneys is to purify the blood.
5. The _____ the police perform is to maintain the established order of society.
6. His lungs could no longer _____ because of pneumosilicosis.

7. When one exhales, air is _____ from the lungs.
8. Metals usually expand when heated and they _____ when cooled.
9. When you bend your elbow, the muscles of the arm _____.
10. We have installed a fan to _____ the cooking smells from the kitchen.
11. A chemist can separate a medicine into its _____.
12. The engine has more than 300 _____, made of a number of different materials.
13. The appendix is a useless and sometimes harmful _____ of the body.
14. Penicillin may produce a fatal allergic _____ in some people.
15. His _____ to the doctor's treatment was satisfactory.

IV. Translate the following into Chinese:

The body is composed of many different types of cells, each with its own structure and function. Some, such as white blood cells, move freely, unattached to other cells. Others, such as muscle cells, are firmly attached one to another. Some cells, such as skin cells, divide and reproduce quickly; nerve cells, on the other hand, don't reproduce at all. Some cells, especially glandular cells, have as their primary function the production of complex substances, such as a hormone or an enzyme. For example, cells in the breast produce milk, those in the pancreas produce insulin, those in the lining of the lungs produce mucus, and those in the mouth produce saliva.

V. Grammar Exercise

Directions: Fill in the blanks with articles where necessary:

1. When you travel by air from _____ China to _____ United States, you have to cross _____ Pacific Ocean and/or _____ Arctic.
2. _____ Capitol is referred to as _____ American Congress.
3. _____ Pentagon is used to mean _____ U. S. Defence Department.
4. While he went to see his brother in Beijing, he visited _____ Imperial Palace, _____ Temple of Heaven, _____ Summer Palace and _____ Western Hills.
5. _____ Rockies and _____ Appalachians are the two largest mountain ranges in the United States.
6. China's two largest rivers are _____ Yellow River and _____ Yangtze River.
7. VOA and BBC stand for _____ Voice of America and _____ British Broadcasting Corporation, _____ two largest mass media of _____ world.
8. China is now a member of most of the global organizations, from _____ United Nations to _____ World Trade Organization, and _____ World Health Organization.
9. _____ House of Commons in Britain is similar to _____ House of Representatives in the United States.
10. Washington is _____ capital of _____ United States.
11. _____ State Council in China functions as _____ Central Government; _____ US State Department is actually _____ Foreign Office or Ministry of Foreign Affairs in other countries.
12. Some of the parking lots outside some of _____ malls in American cities are much larger than _____ Tian'anmen Square in Beijing.

Unit Two Organ Systems

An organ system is a group of organs that have similar functions. The organ system is the organizational unit by which medicine is studied, diseases are generally categorized, and treatments are planned.

For example, the cardiovascular system, which includes the heart (cardio) and blood vessels (vascular), is responsible for pumping and circulating the blood. The digestive system, extending from the mouth to the anus, is responsible for receiving and digesting food and excreting waste. This system includes not only the stomach, small intestine, and large intestine, which move food, but also associated organs such as the pancreas, liver and gallbladder, which produce digestive enzymes, remove toxins, and store substances necessary for digestion. The musculoskeletal system includes the bones, muscles, ligaments, tendons, and joints that support and move the body.

Of course, organ systems do not function in isolation. For example, after a large meal is eaten, the digestive system needs more blood to perform its functions. Therefore, it enlists the aid of the cardiovascular and nervous systems. Blood vessels of the digestive system widen to transport more blood. Nerve impulses are sent to the brain, notifying it of the increased work. The digestive system even directly stimulates the heart through nerve impulses and chemicals released into the bloodstream. The heart responds by pumping more blood; the brain responds by perceiving less hunger, more fullness, and less interest in vigorous activity.

Communications between organs and organ systems is vital. Communication allows the body to adjust the function of each organ according to the needs of the whole body. The heart must know when the body is resting so that it can slow down and when organs need more blood so that it can speed up. The kidneys must know when the body has too much fluid so that they can excrete more urine and when the body is dehydrated so that they can conserve water.

