创新大学英语

临床医学英语教程

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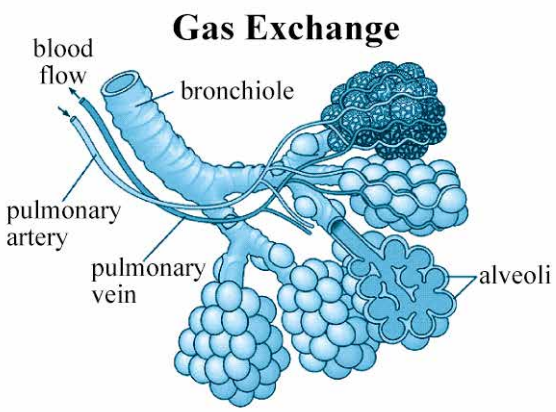
目 录

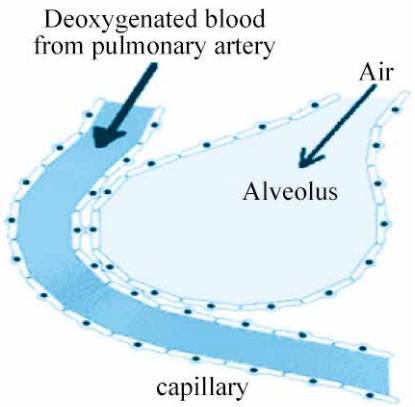
Unit 1

Passage A
Respiratory Emergencies

Pre-reading Activities

Ⅰ. Look at the diagrams below. Talk about how gas exchange takes place in the lung.





Ⅱ. Try to understand the following terms before your reading.

eupnea /juːp'nɪə/ *n.* normal, relaxed breathing 正常呼吸

dyspnea /dɪsp'nɪə/ *n.* difficulty in breathing 呼吸困难

tachypnea /ˌtækɪp'nɪə/ *n.* rapid breathing 呼吸急促

apnea /æp'nɪə/ *n.* temporary absence or stop of breathing 呼吸暂停

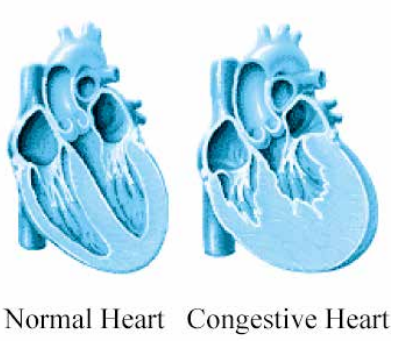
bradypnea /bræ'dɪpnɪə/ *n.* abnormal slowness of respiration 呼吸过慢

Text

Introduction

1 Any patient who is presenting with some degree of respiratory effort is in respiratory distress[1]. The conditions that might result in respiratory distress include infectious disease processes and "mechanical" obstruction to the proper functioning of the system. Some of them can be corrected, most of them cannot, and all of them will be treated with high concentration oxygen.

Congestive Heart Failure


Normal Heart Congestive Heart

② This is a condition that starts when one side of the heart becomes less effective, usually as a result of a recent infarction, causing a back-up. Let's assume that the **myocardial infarction**[2] (MI) was left-sided, then the left side of the heart would not be able to move blood away from the lungs as quickly as the right side of the heart supplies blood to the lungs, causing a back-up to occur in the lungs, a condition referred to as acute pulmonary edema. At this point, the patient would present with respiratory distress and a detailed physical examination (PE) would reveal **rales** upon **auscultation** of the lungs. The extent of the rales would be dependent upon the progression of the process. In its later stages, the rales would include the upper lobes. Left unattended, pulmonary **hypertension** would develop, where the blood pressure in the pulmonary artery carrying blood from the right side of the heart to the lungs increases ultimately causing the right side of the heart to fail, and the back-up continues through the right side of the heart into systemic circulation. When that occurs the patient additionally presents with dependent **edema**. The extent of the edema is again dependent on the progression of the congestive heart failure. In its later stages the edema may include a portion of the patient's **calf**. The Advanced Life Support treatment of this patient will include using drugs to move fluid away from the heart and increase the strength of the heart beat, in order to break the **congestion** in, and around, the heart, and return the blood to normal circulation. Because of the increased pressure in the lungs, it is very possible that, in addition to the rales, this patient may also present with a pink frothy sputum. The increased blood pressure in the lungs can actually force microscopic amounts of blood across the **alveoli** into the respiratory system. It is that fluid in the lungs that causes the rales, and in the later stages, can mix with, and be coughed up as, pink frothy sputum.

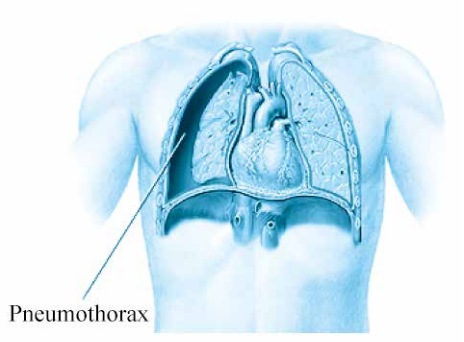
Chronic Obstructive Pulmonary Diseases (COPD)

③ This is a classification of diseases, including chronic **bronchitis** and **emphysema**. Through the repeated irritation of the airways, as a result of chronic bronchitis, and a narrowing of those airways, as a result of mucus build-up secondary to the irritation, total **expiration** of air from the lungs is hampered. Because **inhalation** is an active process, and **exhalation** a passive one, it is easier for the patient to force air past the partial obstruction of the lower airway during inhalation, but a **retention** of air in the alveolus results when the patient is unable to force the air back out past the same partial obstruction. When the patient actively inhales again, the alveolus is **inflated**, again, and only partial **deflated**, again. Over a period of time, the alveolus is blown up like a balloon, and each subsequent breath becomes less effective in that particular part of the lungs. The patient begins retaining carbon dioxide in these little balloons. That CO_2 retention expresses itself as a pink appearance in this patient. The active process of inhalation is accomplished by creating a positive pressure in the upper airway with a diminished pressure at the alveolar level. Patients with chronic bronchitis have learned through necessity that by maintaining some positive pressure in the upper airway, during exhalation,

