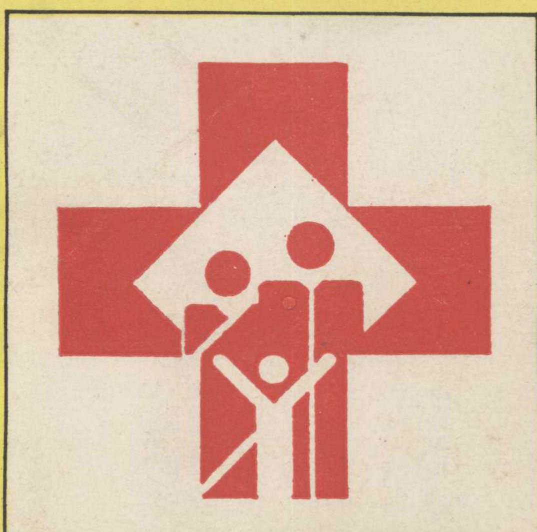
供医学院校

学生及医务人员使用

医用英语专业阅读

华仲乐 主编 王佩侠 审校

English For Medical Purpose



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医用英语专业阅读

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前　　言

近年来，尽管改革开放的形势对大学生的英语实际运用能力提出了更高的要求，但实际情况并不乐观。以医学院校学生阅读医学专业文章的能力来说，不少知情人士就正确地指出，整个形势呈滑坡状态。原因之一，是不少学生只重视应付考试的普通英语学习，忽视了获取实际能力的专业英语学习。而缺乏专业阅读能力的学生很难说已完成了大学阶段的英语学习任务，对今后的工作也将留下隐患。针对这种情况，我们选编了这本《医用英语专业阅读》，以期为医学专业学生提供阅读材料，同时将专业阅读的问题提到与大学英语教学有关的各方人士面前。

要提高阅读，先决条件是要大量阅读。阅读量如果只是几篇课文，是无济于事的。为了切实打好基础，阅读的材料无须深奥，但面必须广。第二，将英语与相应专业结合的实际运用。在此阶段中，有必要对已学过的语言及语法知识有意识地加以注意、巩固和深化，从对语言的感性了解转入理性运用。第三，要注意专业英语自身的特点。例如，拉丁与希腊语对医学英语无处不在的影响就是医学英语的显著特点之一。对医学构词或对常见于医学文章的词组不甚了了，要顺当地进行专业阅读也是很难想象的。

由于本书的主旨是提高医学院校学生的专业英语阅读能力，本书在编写时充分考虑了这些方面的需要。在选材方面，全部材料都来自原版医学书籍，涉及面尽可能广泛，以人体系统的解剖、生理和病理为主线，兼顾微生物、寄生虫、免疫、遗传等众多与医学相关的领域。所选文章语言流畅，可读性强；既是地道的医学内容，又明白易懂，甚至可为非医科专业的人员阅读。全书分两部分共 84 课，前 42 课课后附有句子分析，后 42 课课后附有语法复习，另外每篇课文后都列有相当数量的词组积累和医学构词，为初涉专业阅读者当向导。

本书强调原文阅读，辅以少量阐释，这种形式决定了使用上的灵活性。在使用方法方面，本书可作正规的教学用书，学生在教师的指导下循序渐进；也可作为自学读本，学生随意浏览、各取所需。在使用时间方面，本书可在学生学完普通英语课程后作为向专业阅读过渡的材料；也可与普通英语同时并举，或在学生学医学基础课时，随时选用相关的内容。在使用对象中，本书主要供在校医学生使用，但也适用于过去缺乏专业阅读训练而迫切希望补上这一课的在职医务人员。由于选材全面、难度适中，本书也可作为医务人员晋升考核的比较客观的依据和较为理想的复习材料。

为大学生和其他读者提供有质量的读物，是一件非常有意义的工作。但是，我们也深切地感到，由于我们的英语水平有限，对医学知识的了解有限，所以不管在对医学英语的理解方面，还是在译文处理方面，都会有疏漏和不当之处。我们恳请读者提出宝贵意见。