Through communication, the body keeps itself in balance—a concept called homeostasis. Through homeostasis, organs neither underproduce nor overproduce, and each organ facilitates the functions of every other organ.

Communication to maintain homeostasis can occur through the nervous system or through chemical stimulation. The autonomic nervous system, in large part, controls the complex communication network that regulates bodily functions. This part of the nervous system functions without a person's thinking about it and without much noticeable indication that it is working. Chemicals used to communicate are called transmitters. Transmitters that conduct messages between parts of the nervous system are called neurotransmitters.

One of the best known transmitters is the hormone epinephrine (adrenaline). When a person is suddenly stressed or frightened, the brain instantly sends a message to the adrenal glands, which quickly release epinephrine. Within moments, this chemical has the entire body on alert, a response sometimes called preparation for fight or flight. The heart beats more rapidly and powerfully, the eyes dilate to allow more light in, breathing quickens, and the activity of the digestive system decreases to allow more blood to go to the muscles.

Other chemical communications are less dramatic but equally effective. For example, when the body becomes dehydrated and needs more water, the volume of blood circulating through the cardiovascular system decreases. This decreased blood volume is perceived by receptors in the arteries in the neck. They respond by sending impulses through nerves to the pituitary gland, at the base of the brain, which then produces antidiuretic hormone. This hormone signals the kidneys to produce less urine and retain more water. Simultaneously, the brain senses thirst, stimulating a person to drink.

The body also has a group of organs—the endocrine system—whose primary function is to produce hormones that regulate the function of other organs. For example, the thyroid gland produces thyroid hormone, which controls the metabolic rate (the speed at which the body's chemical functions proceed); the pancreas produces insulin, which controls the use of sugar, and the adrenal glands produce epinephrine, which stimulates many organs to prepare the body for stress.

Word List

categorize *v.* 分类
cardiovascular *adj.* 心血管的
digestive *adj.* 消化的
digest *v.* 消化
excrete *v.* 分泌出
toxin *n.* 毒素
musculoskeletalsystem 肌肉骨骼系统
notify *v.* 通知
stimulate *v.* 刺激
perceive *v.* 察觉，感觉
vigorous *adj.* 强有力的，精力充沛的
vital *adj.* 重要的
adjust *v.* 调节
fluid *n.* 体液
urine *n.* 尿
dehydrated *adj.* 脱水
conserve *v.* 保留
keep... in balance 保持平衡
homeostasis *n.* 内环境稳定
facilitates *v.* 使容易便利
autonomic *adj.* 自主的
regulate *v.* 调整
transmitter *n.* 介质，传递质
neurotransmitter *n.* 神经传递质
epinephrine (adrenaline) *n.* 肾上腺素
on alert 警惕
dilate *v.* 扩大
artery *n.* 动脉
pituitary gland *n.* 垂体腺
antidiuretic 止尿药
simultaneously *adv.* 同时
endocrine system 内分泌系统
metabolic *adj.* 代谢的
thyroid gland 甲状腺

Formation of Medical Terms

cardio- Gr. heart

cardiology – the branch of medicine dealing with the heart, its functions, and its diseases
cardiopulmonary – involving the heart and lungs as they function interdependently
cardiomyopathy – any of various diseases of the heart muscle
cardiotachometer – a device for counting heartbeats, usually displaying the number of beats per minute
carditis – inflammation of the heart
cardiovascular – of the heart and the blood vessels as a unified body system
electrocardiogram – graphic tracing showing the variations in electric force which trigger the contractions of the heart
cardiomegalia – enlargement of the heart
cardiometry – a method of measuring the force of the heart
cardionephric – of the heart and the kidneys as they function interdependently