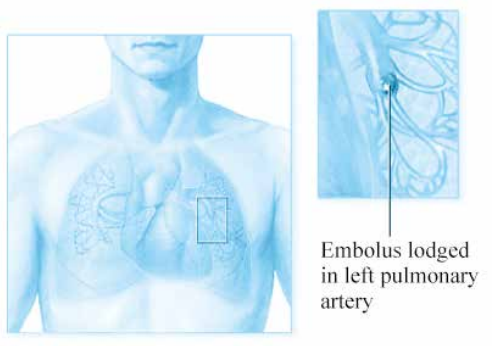
more complete exhalation is facilitated. Consequently, they exhale through **pursed** lips. This creates a condition called, positive end expiratory pressure (PEEP)[3]. Due to their practice of pursed lip breathing, and their pink appearance, these patients have been **dubbed** Pink Puffers. As time progresses, those little balloons of carbon dioxide, start to burst, giving rise to the second stage of COPD called emphysema. Emphysema has two effects in the lungs. First, as a result of all the stretching that has occurred in the alveoli, there has been a loss of elasticity in the lung tissue. And second, because of the loss of elasticity, some alveoli actually burst. As the disease process continues and more and more alveoli rupture, the effective surface area of the lung is decreased, and the lung's ability to absorb oxygen is diminished and the patient takes on a cyanotic appearance. Also, as a result of the change in lung shape (because at this point in the process most of the alveoli are hyperinflated), the shape of the chest has also been altered and the patient has a barrel chest appearance. Because of their puffed-up (barrel) appearance, and their **cyanotic** complexion, they are referred to as Blue Bloaters. It has been suggested that patients with COPD will stop breathing when administered oxygen because due to their carbon dioxide retention, their brains initiate a respiratory cycle using the **Hypoxic** Drive, and if they are flooded with oxygen the hypoxic drive will remain satisfied and not initiate the next respiratory cycle. It all sounds good on paper, but the reality is that it will take quite some time, probably more time than it takes to get to the hospital, for the hypoxic drive to be completely satisfied.

Pneumothorax

4 Pneumothorax refers to the presence of air between the outside of the lung and the inside of the chest wall, in an area called the **pleural** cavity, normally the result of **trauma**. The amount of air present will determine the severity of the **pneumothorax** and the amount of lung tissue that has collapsed, which will, in turn, determine the degree of dyspnea experienced by the patient. The source of the air in the pleural cavity can be external or internal, a hole in the chest wall or a hole in the lungs. If from a hole in the lungs, the hole may be secondary to some disease process without trauma and in such cases the pneumothorax is referred to as a spontaneous pneumothorax. The hole, whether internal or external, may have a **flap** of tissue attached to its **perimeter**, creating a valve that will permit the movement of air in only one direction. This may lead to a condition called tension pneumothorax, an immediate life threatening condition. Tension pneumothorax at its most threatening stage, is indicated by tracheal shift, as the tension pushes the lungs to one side or the other and the lungs drag the trachea over to the same side. A life threat is created when the **mediastinum** is also dragged to one side, which shifts the heart and may cause a **crimp** in the aorta and/or the vena cava, disrupting blood flow to or from the heart. Patients with pneumothorax will complain of mild to severe dyspnea, depending on the amount of collapsed lung tissue, with either a gradual or sudden onset, depending on the size of the hole. Breath sounds will either be diminished or absent over the site of the pneumothorax. For any patient with suspect pneumothorax, be alert to any change in **tracheal** position.



Pulmonary Embolism



5 An **embolus** is an obstruction in the circulatory system that interrupts blood flow. A pulmonary embolus is an obstruction (interruption) of blood flow to the lungs. Pulmonary **Embolism** is a process where a blood clot (thrombus) breaks loose from its origin, usually the site of a deep vein **thrombosis** in the leg, and becomes an embolus. This traveling thrombus (embolus) makes its way through the vena cava to the right side of the heart, and is immediately pumped out of the heart to the lungs through the pulmonary artery. This artery becomes smaller and smaller until the embolus is eventually **lodged** in place and interrupts the blood flow to the lungs. The patient reports a very sudden onset of dyspnea and acute pleuritic pain. In this case, cyanosis, and/or tachypnea may be observed.

Hyperventilation syndrome

6 Hyperventilation is a condition resulting in blood chemistry where arterial carbon dioxide levels fall below normal. It can be the result of fast shallow breathing (tachypnea) as might be the case in aspirin overdose, or slow deep breathing (bradypnea) as might be presented in some type of head injury. It is usually caused by some disease process, and as such, is to be considered an indicator of some major, life-threatening illness. Hyperventilation Syndrome occurs in the absence of any other associated disease process and is usually the result of some psychological influence. The patient usually presents tachypneic, and reports dyspnea, in spite of tachypnea. This patient should be treated with high-concentration oxygen, as with any other patient in respiratory distress. By encouraging the patient to breathe “normally”, the psychological trigger may be able to be broken, and hyper-**oxygenated** air, inhaled and exhaled normally during a hyperventilation syndrome event, will not otherwise exacerbate the syndrome condition.

7 There are several other medical conditions that may present as dyspnea, such as the common cold, **pneumonia**, **croup** — an inflammation of the lining of the larynx, typically seen in children under 3 years of age, **epiglottitis** — a bacterial infection of the epiglottis that can produce moderate to severe swelling.

8 As with any disease process, the origin of the process and the potential danger to self, presented by the disease, should be identified. Appropriate Personal Protective Equipment (PPE)[4] needs to be employed with every patient, and when the patient is experiencing some type of respiratory problem, it needs to be aware that the process may have been transmitted by some airborne pathogen. Act appropriately. It is crucial to always remember that re-establishment of adequate arterial oxygen tension and removals of excessive CO_2 are the overriding aims of the immediate treatment of patients with severe respiratory distress. The major ways in which to achieve this aim, regardless of the underlying cause of distress, are establishing a patent airway, instituting or assisting ventilation, and maintaining an adequate oxygen tension, by administration of supplemental oxygen, to maximize oxygen delivery.