参加本书编写工作的有上海第二医科大学的周文芝、郁正芬、张国平和杨谊青。王佩侠教授对全书作了审阅。

华仲乐

1994 **年** 5 **月**

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• **Part 1** •

1. Cell

CELL is the basic unit of all life. All living things——tigers, trees, mosquitoes and men – are made up of cells. Some animals and some plants consist of only one cell. Other plants and animals are made up of many cells. The body of a man has more than a million million (1,000,000,000,000) cells.

Most cells are so small that they can be seen only under a microscope. It would take about 40,000 of your blood cells to fill this letter O. It takes more than a million cells to make up one square inch of your skin.

Some one – celled plants and animals lead independent lives. Others live in loosely organized groups. In plants and animals made up of many cells ,the cells are specialists with particular jobs to do. As you read these words, for example, nerve cells in your eyes are carrying messages of what you are reading to your brain. Muscle cells attached to your eyeballs are moving your eyes across the page. Nerve cells, muscle cells, and other specialized cells group together to form tissues, such as nerve tissue or muscle tissue. Different kinds of tissues form organs,such as the eyes, heart, and lungs. All the specialized cells together form you—or a giraffe, a daisy, or a bluebird.

Almost all cells have some things in common, whether they are specialized cells or one – celled plants and animals. A cell is alive—as alive as you are. It"breathes,"takes in food, and gets rid of wastes. It grows and reproduces (creates its own kind). And, in time, it dies.

Cells differ greatly in size, in shape, and in the special jobs they do. But we can imagine a typical living cell that has the features found in almost all cells. This cell can be thought of as a tiny chemical factory. It has a control center that tells it what to do and when. It has power plants for generating energy. And it has machinery for making its products or performing its services.

A thin covering called the cell membrane or plasma membrane encloses the cell and separates it from its surroundings. The cell has two main parts: (1) the nucleus and (2) the cytoplasm.

The nucleus is the control center that directs the cell's activities. It is a round body near the center of the cell. A nuclear membrane surrounds the nucleus and separates it from the cytoplasm. The nucleus contains two important structures: chromatin and nucleoli.

Chromatin. Strands and particles of a material called chromatin are scattered throughout the nucleus. Chromatin consists chiefly of two substances — DNA (deoxyribonucleic acid) and proteins. DNA controls every living thing's heredity — the passing on of characteristics from parents to offspring. DNA makes a dog give birth to a dog instead of a mouse. It makes an oak tree different from an elephant. It determines the color of your eyes, the shape of your hands, and thousands of other characteristics.

DNA works its wonders by directing the production of complicated chemical substances called proteins. The cell's structures are built mostly of proteins. In addition, certain proteins called enzymes speed up chemical reactions in the cell. Without enzymes, these reactions would occur very slowly — or not at all. Thus, the kinds of proteins a cell makes determine the nature of the cell.

Nucleoli are round bodies that contain proteins and RNA (ribonucleic acid). RNA is chemically similar to DNA, and plays an important part in making proteins.

The cytoplasm is all the cell except the nucleus. Proteins are made in the cytoplasm, and here most of the cell's life activities take place. The cytoplasm is mostly water. Many tiny structures called organelles are submerged in this water. Each has a particular job to do. These organelles are called mitochondria, lysosomes, the endoplasmic reticulum, centrioles, and Golgi bodies.

Mitochondria are the power producers of the cell. A cell may contain hundreds of mitochondria. These sausage-shaped structures produce almost all the energy the cell needs to live and to do its work.

Lysosomes contain enzymes that can break down most of the cell's structures. One job of lysosomes may be to dissolve cells after they die. Lysosomes are round bodies.