hydro- Gr. water ;containinghydrogen

hydrocephalus – a condition characterized by an abnormal increase in the amount of fluid in the cranium, esp. in young children
hydrochloric acid – a strong, highly corrosive acid, that is a solution of the gas hydrogen chloride
hydrochloride – a compound of hydrochloric acid and an organic base
hydrotherapy – treatment of disease by the external or internal use of water, as with baths, compresses, couches, etc.
hydrothorax – a condition marked by the accumulation of watery fluid in the pleural cavity
hydroperitoneum – a condition marked by the accumulation of water in the abdomen

homeo-, homo- Gr. the same; similar

homeomorphous – of the same shape
homogamy – inbreeding in an isolated group of individuals of the same species
homogeneous – the same in structure, quality, etc; similar or identical
homogenesis – inbreeding of the same species
homoeroticism – homosexuality

auto- Gr. *autos*, self

autoantibody – an antibody that acts against the body's own molecules and tissues and may cause an autoimmune disorder
autoplasty – the repairing of injuries by grafting in tissues from another part of the patient's body
autophobia – a condition in which a person fears oneself
automatic – self – moving
autophagia – self – consumption; eating one's own meat
autotransplant – transplant skin, tissues, etc. from one's own body

neuro-, neura- Gr. neuron nerve

neuralgia – severe pain along the course of a nerve or in its area of distribution
neuroanatomy – anatomy of the nervous system

neurocardiac – involving the nervous system and the heart as they function interdependently
neurofibroma – a tumor, usually benign, that consists of nerve fibers and connective tissue, caused by an abnormal proliferation of Schwann cells
neuropsychiatry – a branch of medicine dealing with disorders of both the mindand the nervous system
neurosis – any of the mental disorders; any emotional disturbance other than a psychosis

epi- Gr. at, on, over, beside,

epidermis – the outermost layer of the skin in vertebrates
epididymis – a long oval – shaped structure attached to the rear upper surface of each testicle, consisting mainly of the sperm ducts of the testicles
epiglottis – the thin, triangular, lid – like piece of cartilage that folds back over the opening of the windpipe during swallowing, this preventing food, etc. from entering the lungs
epigastrium – the upper middle portion of the abdomen including the area over and in front of the stomach
epinephrine – a hormone secreted by the medulla of the adrenal gland, that stimulates the heart, increases blood sugar, muscular strength, and endurance, etc.
epithelium – cellular tissue covering external body surfaces, as epidermis, or lining internal surfaces, as hollow organs, vessels, etc.

Exercises

Ⅰ. Complete the following sentences according to the text:

1. An organ system is a group of organs that have _____functions.
2. The cardiovascular systemis responsible for _____and _____the blood.
3. The digestive system is responsible for _____for _____and _____food and _____waste.
4. Communication between organs and organ systems allows the body to _____the function of each organ according to the needs of the _____.
5. The autonomic nervous system _____without a person's thinking about it.
6. When a person is suddenly stressed or frightened, the _____instantly sends a _____to the _____, which quickly release epinephrine.
7. When a body becomes dehydrated and needs more water, the volume of blood _____through the _____decreases.
8. The receptors in the arteries in the neck respond by sending _____through nerves to the pituitary gland, which then producesantidiuretic _____.
9. The pancreas produces _____, which controls the use of _____.
10. The adrenal glands produce _____, which _____many organs to prepare the body for stress.

Ⅱ. Analyze the following medical terms and give the meaning in Chinese:

1. cardiopulmonary
2. cardiomyopathy
3. electrocardiogram
4. cardiomegalia
5. hydrochloride
6. hydrothorax

7. homeomorphous
8. autoantibody
9. neurofibroma
10. epithelium
11. epigastrium

Ⅲ. Fill in the blanks with proper form of the appropriate words and phrases below:

excrete, *perceive*, *facilitate*, *regulate*, *on alert*

1. The police are _____ for any suspicious packages that might contain bombs.
2. The army was put _____ as the peace talks began to fail.
3. You can _____ the temperature in the house by adjusting the thermostat and the radiators.
4. Her mother strictly _____ how much TV she can watch.
5. The new ramp will _____ the entry of wheelchairs.
6. The company offered to _____ an international conference in the following _____ year.
7. I _____ a note of unhappiness in her voice.
8. Following recession, people no longer _____ that the value of their houses will continue to rise.
9. Most toxins are naturally _____ from the body.
10. Some people _____ more often than others.