New Words and Phrases

myocardial /ˌmaɪəʊˈkɑːdɪəl/ *a.*	of or relating to the middle muscular layer of the heart wall 心肌的
infarction /ɪnˈfɑːkʃ(ə)n/ *n.*	an area of tissue death due to a local lack of oxygen 梗塞
rale /rɑːl/ *n.*	an abnormal respiratory sound characterized by fine crackles 罗音，水泡音
auscultation /ˌɔːskəlˈteɪʃən/ *n.*	the act of listening for sounds made by internal organs, such as the heart and lungs 听诊
hypertension /ˌhaɪpəˈtenʃən/ *n.*	arterial disease in which chronic high blood pressure is the primary symptom 高血压
edema /ɪˈdiːmə/ *n.*	an excessive accumulation of serous fluid in tissue spaces or a body cavity 浮肿，水肿
calf /kɑːf/ *n.*	the fleshy muscular back part of the human leg between the knee and ankle 小腿肚
congestion /kənˈdʒestʃən/ *n.*	excessive accumulation of blood or other fluid in a body part 充血，阻塞
alveolus /ælˈvɪələs/ *n.*	(*pl.* **alveoli** /ælˈvɪəlaɪ/) a tiny, thin-walled, capillary-rich sac in the lungs 肺泡
bronchitis /brɒŋˈkaɪtɪs/ *n.*	chronic or acute inflammation of the mucous membrane of the bronchial tubes 支气管炎
emphysema /ˌemfɪˈsiːmə/ *n.*	a pathological condition of the lungs marked by an abnormal increase in the size of the air spaces 肺气肿
expiration /ˌekspəˈreɪʃən/ *n.*	the act of breathing out 呼气
inhalation /ˌɪnhəˈleɪʃən/ *n.*	the drawing of air or other substances into the lungs 吸气
exhalation /eksəˈleɪʃ(ə)n/ *n.*	the act of breathing out 呼气
retention /rɪˈtenʃən/ *n.*	the process of holding back or keeping in position 潴留，滞留
inflate /ɪnˈfleɪt/ *v.*	to fill with gas or air, blow up 充气，膨胀
deflate /dɪˈfleɪt/ *v.*	to release contained air or gas 放气，缩小
purse /pɜːs/ *v.*	to gather or contract (the lips or brow) into wrinkles or folds 皱起，撅起
dub /dʌb/ *v.*	to give a name to playfully 把……称为
cyanotic /ˌsaɪəˈnɒtɪk/ *a.*	marked by bluish discoloration of the skin due to a lack of oxygen in the blood 发绀的，青紫的
hypoxic /haɪˈpɒksɪk/ *a.*	deficient in the amount of oxygen reaching body tissues 含氧量低的
pleural /ˈplʊərəl/ *a.*	of or pertaining to a thin serous membrane that envelops each lung and folds back to make a lining for the chest cavity 肋膜的，胸膜的
trauma /ˈtrɔːmə/ *n.*	a serious injury or shock to the body 创伤，外伤

pneumothorax /ˌnjuːmə(ʊ)'θɔːræks/ *n.*	abnormal presence of air in the pleural cavity resulting in the collapse of the lung 气胸
flap /flæp/ *n.*	a movable piece of tissue partly connected to the body（皮）瓣
perimeter /pə'rɪmɪtə/ *n.*	the boundary line or the area immediately inside the boundary 周边，边缘
mediastinum /ˌmiːdɪə'staɪnəm/ *n.*	the region between the pleural sacs, containing the heart and all of the thoracic viscera except the lungs（胸腔）纵隔
crimp /krɪmp/ *n.*	an angular or rounded shape made by folding 皱褶
tracheal /trə'kiːəl/ *a.*	relating to a cartilaginous and membranous tube extending from the lower end of the larynx to its division into two bronchi 气管的
embolus /'embələs/ *n.*	a mass, such as an air bubble, a detached blood clot, or a foreign body, that travels through the bloodstream and lodges so as to obstruct or occlude a blood vessel 栓塞物
embolism /'embəlɪz(ə)m/ *n.*	obstruction or occlusion of a blood vessel by an embolus 栓塞形成
thrombus /'θrɒmbəs/ *n.*	(*pl.* **thrombi** /'θrɒmbaɪ/) a blood clot formed within a blood vessel and remaining attached to its place of origin 血栓
lodge /lɒdʒ/ *v.*	to fix, force, or implant 停留
oxygenate /'ɒksɪdʒəneɪt/ *v.*	to treat, combine, or infuse with oxygen 以氧处理，氧化
pneumonia /njʊ(ː)'məʊnɪə/ *n.*	an acute or chronic disease marked by inflammation of the lungs 肺炎
croup /kruːp/ *n.*	spasmodic laryngitis: harsh coughing and hoarseness and fever and difficult breathing 喘鸣性喉痉挛
epiglottitis /ˌepɪglɒ'taɪtɪs/ *n.*	an infection of the epiglottis, which can lead to severe airway obstruction 会厌炎

▶ Word Building

Stems/Affixes	Meaning	Examples
tachy-	too rapid	tachycardia, tachyarrhythmia, tachypnea, tachyuria
brady-	too slow	bradycardia, bradyrhythmia, bradypnea, bradygenesis
-pnea	breathing	dyspnea, orthopnea, polypnea
pneumo-	lung, air	pneumonia, pneumoconiosis, pneumoturia
-itis	inflammation	gastritis, cholecystitis, nephritis, dermatitis
dys-	diseased, abnormal	dysfunction, dysplasia, dysmenorrhea
hyper-	above, high	hypertension, hypercalcemia, hypercrine
hypo-	below, low	hypotension, hypoxic, hypothermia, hypoplasia

Notes

1. **Respiratory distress** is a condition where patients with lung disease are not able to get enough oxygen. It can occur in a great many conditions, including those arising in (lungs, bronchi, bronchioles, muscles, nerves, or brain). Acute respiratory distress syndrome (ARDS) is an uncommon critical condition where the lungs fill with fluid and inflammatory cells. This may occur following major trauma, bone marrow transplantation, or after a variety of illnesses.
2. **Myocardial infarction** is an occlusion or blockage of arteries supplying the muscles of the heart, resulting in injury or necrosis of the heart muscle (heart attack).
3. **Positive end expiratory pressure** (PEEP) is the pressure in the lungs (alveolar pressure) above atmospheric pressure (the pressure outside of the body) that exists at the end of expiration. The two types of PEEP are extrinsic PEEP (PEEP applied by a ventilator) and intrinsic PEEP (PEEP caused by a non-complete exhalation).
4. **Personal Protective Equipment** (PPE) is specialized clothing or equipment worn by an employee for protection against infectious materials, including gloves, gowns, shoe covers, head covers, masks, respirators, eye protection, face shields, and goggles. PPE prevents contact with an infectious agent or body fluid that may contain an infectious agent, by creating a barrier between the potential infectious material and the healthcare worker.

Post-reading Activities

Ⅰ. Decide whether the following statements are True or False.

1. In hyperventilation, the level of carbon dioxide in the blood is increased.
2. Cyanosis can be seen in pulmonary embolism.
3. When pneumothorax occurs, there are no breath sounds heard.
4. Patients with chronic obstructive pulmonary disease should be provided with oxygen.
5. The increased pressure in the lungs may lead to frothy sputum.

Ⅱ. Choose the best answer.

1. “Dependent edema” means the edema depends on the function of _____.