Endoplasmic reticulum is a system of deep channels that winds throughout the cytoplasm. The sides of some channels are smooth. Others are bordered by tiny round bodies that contain large amounts of RNA. Some channels appear to extend to openings in the cell and nuclear membranes. The tiny round bodies that line some channels are called ribosomes. They are the cell's manufacturing units. The proteins the cell needs to grow, repair itself, and perform hundreds of chemical operations are made on the ribosomes.

Centrioles look like two bundles of rods. They lie near the nucleus, and are important in cell reproduction.

Golgi Bodies, also called Golgi complex or Golgi apparatus, consist of a stack of flat, baglike structures. Scientists are unsure what these structures do.

Membranes enclose the entire cell, the nucleus, and all the organelles. The membranes hold the cell and each of its parts together. Most membranes consist of two layers of a fatty substance calle phospholipid, sandwiched between two layers of protein. Only needed materials can enter the cell and its parts because of the structure and chemical composition of the membranes.

Sentence Analysis

1. It has a control center that tells it what to do and when.

   本句中包含着关系代词 that 引导的定语从句，修饰 center。疑问词 what＋动词不定式 to do，相当于一个名词，作 tell 的直接宾语。when 后面省略了 to do it，与 what to do 并列，也是 tell 的直接宾语。

2. The proteins the cell needs to grow, repair itself, and perform hundreds of chemical operations are made on the ribosomes.

   the cell needs...chemical operations 是一个定语从句，省略了在从句中做 need 宾语的关系代词 which 或 that。grow，repair 和 perform 是三个并列的动词不定式，在从句中做目的状语。

Phrase Accumulation

give birth to	产生，引起，生(孩子)
work wonders	创造奇迹
be built of	由…(材料)建造
speed up	加快速度
(not) at all	(用于否定句)丝毫，根本

Word Formation

医学英语词汇中有许多来自其他语言的词汇，尤其是来自希腊语和拉丁语。古希腊是古代医学的发源地，在古希腊语中就有许多医学的术语和名称。拉丁语中也有很多医学术语和名称，不少就是从希腊语吸收过来的。"医学与拉丁"、"医生与拉丁"曾经有过难分难解的结合，这种关系在现代医学文献中仍一目了然。

很多医学词直接来自希腊语和拉丁语。reticulum 一词，意为"网"，是直接从拉丁语引入的，membrane 也一样。甚至 organ 和 tissue 也是直接或间接地取自希腊语或拉丁语。但是，希腊语和拉丁语对医学英语的更大贡献，则在于它们为医学构词提供了大量的词素，这些词素相互结合，产生了数以万计的医学词汇。

本读物将以最简明的方式对医学英语构词作些介绍，并结合各篇文章的内容，逐步地使读者了解最常用的一些构词成分。

在关于细胞的这篇文章中，cytoplasm 一词是由 cyto-"细胞"和-plasm"浆液"两个词素构成的，因而，表示"细胞质"。protoplasm 中的 proto-也是一个词素，意为"第一""首要"或"原始"，因而 protoplasm 表示"原生质"。ribosome(核糖体)和 lysosome(溶酶体)中的-some 来自希腊词 soma，表示"体"；ribo-表示"核糖"，而 lyso-表示"分解"，因此，ribosome 和 lysosome 的意义在很大程度上就是由它们的构词成分所决定的。

2. Atoms and Radioactivity

Atoms are inconceivably small particles that form the building blocks of matter, the smallest complete units of which all matter is made. To visualize the size of an atom, one can think of placing millions of them on the sharpened end of a pencil and still having room for more. Everything about us, everything we can see or touch, is made of atoms – the food we eat, the atmosphere, the water in the oceans, the smoke coming out of the chimney.

Despite the fact that the atom is such a tiny particle, it has been carefully studied and has been found to have a definite structure. An atom is made up of a nucleus (not to be confused with the cell nucleus) which contains positively charged electric particles called protons and noncharged particles called neutrons.