Ⅳ. Translate the following into Chinese:

One of the best known transmitters is the hormone epinephrine (adrenaline). When a person is suddenly stressed or frightened, the brain instantly sends a message to the adrenal glands, which quickly release epinephrine. Within moments, this chemical has the entire body on alert, a response sometimes called preparation for fight or flight. The heart beats more rapidly and powerfully, the eyes dilate to allow more light in, breathing quickens , and the activity of the digestive system decreases to allow more blood to go to the muscles.

Ⅴ. Grammar Exercise

Directions: Fill in the blanks with articles where necessary:

1. _____ meat is of different kinds. There are _____ pork, _____ beef, and _____ mutton. _____ Pork is _____ meat of _____ hogs, _____ beef is _____ meat of _____ cattle, and _____ mutton is _____ meat of _____ goats.
2. The old man lived _____ very long life, though he had suffered a lot in _____ life.
3. I don't like _____ steak we had at the restaurant.
4. _____ autobiography is a book about _____ life of _____ the author himself.
5. _____ money is a means of commercial exchange. _____ different countries use _____ different currencies, though some of these currencies may be used internationally in _____ trade.
6. _____ mail is delivered here on workdays only, but _____ express mail is delivered without delay.
7. The boy often gazes into _____ sky and wonders if there is _____ life on _____ other stars.
8. Where there is _____ water, there must be _____ life.
9. _____ electricity was suddenly cut off by _____ hurricane Isabel in some regions of _____ east coast states.
10. Longjing is _____ famous tea produced in Hangzhou, China.

Chapter Two Cardiovascular System

Unit One The Heart and Blood Vessels

The heart, a hollow muscular organ, lies in the center of the chest. The right and the left sides of the heart each have an upper chamber (atrium), which collects blood, and a lower chamber (ventricle), which ejects blood. To ensure that blood flows in only one direction, the ventricles have an inlet and an outlet valve.

The heart's primary functions are to supply oxygen to the body and to rid the body of waste products (carbon dioxide). The heart performs these functions by collecting oxygen-depleted blood from the body and pumping it to the lungs, where it picks up oxygen and drops off carbon dioxide; the heart then collects the oxygen-enriched blood from the lungs and pumps it to the tissues of the entire body.

During each heartbeat, each heart chamber relaxes as it fills, a period called diastole, and then contracts as it pumps blood, a period called systole. The two atria relax together and contract together, and the two ventricles relax together and contract together.

First, oxygen-depleted, carbon dioxide-laden blood from the body flows through the two largest veins (the venae cavae) into the right atrium. When this chamber fills, it propels the blood into the right ventricle. When the right ventricle fills, it pumps the blood through the pulmonary valve into the pulmonary arteries, which supply the lungs. The blood then flows through tiny capillaries, which surround the air sacs in the lungs, absorbing oxygen and giving up carbon dioxide, which is then exhaled. The now oxygen-rich blood flows through the pulmonary veins into the left atrium. This circuit between the right side of the heart, the lungs, and the left atrium is called the pulmonary circulation. When the left atrium fills, it propels the oxygen-rich blood into the left ventricle. When this chamber fills, it pumps the blood through the aortic valve into the aorta, the largest artery in the body. This oxygen-rich blood supplies all of the body except the lungs.

The rest of the circulatory (cardiovascular) system is composed of arteries, arterioles, capillaries, venules, and veins. The arteries, which are strong and flexible, carry blood away from the heart and bear the highest blood pressures. Their resilience helps maintain blood pressure while the heart is between beats. The smaller arteries and arterioles have muscular walls that adjust their diameter to increase or decrease blood flow to a particular area. Capillaries are tiny, extremely thin-walled