   A. the left lung　　B. the left heart

   C. the right lung　　D. the right heart

2. Patients with chronic obstructive pulmonary diseases keep pursed lip breathing in order to _____ in the upper airway.

   A. increase the pressure　　B. reduce the pressure

   C. maintain the positive pressure　　D. maintain the negative pressure

3. The retention of air in the alveoli will result in _____.

   A. obstruction of the lower airway　　B. obstruction of the upper airway

C. increase in oxygen in the alveoli　　D. increase in carbon dioxide in the alveoli

4. The results of tension pneumothorax do not include _____.

A. dragging the mediastinum to one side　　B. dragging the lungs to one side

C. dragging the heart to one side　　D. dragging the aorta to one side

5. Hyperventilation Syndrome is caused by the following factors except _____.

A. overdose aspirin　　B. lung injury　　C. head injury　　D. psychological factors

III. Answer the following questions.

1. What are the main causes for respiratory distress?
2. How does left-sided heart failure result in respiratory distress?
3. Why is it difficult to breathe out the air in the chronic obstructive pulmonary disease?
4. Why is it difficult to breathe when there is a hole in the chest wall or the lungs?
5. Where does the embolus usually come from when there is pulmonary embolism?

IV. Choose the proper words from the word bank. Change the form where necessary.

oxygenate	bradypnea	emphysema	edema	congestion
bronchitis	pneumothorax	lodge	pneumonia	dyspnea

1. Lung problems that can affect athletes are asthma, pulmonary embolism, pneumonia and _____.
2. The bronchi supply air and pulmonary arteries supply blood to the lungs. Together they take in air from the atmosphere, _____ the blood, and excrete the carbon dioxide back out of the body.
3. Specifically, COPD refers to chronic bronchitis and _____.
4. Everyone with flu or lung _____ faces this coughing problem even after the germs have been killed.
5. Through these metabolic processes the enzymes can affect how fast a swelling or an _____ of injured tissue is reduced.
6. Cardiac _____ results from edema in bronchiolar walls and stiffening of the lung due to parenchymal or alveolar edema, which interfere with air flow.
7. When flu causes _____, it can damage cells deep in the lungs, opening a portal for bacteria.
8. Smoking is the number one cause of preventable deaths in the United States and other developed countries, causing lung cancer, heart disease, and chronic _____.

V. Translate the following sentences into Chinese.

1. Left unattended, pulmonary hypertension would develop, where the blood pressure in the pulmonary artery carrying blood from the right side of the heart to the lungs increases ultimately causing the right side of the heart to fail, and the back-up continues through the right side of the heart into systemic circulation.
2. The amount of air present will determine the severity of the pneumothorax and the amount of lung tissue that has collapsed, which will, in turn, determine the degree of dyspnea experienced by the patient.
3. By encouraging the patient to breathe normally, the psychological trigger may be able to be broken, and hyper-oxygenated air, inhaled and exhaled normally during a hyperventilation syndrome event, will not otherwise exacerbate the syndrome condition.

4. Patients with pneumothorax will complain of mild to severe dyspnea, depending on the amount of collapsed lung tissue, with either a gradual or sudden onset, depending on the size of the hole.
5. Let's assume that the myocardial infarction was left-sided, then the left side of the heart would not be able to move blood away from the lungs as quickly as the right side of the heart supplies blood to the lungs, causing a back-up to occur in the lungs, a condition referred to as acute pulmonary edema.

Passage B
Respiratory Failure

Introduction

1 Respiratory failure is when normal breathing stops or becomes so faint that oxygen intake is not enough to keep the body functioning. "Artificial respiration" forces air to flow in and out of the lungs when natural breathing is insufficient or stops.

Causes

2 There are several possible causes for respiratory failure. The most common causes are: 1) the tongue may drop back into the throat and interfere with one's ability to breathe; 2) the tissues in the throat may swell and cause the air passages to narrow; 3) a foreign object may become lodged in the throat passage; and 4) inhaling stale air or toxic gases may diminish one's ability to get sufficient oxygen. The last two causes are particularly prevalent in children, who may stick objects into their mouths and accidentally swallow them, place plastic bags over their heads, or crawl into discarded refrigerators, which, because of this possibility, should always have the doors removed before being disposed of. Other causes include **electrocution**, drowning, shock, **suffocation**, heart disease, lung disease, or drug overdoses of **narcotics** that depress the breathing capacity, such as opium, morphine, **codeine**, **barbiturates**, or alcohol.

Symptoms

3 No matter what the cause of respiratory failure is, the symptoms will be the same. The victim's tongue, lips, and fingernail beds become blue; he or she will lose consciousness, and the pupils of the eyes will become dilated.

Treatment

Artificial Respiration

4 Artificial respiration is the forced introduction of air into the lungs of someone who has stopped breathing or whose breathing is inadequate. It may be administered by one of two techniques: by the mouth-to-mouth method or by the mouth-to-nose method. It may also be given with the use of ventilating equipment, in which case it will be administered by trained personnel. Artificial respiration should be started as soon as possible after someone has stopped breathing; delay in breathing for more than six minutes can cause death. When someone has stopped breathing, there is no rise-and-fall movement of the chest or abdomen, the face becomes blue-gray, and no exhaled breath can be felt. When there are no signs of breathing, it is likely that the heart has stopped beating. At this point, it is probably easier to find the **carotid** pulse than to search for that in the leg or wrist. To check the carotid pulse, find the Adam's apple

with the tips of your index and middle fingers, and then slide them into the groove between the throat structure and the large muscle in the side of the neck. If there is no pulse, cardiac **compressions** should be carried out in conjunction with artificial respiration. When breathing is weak and shallow, movement of the chest is slight and hardly any breath can be felt. If breathing is not restored, the brain is deprived of oxygen, causing permanent brain damage or death.

5 Mouth-to-mouth **resuscitation** is the simplest and most effective method of introducing air into the victim's lungs. The method is safe to use in any situation when a person's breathing is weak, shallow, or labored. The following steps could be taken: 1) Send for medical help, but start resuscitation immediately — do not waste time loosening clothing around the neck unless there is obvious **strangulation**. Lay the victim on his or her back on a firm, rigid surface. Quickly clear the mouth and airway of any foreign material with your fingers. 2) If there does not appear to be any neck injury, gently tilt the victim's head backward and maintain it in the midline by placing one hand under the back of the neck and lifting upward. Place the heel of the other hand on the victim's forehead and press downward so that the chin is elevated. 3) Using the hand that is placed on the victim's forehead, pinch the victim's **nostrils**, using your thumb and index finger. Take a deep breath. Place your open mouth tightly around the victim's open mouth and blow air from your lungs into the victim's lungs. Stop blowing when the victim's chest is expanded. 4) Remove your mouth and turn your head toward the victim's chest. Listen for air leaving his or her lungs and watch the chest fall. Give four quick breaths, taking a deep breath between each one. Continue at the rate of 12 breaths per minute, until you see the victim beginning to breathe on his or her own.