The neutrons, protons and electrons usually are equal in number in any atom; collectively, they are responsible for all of the atom's characteristics; individually, they play a role in the atom's function. The neutrons and protons are tightly bound in the nucleus, contributing nearly all of the atom's weight and mass. The positively charged protons keep the negatively charged electrons in orbit. The electrons contribute the characteristics of the specific atom.

Most atoms have several orbits, or shells, of electrons. Each shell has a definite capacity to hold electrons: the shell nearest the nucleus can hold no more than two electrons; the second shell can hold eight, as can the third or fourth shell. Each shell is progressively farther from the nucleus and bound less strongly to it.

If the outer orbit has more than four electrons (but less than eight) the atom normally tends to complete this orbit by gaining electrons Such atoms are called non – metals. If the outer orbit has less than four electrons that atom normally tends to lose those electrons to attain a complete outer orbit. Such atoms are called metals.

No discussion of atoms is complete without reference to the part some play in the diagnosis and treatment of disease. Atoms of an element may exist in several forms called isotopes. These forms are alike in their chemical reactions but differ in weight. For example heavy oxygen is much like regular oxygen except for its weight. This greater weight is due to the presence of one or more extra neutrons in the nucleus of the heavier isotope. Isotopes may be stable and maintain a constant character; others fall apart (disintegrate) as they give off small particles called rays, and these are said to be radioactive. Radioactive elements may occur naturally, as is the case with such very heavy isotopes as radium and uranium. Others may be produced artificially from nonradioactive elements such as iodine and gold by bombarding (smashing) the atoms in special machines.

The rays given off by radioactive elements have the ability to penetrate and destroy tissues and so are used in the treatment of cancer and other illnesses. Radioactive materials may be placed in a special apparatus called a bomb, as with radioactive cobalt in the cobalt bomb, used in the treatment of deep-seated cancer. In the form of needles, seeds or tubes, implants containing radioisotopes are widely used in the treatment of many types of cancer.

In addition to its therapeutic values, radiation is extensively used in diagnosis. X-rays penetrate the tissues and produce an impression of their interior on a photographic plate. Radioactive iodine and other "tracers" show the workings of many body organs. Rigid precautions must be followed by hospital personnel to protect themselves and the patient when using radiation in diagnosis or therapy because the rays can destroy healthy as well as diseased tissues. Radioactivity plays an important part in industry. Certain synthetic plastic material, such as the polyethylene ware used in hospitals, retains its shape and usefulness at considerably higher temperatures after having been exposed to radioactivity. An example is the tubing used in some laboratories. There is also extensive research being carried on involving the "irradiation" of various types of foods to retain their quality longer. It may be that in the near future we will be able to buy ten pounds of potatoes instead of five without having to worry about their sprouting before being used.

Sentence Analysis

1. Atoms are inconceivably small particles that form the building blocks of matter, the smallest complete units of which all matter is made.

   本句包含一个由 that 引导的定语从句，修饰 particles；the smallest complete units 是 small particles 的同位语，of which all matter is made 则是另一个定语从句，修饰 units.

2. There is also extensive research being carried on involving the "irradiation" of various types of foods to retain their quality longer.

   being carried on 是被动形式的现在分词作定语，修饰 research 表示"正在被进行的"；involving 也是现在分词，同样修饰 research，表示"涉及…的"。不定式短语 to retain …作状语，表示目的。

Phrase Accumulation

be responsible for	对…负有责任；是…的原因
play a role (part) in...	在…起作用
fall apart	崩溃，破裂
except for	除…以外；除去
in the near future	在不久的将来

Word Formation

正如原子是构成化学元素的最小单位，词素是构词的最小单位。所谓词素，即具有独立含意而不可再分割的语言基本要素。cyto-，-plasm 就是这样的词素。词素当然还可以分成更小的字母组合，但却不再具有它原先表示的特定含意。