6 If the victim has a facial injury, it may be difficult for you to breathe into his or her mouth. In such cases, follow steps 1 and 2 above. Remove your hand from the back of the victim's neck and close his or her mouth by lifting the chin. Take a deep breath and seal your mouth around the victim's nose. Remove your mouth and hold the victim's mouth open with your hand, so that air can escape. Repeat as for mouth-to-mouth resuscitation every five seconds. Resuscitating a baby or young child is basically the same as the method of resuscitating an adult, except that you will find it easier to seal your mouth over both the mouth and nose of the child. Do not tip the child's head back very far, because a child's neck and airway are more fragile than an adult's. Blow gentle breaths of air into the lungs, one breath every two to three seconds — 20 to 30 breaths per minute — until the child's chest starts to rise.

Cardiopulmonary Resuscitation

7 Cardiopulmonary resuscitation (CPR)[1] is the administration of the lifesaving measures of external cardiac compression **massage** and mouth-to-mouth resuscitation to someone collapsing with a cardiac **arrest**, cessation of effective heart beat. It is vital to restore the circulation of oxygen-carrying blood to the brain as quickly as possible because permanent brain damage is likely if the brain is starved of oxygen for more than three to four minutes.

8 Before starting CPR, it is important to establish that the victim has indeed suffered a cardiac arrest and has not simply fainted. The person will be unresponsive and have little or no breathing motion. Skin color will be pale or blue-gray, especially around the lips. The person's heart will not seem to be beating. No pulse will be felt in the wrist or neck, and no heart beat will be heard when the chest is listened to.

If the person is breathing, no matter how slowly, then the heart will probably still be beating, even if no pulse can be detected. A normal pulse rate is 70—90 beats per minute for adults and 90—110 for small children.

9 Do not use your thumb to feel for pulse, because this finger has a pulse of its own, which may be confused with the victim's pulse. The following steps could be taken: 1) First make sure the airway is clear. Then look and listen for signs of breathing. Listen for air escaping and feel for air flow. Feel for the pulse. 2) If the victim is breathing, place him or her in the "recovery position." If not breathing, place the victim flat on his or her back on a firm, hard surface, with the head at the same level as the heart, and start mouth-to-mouth resuscitation. 3) Pinch the victim's nose shut, take a breath, seal your lips around the mouth, and blow. Your breath contains enough oxygen for the victim's needs. 4) If breathing does not restart and you cannot detect a pulse or heart beat, start cardiac compression. It is important that you check the victim's carotid pulse for 5 to 10 seconds before you start CPR, because it is dangerous to perform chest compressions if the heart is beating. Kneel beside the victim, facing his or her chest with your knees against the victim; then lean over the chest, press down and come up at a steady pace. 5) Position the heel of one hand over the center of the **breastbone**. The heel of the second hand is placed over the bottom hand. **Interlock** the fingers. 6) It is vital to apply pressure at the correct point — the lower part of the breastbone. The rescuer's shoulders should line up directly over the victim's breastbone, with the arms straightened at the elbows. 7) Using a stiff-arm technique, the breastbone is compressed 1 and 1/2 to 2 inches and then released. Using a smooth motion, the compression phase should equal the relaxation phase, with a rate of 60 compressions per minute. 8) If two rescuers are working together, the second rescuer should give the victim mouth-to-mouth resuscitation, forcing a breath into him or her every 5 chest compressions. The artificial breath does not have to be timed precisely between compressions. If a single person is performing the rescue, he or she should alternate 10 chest compressions with two breaths.

10 Chest compressions in infants and small children can be performed with a stabilizing hand on the back, and the compressing hand or fingers on the chest. Care should be taken to provide a firm compression without separating the ribs from the breastbone. The rate of chest compressions for a child is 80—100 per minute, with 20—25 breaths per minute. The rescuer should continue to administer artificial respiration and chest compressions until help arrives or until the rescuer becomes too tired to continue. During resuscitation, the rescuer(s) should check every few minutes for the return of a pulse and/or spontaneous breathing.

New Words and Phrases

electrocution /ɪˌlektrəˈkjuːʃən/ *n.*	killing by electric shock 电刑
suffocation /ˌsʌfəˈkeɪʃən/ *n.*	killing by depriving of oxygen 窒息
narcotic /nɑːˈkɒtɪk/ *n.*	a drug which diminishes the awareness of sensory impulses, especially pain 麻醉剂

codeine /'kəʊdiːn/ *n.*	derivative of opium 可待因
barbiturate /bɑː'bɪtjʊrət/ *n.*	a medicine that acts on the central nervous system and cause drowsiness and can control seizures 巴比妥酸盐
carotid /kə'rɒtɪd/ *a.*	of or relating to either of the two major arteries supplying blood to the head and neck 颈动脉的
compression /kəm'preʃ(ə)n/ *n.*	applying pressure 压迫
resuscitation /rɪˌsʌsɪ'teɪʃən/ *n.*	the act of reviving a person and returning them to consciousness 复苏
strangulation /strægjʊ'leɪʃ(ə)n/ *n.*	killing by constricting the windpipe 绞死，勒死
nostril /'nɒstrɪl/ *n.*	either one of the two external openings to the nasal cavity in the nose 鼻孔
massage /'mæsɑːʒ/ *n.*	kneading and rubbing parts of the body to increase circulation and promote relaxation 按摩；揉
arrest /ə'rest/ *v.*	to cause to stop （心脏）骤停
breastbone /'bres(t)bəʊn/ *n.*	the flat part of the skeleton that articulates with the clavicles and the first seven pairs of ribs 胸骨
interlock /ˌɪntə'lɒk/ *v.*	to unite or join closely as by hooking 交锁，互锁

Notes

1. **Cardiopulmonary resuscitation (CPR)** is the name for a number of procedures that should be applied if a person stop breathing, or if they suffered from cardiac arrest. These measures are performed to keep up an artificial circulation, so that vital organs still get oxygen. CPR does not start a person's heart again, but it can keep the blood (which carries oxygen) flowing around the body long enough for proper emergency treatment to be given. Time is a very important factor. Each minute that passes before the onset of the CPR measures lowers the chance of survival by about ten percent. In the case where the CPR starts within the first three to five minutes, and a defibrillator is available, the chance of survival can be as high as 50, or even 75%. In European countries, emergency services take about eight minutes or more to arrive, once they have been alerted. A victim's survival therefore largely depends on the presence and quick action of other people present. A quick call to emergency services, and a quick start of basic CPR, especially fibrillation can double to triple the chance of survival with adults, and children.

Post-reading Activities

Ⅰ. Choose the best answer.

1. The most common causes for respiratory failure do not include _____.

A. swelling throat
B. obstructed throat by foreign objects
C. blocked throat by dropping tongue
D. throat attacked by toxic gas

2. Artificial respiration does not involve _____.
A. mouth-to-mouth
B. mouth-to-nose
C. chest compression
D. ventilating equipment

3. The most effective way to check if there is heart beating is to search for pulse in the _____.
A. leg
B. neck
C. wrist
D. chest

4. Mouth-to-mouth respiration should be given every _____ chest compressions for adults if there is only one rescuer.
A. 5
B. 10
C. 20
D. 60

5. Chest compression should be started when _____.
A. the lips become blue or gray
B. there is no air escaping from the nose
C. there is no pulse felt
D. there is no rise-and-fall movements of the chest or abdomen

Ⅱ. Translate the following sentences into Chinese.

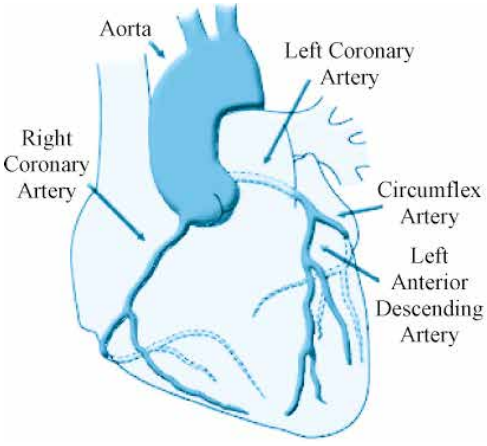
1. Respiratory failure is when normal breathing stops or becomes so faint that oxygen intake is not enough to keep the body functioning.
2. Artificial respiration is the forced introduction of air into the lungs of someone who has stopped breathing or whose breathing is inadequate.
3. It is vital to restore the circulation of oxygen-carrying blood to the brain as quickly as possible because permanent brain damage is likely if the brain is starved of oxygen for more than three to four minutes.
4. If two rescuers are working together, the second rescuer should give the victim mouth-to-mouth resuscitation, forcing a breath into him or her every 5 chest compressions.
5. The rescuer should continue to administer artificial respiration and chest compressions until help arrives or until the rescuer becomes too tired to continue.

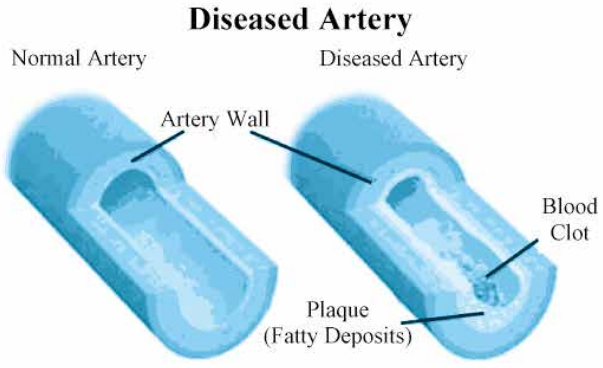
Unit 2

Passage A
Coronary Artery Disease

Pre-reading Activities

Ⅰ. Look at the following diagrams. Talk about the blood circulation of the heart and problem(s) which may happen in the blood vessels of the heart.





Ⅱ. Try to understand the following terms before your reading.

coronary /ˈkɒrənərɪ/ *a.* surrounding like a crown (especially of the blood vessels surrounding the heart) 冠状的

atherosclerosis /ˌæθərəʊsklɪəˈrəʊsɪs/ *n.* a form of arteriosclerosis characterized by the deposition of atheromatous plaques containing cholesterol and lipids on the innermost layer of the walls of large and medium-sized arteries 动脉粥样硬化

plaque /plɑːk/ *n.* a deposit of fatty material on the inner lining of an arterial wall, characteristic of atherosclerosis 粥样硬化斑

blockage /ˈblɒkɪdʒ/ *n.* an obstruction 堵塞

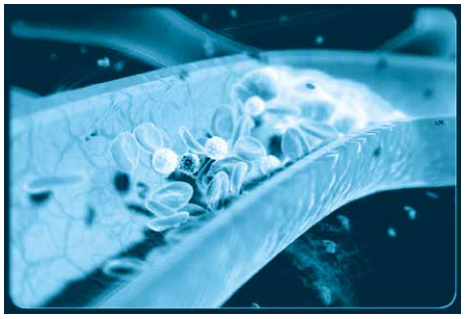
Text

Introduction

1 The coronary arteries supply the heart with blood, oxygen and nutrients. When blood flow through the coronary arteries becomes obstructed, it is known as coronary artery disease. Coronary artery disease is caused by the gradual buildup of fatty deposits in the coronary arteries — atherosclerosis. As the deposits slowly narrow the coronary arteries, the heart receives less blood. Eventually, diminished blood flow may cause chest pain — **angina**, shortness of breath or other symptoms. A complete blockage can cause a heart attack. Since coronary artery disease often develops over decades, it can go virtually unnoticed until it produces a heart attack.

Causes

2 Coronary artery disease is thought to begin with damage or injury to the inner layer of a coronary artery, sometimes as early as childhood. The damage may be caused by various factors, including smoking, high blood pressure, high **cholesterol**, certain diseases, such as **diabetes**, and radiation therapy to the chest, as used for certain types of cancer. Once the inner wall of an artery is damaged, fatty deposits — plaques — accumulate. If the surface of these fatty deposits breaks or **ruptures**, blood cells called platelets will clump at the site to try to repair the artery. This clump can block the artery, leading to a heart attack.



Risk Factors

3 Men are generally at greater risk of coronary artery disease than women. However, the risk for women increases after **menopause**. A family history of heart disease and simply getting older increases the risk as well. Other risk factors for coronary artery disease include smoking, high blood pressure, high cholesterol, diabetes, **obesity**, physical inactivity, stress and anger.

4 Risk factors often occur in **clusters** and may feed one another, such as obesity leading to diabetes and high blood pressure. When grouped together, certain risk factors may lead to an even greater risk of coronary artery disease. For example, metabolic syndrome — a cluster of conditions that includes elevated blood pressure, high **triglycerides**, elevated insulin levels and excess body fat around the waist — greatly increases the risk of all types of heart disease. Sometimes coronary artery disease develops without any classic risk factors.

5 Researchers are studying other possible factors, including C-reactive protein (CRP)[1], **homocysteine**, **fibrinogen**, and **lipoprotein**. The liver produces CRP in response to injury or infection. CRP is also produced by muscle cells within the coronary arteries, a general sign of inflammation playing a central role in atherosclerosis. Homocysteine is an amino acid the body uses to make protein and to build and maintain tissue. But excessive levels of homocysteine may increase the risk of coronary artery disease and other **cardiovascular** conditions. Fibrinogen is a protein in the blood that plays a central role in blood clotting. But too much may promote excessive clumping of platelets, the type of blood cell largely responsible for **clotting**. That can cause a clot to form in an artery, leading to a heart attack or stroke.