构成原子的三种粒子的名称 electron，proton 和 neutron，包含着三个不同的词素：electro-"电"，proto-"原始的"和 neutro-"中性的"，将它们再行分割，或者成了具有别的意义的词素（如 pro-也是一个词素），或者变成了毫无意义的字母组合，总之是失去了原有的独立含意。

radio-"放射"，photo-"光"和-graph"图像"，是出现于本篇文章词汇中的另一些词素。将 photo-和-graph 结合，就得到 photograph（照片）。这两个词素也出现在普通英语词中，如 photo-copy（照相复制），telegraph（电报）和 geography（地理），但更大量地出现在医学词汇中：例如，photometer（光度计），phototropic（向光的），cardiograph（心动描计器），encephalography（脑照相术）。

isotope（同位素）也是由两个词素构成：iso-"相同"，top-"位置"。包含 iso-的词例有 isoelectric（等电位的），isochromatic（等色的）；包含 top-的词例有 topograph（局部解剖学，意即人体"位置"的"图像"），topoanesthesia（位置感缺失，anesthesia 意为"感觉缺失"）。

3. Fundamental Units of Matter

When two or more atoms unite, a molecule is formed. It can be made of like atoms, as in the case of the oxygen molecule which is made of two identical atoms; such substances are called elements. An element cannot be decomposed – that is, changed into something else – by physical means (e. g., by the use of heat, pressure, electricity), nor can it be broken up by chemical methods. Examples of elements include various gases, such as hydrogen, oxygen and nitrogen; liquids, such as the mercury used in thermometers and blood pressure instruments; and many solids, such as iron, aluminum, gold, silver and carbon. Graphite (the so-called lead in a pencil), coal, charcoal and the diamond are examples of the element carbon. The entire universe is made up of about 100 elements. However, most are combined with others to form compounds.

Usually, we think of molecules as including two or more different atoms. For example, a molecule of sodium chloride, which is common table salt, includes one atom of sodium and one of chlorine. Those substances that contain molecules formed by the union of two or more different atoms are called compounds. Compounds may be made of a few elements in a simple combination or they may be very complex—some, such as protein, have thousands of atoms. The simplest compound would have molecules each of which contains one atom of each of the two elements which unite to form the compound. An example of such a compound is the gas carbon monoxide, which contains one atom of carbon and one atom of oxygen. Some compounds are called organic (because they were first found only in living organisms) and are very complex. The starch found in potatoes, the fatty layer of tissue under the skin and the majority of drugs are organic compounds.

It is interesting to observe how different a compound is from any of its constituents. For example, two atoms of hydrogen, which we know as a gas, unite with one atom of oxygen, also a gas, to form a molecule of a liquid, water. Water is remarkably different in its appearance and its properties from its component gases. Another example is a form of sugar, glucose, a thick syrupy liquid. Its constituents include 12 atoms of the gas hydrogen; six atoms of the gas oxygen; and six atoms of the solid element carbon. In this case, the component gases and the solid carbon do not in any way resemble the glucose.

It is fortunate that not all elements or compounds combine chemically when brought together. If such were the case, we would be unable to keep intact the hundred or so different compounds in blood plasma while it is dried or frozen. Dried (powdered) plasma may be sent long distances easily and inexpensively. It may then be reconstituted by adding sterile water as it is needed in a war zone or at the scene of a major disaster. The many valuable compounds in the plasma remain separate entities with their own properties. Such combinations are called mixtures — blends of two or more substances. Salt water is a mixture, both the salt and the water remaining separate compounds. The substances in a mixture can be present in any proportion, while in a compound the elements combine in definite proportions. You can stir any amount of salt into a given amount of water and still have a mixture. However, if one more atom of oxygen were added to a water molecule, you would have an entirely new compound called hydrogen peroxide, not water. Air is a mixture of gases, and any room with people in it will contain less oxygen than an empty room. Seawater is a mixture of water and dissolved solids; the amount of each will vary in different places, the water being less salty near the mouths of rivers. The compounds in a mixture can usually be separated by mechanical means, such as dissolving or boiling. If salt water is boiled, the compound water will eventually escape as steam or vapor, which, if collected in a bottle and cooled, regains its water state. The compound salt will remain in the pan appearing as the original white granules.