Fibrinogen may also be an indicator of the inflammation that accompanies atherosclerosis.

6 Lipoprotein(a) forms when a low-density lipoprotein (LDL)[2] cholesterol particle attaches to a specific protein. The protein that carries lipoprotein(a) may disrupt the body's ability to dissolve blood clots. High levels of lipoprotein(a) may be associated with an increased risk of cardiovascular disease, including coronary artery disease and heart attack.

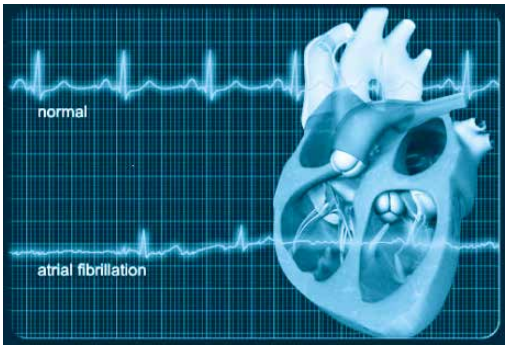
Signs and Symptoms

7 If the coronary arteries become narrowed, they cannot supply enough oxygenated blood to the heart — especially when it is beating hard, such as during physical activity. At first, the restricted blood flow may not cause any symptoms. As the fatty deposits continue to accumulate in the coronary arteries, however, there may be chest pain, shortness of breath and heart attack.

8 Chest pain refers to the feeling of pressure or tightness in the chest, as if someone were standing on the chest. The pain is usually triggered by physical or emotional stress. It typically goes away within minutes after stopping the stressful activity. **Atypical** chest pain, more common in women, may be fleeting or sharp and noticed in the abdomen, back or arm. If the heart cannot pump enough blood to meet the body's needs, there may be symptoms of heart failure — shortness of breath, extreme fatigue with exertion, and swelling in the feet and ankles. If a coronary artery becomes completely blocked, there is a heart attack. The classic symptoms of a heart attack include **crushing** pain in the chest, pain in the shoulder or arm, and shortness of breath. Women are somewhat more likely than men to experience other warning signs of a heart attack, including nausea and back or jaw pain. Sometimes a heart attack occurs without any apparent signs or symptoms.

Diagnosis

9 The medical history, physical examination and routine blood tests may be **conducive** to the diagnosis. However, one or more of the following diagnostic tests may be suggested.



10 An **electrocardiogram** (ECG) records electrical signals as they travel through the heart. An ECG can often reveal evidence of a previous heart attack or one that's in progress. In other cases, Holter monitoring may be recommended. With this type of ECG, the patients wear a portable monitor for 24 hours while doing the normal activities. Certain abnormalities may indicate inadequate blood flow to the heart.

11 An **echocardiogram** uses sound waves to produce images of the heart. During an echocardiogram, it will be determined whether all parts of the heart wall are contributing normally to the heart's pumping activity. Parts that move weakly may have been damaged during a heart attack or be receiving too little oxygen. This may indicate coronary artery disease or various other conditions.

12 If the signs and symptoms occur most often during exercise, the patients may be required to walk on a **treadmill** or ride a stationary bike during an ECG. This is known as an exercise stress test. In other cases, medication to stimulate the heart may be used instead of exercise.

13 Some stress tests are done using an echocardiogram, which are known as stress echoes. For example,

an **ultrasound** may be performed before and after the exercise on a treadmill or bike. Or medications may be used to stimulate the heart during an echocardiogram. Another stress test known as a nuclear stress test helps measure blood flow to the heart muscle at rest and during stress. It is similar to a routine exercise stress test but with images in addition to an ECG. Trace amounts of **radioactive** material, such as **thallium**, are injected into the bloodstream. Special cameras can detect areas in the heart that receive less blood flow.

14 To view blood flow through the heart, a special dye may be injected into the arteries before a chest X-ray. This is known as an **angiogram**. The dye outlines narrow spots and blockages on the X-ray images. If there is a blockage that requires treatment, a balloon or **stent** can be used to improve the blood flow in the heart.

Complications

15 When the coronary arteries narrow, the heart may not receive enough blood when demand is greatest, particularly during physical activity. This can cause chest pain or shortness of breath. If a cholesterol plaque ruptures, complete blockage of the heart artery may trigger a heart attack.

16 The lack of blood flow to the heart during a heart attack leads to **irreversible** damage to the heart muscle. The amount of damage depends in part on how quickly treatment is provided. If the heart has been damaged and cannot pump enough blood to meet the body's needs, the patients may experience heart failure.

Prevention

17 Lifestyle changes can help prevent or slow down the progression of coronary artery disease. Smoking is a major risk factor for coronary artery disease. **Nicotine** constricts blood vessels and forces the heart to work harder, and carbon **monoxide** reduces oxygen in the blood and damages the lining of the blood vessels. Quitting smoking is the best way to reduce the risk of a heart attack. The blood pressure should be measured at least every two years. Normal blood pressure is below 120 **systolic**/80 **diastolic** as measured in millimeters of mercury (mmHg). A baseline cholesterol test should be determined in one's 20s and such test should be conducted at least every five years. Most people should aim for an LDL level below 130 mg/dL. If there is a very high risk for heart disease — if there is already a heart attack or diabetes, for example, an LDL level should be aimed below 70 mg/dL. In addition, if there is diabetes, tight blood sugar control can help reduce the risk of heart disease.

New Words and Phrases

angina /æn'dʒaɪnə/ *n.*	chest pain due to ischemia (a lack of blood, thus a lack of oxygen supply and waste removal) of the heart muscle, generally due to obstruction or spasm of the coronary arteries 心绞痛
cholesterol /kə'lestərəʊl/ *n.*	a white crystalline substance, $C_{27}H_{45}OH$, found in animal tissues and various foods, that is normally synthesized by the liver and is important as a constituent of cell membranes and a precursor to steroid hormones 胆固醇

diabetes /ˌdaɪə'biːtiːz/ *n.*	any of several metabolic disorders marked by excessive urination and persistent thirst 糖尿病
rupture /'rʌptʃə(r)/ *v.*	to separate or cause to separate abruptly 破裂
menopause /'menəpɔːz/ *n.*	the period marked by the natural and permanent cessation of menstruation, occurring usually between the ages of 45 and 55 绝经
obesity /əʊ'bɪsɪtɪ/ *n.*	the condition of being fat 肥胖（症）
cluster /'klʌstə/ *n.*	a group of the same or similar elements gathered or occurring closely together 群；簇
triglyceride /traɪ'glɪsəraɪd/ *n.*	a naturally occurring ester of three fatty acids and glycerol that is the chief constituent of fats and oils 甘油三酯
homocysteine /ˌhəʊmə'sɪstəˌɪn/ *n.*	an amino acid used normally by the body in cellular metabolism and the manufacture of proteins 高半胱氨酸
fibrinogen /faɪ'brɪnədʒ(ə)n/ *n.*	a protein in the blood plasma that is essential for the coagulation of blood 纤维蛋白原
lipoprotein /'lɪpə(ʊ)ˌprəʊtiːn/ *n.*	any of a group of conjugated proteins in which at least one of the components is a lipid 脂蛋白
cardiovascular /ˌkɑːdɪəʊ'væskjʊlə/ *n.*	of or pertaining to or involving the heart and blood vessels 心血管的
clot /klɒt/ *v.*	to cause to change from a liquid to a solid or thickened state 凝结
atypical /eɪ'tɪpɪkəl/ *a.*	not conforming to type; unusual or irregular 非典型的
crushing /'krʌʃɪŋ/ *a.*	physically or spiritually devastating 压榨性的
conducive /kən'djuːsɪv/ *a.*	helping to produce 有助于……的，有益于……的
electrocardiogram /ɪlektrəʊ'kɑːdɪəʊgræm/ *n.*	the curve recording the electrical currents associated with heart muscle activity 心电图
echocardiogram /'ekəʊ'kɑːdɪəʊgræm/ *n.*	an ultrasound image of the heart that demonstrates the size, motion, and composition of cardiac structures 超声心动图
treadmill /'tredmɪl/ *n.*	an exercise device consisting of a continuous moving belt on which a person can walk or jog while remaining in one place 跑步机
ultrasound /'ʌltrəˌsaʊnd/ *n.*	the use of ultrasonic waves for diagnostic or therapeutic purposes, specifically to image an internal body structure and monitor a developing fetus 超声波
radioactive /'reɪdɪəʊ'æktɪv/ *a.*	of, exhibiting, or caused by emission of a stream of particles or electromagnetic rays in nuclear decay 放射性的
thallium /'θælɪəm/ *n.*	a soft, malleable, highly toxic metallic element 铊（化学元素）

angiogram /'ændʒɪə(ʊ)græm/ *n.*	an X-ray of one or more blood vessels produced by injection of a radioactive contrast medium 血管、淋巴造影照片
stent /stent/ *n.*	a surgical implant used to keep an artery open 支架
irreversible /ˌɪrɪ'vɜːsəbl/ *a.*	impossible to turn around to the opposite direction 不可逆的
nicotine /'nɪkəti:n/ *n.*	a colorless, poisonous alkaloid, $C_{10}H_{14}N_2$, derived from the tobacco plant 尼古丁
monoxide /mə'nɒksaɪd/ *n.*	an oxide with each molecule containing one oxygen atom 一氧化物
systolic /sɪ'stɒlɪk/ *a.*	of or pertaining to contraction 收缩的
diastolic /ˌdaɪə'stɒlɪk/ *a.*	of or pertaining to relaxation 舒张的

Word Building

Stems/Affixes	Meaning	Examples
cardio-	heart	cardiovascular, cardiogenic, cardiograph, cardiomegaly
angio-	vessel	angiogram, angiocardiography, angiology, angioma
vaso-	vessel	vasodilatation, vasoconstriction, vasospasm
scler(o)-	hardening	atherosclerosis, sclerencephalia, scleroid, scleroma
meno-	period	menopause, menopad, menopathy, menorrhea
homo-	the same, high	homocysteine, homobiotin, homosexual, homotype
ultra-	beyond	ultrasound, ultrasonoscope, ultrafilter

Notes

1. **C-reactive protein (CRP):** one of the acute phase proteins that increase during systemic inflammation. It has been suggested that testing CRP levels in the blood may be an additional way to assess cardiovascular disease risk. A more sensitive CRP test, called a highly sensitive C-reactive protein assay, is available to determine heart disease risk.
2. **low-density lipoprotein (LDL):** a lipoprotein that transports cholesterol in the blood; composed of moderate amount of protein and a large amount of cholesterol; high levels are thought to be associated with increased risk of coronary heart disease and atherosclerosis. In contrast, there is high-density lipoprotein (HDL), a lipoprotein that transports cholesterol in the blood; composed of a high proportion of protein and relatively little cholesterol; high levels are thought to be associated with decreased risk of coronary heart disease and atherosclerosis.

Post-reading Activities

Ⅰ. Decide whether the following statements are True or False.

1. Risk factors can contribute to the formation of coronary artery disease together and then lead to a greater risk of the disease.
2. C-reactive protein produced in liver is a general sign of inflammation.
3. Electrocardiogram can reveal evidence of narrowed coronary artery.
4. The parts of the heart wall receiving little oxygen can be directly shown in the echocardiogram.
5. Stress tests could help to identify coronary artery disease.

Ⅱ. Choose the best answer.

1. When there is coronary artery disease, the coronary artery is _____.
   A. extended B. shortened C. enlarged D. narrowed
2. To view blood flow through the heart, _____ could be used.
   A. electrocardiogram B. echocardiogram C. stress tests D. angiogram
3. The most severe complication of coronary artery disease is _____.
   A. chest pain B. shortness of breath C. heart failure D. heart attack
4. The most important lifestyle change is _____ in terms of prevention of coronary artery disease.
   A. to quit drinking B. to quit smoking C. to take less sugar D. to take less fat
5. For people who have a heart attack or diabetes, the ideal level of low-density lipoprotein in blood should be _____ mg/dL.
   A. below 70 B. below 80 C. above 100 D. below 120

Ⅲ. Answer the following questions.

1. What is coronary artery disease?
2. What are the causes of coronary artery disease?
3. What are the risk factors for coronary artery disease?
4. What is the difference between typical and atypical chest pain?
5. What is helpful for diagnosis of coronary artery disease?

Ⅳ. Choose the proper words from the word bank. Change the form where necessary.

clot	angina	cardiovascular	obstruct	atherosclerosis
electrocardiogram	irreversible	diastolics	systolic	blockage

1. As they grow, adenocarcinomas can _____ the ducts from the liver and cause severe back pain.
2. Alzheimer's disease is a progressive, degenerative and _____ brain disorder that causes intellectual impairment, disorientation and eventually death.
3. About 1.4 million people in England suffer from chest pain, known as _____, and about 110,000 people die from heart disease every year.
4. Doctors were initially unsure what had happened to him but, after an MRI scan and an _____, he was diagnosed as having been struck by lightning.
5. Haemophilia is a rare inherited bleeding disorder in which blood does not _____ normally.
6. Systolic blood pressure is the pressure while the heart is beating, and _____ is the pressure while