To better understand the relationship of mixtures, compounds, elements, molecules and atoms, we can follow the changes that occur in the transfer of a mixture to the individual atom. As was previously mentioned, salt and water in a salt water mixture regain their original properties by simple boiling. If we were able to take one grain of salt and cut it into halves, cut one section in half again, and continue doing so, we would still have the same properties as salt. The smallest particle obtainable that would still have the properties of salt is the salt molecule, which is made up of one atom of the element sodium, and one atom of the element chlorine. Thus we have regressed from the mixture to the atom. To summarize, we can say that salt water, a mixture, is made up of two compounds, salt and water. The components of salt are atoms of the element sodium and atoms of the element chlorine. The water, of course, can be broken down in like manner to its atoms of hydrogen and oxygen.

When discussing the structure of the atom, we mentioned the positively charged protons that are located in the nucleus, with the corresponding number of negatively charged electrons orbiting in the surrounding space and neutralizing the protons. If we can imagine removing a single electron from the sodium atom, it would leave one proton not neutralized, and the atom would have a positive charge. This can actually happen — the freely whirling electron can leap out of its orbit. Likewise atoms can gain electrons so that there are more electrons than protons. Such an atom is negatively charged. An atom with a positive or negative charge is called an ion. An ion that is positively charged is a cation, while a negatively charged ion is an anion.

When an atom loses an electron, it searches for another electron and will attach itself to an anion that has an extra one. The anion, in turn, is eager to give up its extra one to the cation. Let us imagine a positively charged sodium ion coming in contact with a negatively charged chlorine atom. The chlorine atom readily gives up its extra electron to the needy sodium ion, and the two particles, because of their opposite charges which attract each other, will cling together and produce the compound sodium chloride. As was previously mentioned, this is ordinary table salt. A vast number of chemical compounds are made by this method of electron transfer.

In the tissue fluids and in the cells of the body, ions make it possible for materials to be altered, broken down, and recombined to form new substances. Calcium ions are necessary for the clotting of blood, the normal relaxation of muscle, and the health of bone tissue. Carbonate ions are required for the regulation of acidity and alkalinity of the tissues. The stable condition of the normal organism, called homeostasis, is influenced by ions.

Sentence Analysis

1. The simplest compound would have molecules each of which contains one atom of each of the two elements which unite to form the compound.

   本句的两个 which 都是关系代词，都引导定语从句。第一个从句从 each of which 开始至句末，修饰 molecules；第二个从句 which unite to form the compound 修饰 elements.

2. If such were the case, we would be unable to keep intact the hundred or so different compounds in blood plasma while it is dried or frozen.

   本句使用的是虚拟语气，表示与现实情况相反的假设；因此在条件句中用 were 代替 is，在主句中用 would 代替 will。形容词 intact 作宾语补语，正常词序应是 keep the hundred or so different compounds in blood plasma intact，因宾语较长，而将 intact 提前。时间状语从句 while it is dried or frozen 修饰 keep…。

Phrase Accumulation

break up	分裂，分解
be different in...from...	在…方面与…不同
be able to (do sth)	能够(做某事)
give up	放弃，抛弃
in contact with...	与…接触

Word Formation

作为构词基本单位的词素，根据它们在构词中的不同作用，可以粗略地分成三个部分：词根(也称词干)、前缀和后缀。

词根是派生词中不可缺少的部分(派生词是由词根的结合或在词根上添加前缀或后缀而构成的词汇)。每个词根都有明确而具体的含义，或者指物(cyto-，photo-)，或者指概念(neutro-，iso-)，也可指动作(lyso-)和其他许多不同情况。我们已经看到，同一个词根可以