

BLOQUE II: ANATOMY AND PHYSIOLOGY

UNIT 5

“INTRODUCTION TO MEDICAL TERMINOLOGY”

Current medical vocabulary is based on terms of Greek and Latin origin, **eponyms** (words formed from a person’s name), and modern language terms. The majority of medical terms are derived from word parts based on Greek and Latin words.

When we see medical terms, we should look at them differently from other words in the English language.

Your task in learning medical terminology is to break these big words into smaller components, understand the meaning of those components, and then create an overall definition for the medical term.

ANATOMY OF A MEDICAL TERM

There are five components to medical terms. Typically, a medical term will use two or three of these components. There is no rule that states how many parts a medical term must use. Your goal is to break down a medical term into its component parts, then define each part separately.

These word parts are as follows:

The Root

The root is the foundation of the term. It is the basic essential part of the word that other words are derived from. The following are examples of roots:

Root	Meaning	Example of Use
Cardi	= <i>Heart</i>	Cardiology = <i>Study of the heart</i>
Hemat	= <i>Blood</i>	Hematology = <i>Study of blood</i>
Dermat	= <i>Skin</i>	Dermatology = <i>Study of skin</i>
Gastr	= <i>Stomach</i>	Gastrology = <i>Study of the stomach</i>
Enter	= <i>Small intestine</i>	Enterology = <i>Study of the small intestine</i>

The Combining Vowel

It is a vowel that is used to link the root to its suffix. In most cases it is the letter “o”. The combining vowel has no meaning and therefore will not alter the meaning of the term. The following is an example of how the combining vowel is used:

Table 1. Combining forms

Combining forms	Definition	Combining forms	Definition
Arthr/o	Joint	Hemat/o	Blood
Bi/o	Life	Hepat/o	Liver
Carcin/o	Cancer	Hist/o	Tissue
Cardi/o	Heart	Iatr/o	Treatment
Cephal/o	Head	Leuk/o	White
Cis/o	To cut	Nephr/o	Kidney
Col/o; Colon/o	Large intestine (colon)	Neur/o	Nerve
Cyst/o	Urinary bladder; cyst	Ophthalm/o	Eye
Cyt/o	Cell	Opt/o	Eye; vision
Derm/o	Skin	Oste/o	Bone
Dermat/o	Skin	Path/o	Disease
Electr/o	Electricity	Radi/o	X-Rays
Encephal/o	Brain	Ren/o	Kidney
Enter/o	Small intestine	Rhin/o	Nose
Erythr/o	Red	Sarc/o	Connective tissue
Gastr/o	Stomach	Sect/o	To cut
Glyc/o	Sugar	Thromb/o	Clot/clotting
Gnos/o	Knowledge	Ur/o	Urine; urinary tract
Hem/o	Blood		

Table 2. Prefixes

Prefix	Definition	Prefix	Definition
A-, An-	No; not; without	Hypo-	Deficient; below; under; less than normal
Brachy-	short	In-	In; into; not
Dia-	Through; complete	Intra-	Within; into
Dolichol-	long	Meso-	middle
Endo-	In; within	Pro-	Before; forward
Epi-	Above; upon; on	Re-	Back; again; backward
Ex-, exo-	Out; away from	Retro-	Behind; back; backward
Extra-	outside	Sub-	Under; below
Hyper-	Above; excessive	Trans-	Across; through

Table 3. Suffixes

Suffix	Definition	Suffix	Definition
-ac, -al, -ic, -ical	Pertaining to	-ion	process
-algia	pain	-ist	specialist
-centesis	Surgical puncture to remove fluid or gas	-itis	inflammation
-cyte	cell	-logy	Study of
-cytosis	Increase in cell number	-oma	Tumor; mass; fluid collection
-drome	To run	-opsy	View of
-ectomy	Removal; excision; resection	-osis	Abnormal condition
-emia	Blood condition	-pathy	Disease condition; emotion
-emic	Pertaining to a blood condition	-scope	Instrument for visual examination
-genic	Produced by or in	-scopy	Visual examination
-gram	record	-sis	State of; condition
-graph	Instrument for recording	-tomy	Incision; process of cutting
-graphy	Process of recording		

UNIT 6

THE MUSCULAR SYSTEM

Muscles, bones and tissues are the elements which constitute the human body. Muscles probably form half of its weight and they can be divided into voluntary, involuntary and cardiac. All muscle has the ability to contract, and this enables it to move parts of the body.

Voluntary muscles are found in the head, trunk and limbs, and also include those muscles attached to the eye, tongue and pharynx. They are called voluntary because they are controlled at will. They cause the movements of the body, control posture, rhythmic movements of respiration and produce body heat. The names of the muscles may be derived from their location, function, shape, size and direction. Examples of this are the gluteus maximus, gluteus minimus, flexor, intercostal, tibialis anterior, serratus, transverse abdominis, rhomboid, rectus abdominis, abductor, etc.

Involuntary muscles contract involuntarily or automatically. They are found in the heart (cardiac muscle), eye's iris, the walls of blood vessels, intestines, urinary bladder, the uterus etc. Among other functions, involuntary muscle, regulates the size of blood vessels in order to maintain blood pressure, moves food through the intestines, and urine from the kidneys to the bladder.

Some of the diseases of the muscular system are:

-Muscular dystrophy, genetic disease which damages muscle fibers. Its symptoms include weakness, loss of mobility and lack of coordination. It has no cure.

-Myasthenia gravis, autoimmune disease. It causes muscle weakness and fatigue. The brain loses control over some muscles and results in difficulty breathing and swallowing.

-Cerebral palsy affects posture, balance and motor functions. Brain damage, during or before childbirth, causes loss of muscle tone.

-Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease which affects nerves in the brain. It is a fatal disease and leads to a loss of control over voluntary muscle. The patient is unable to speak, swallow and breathe due to paralysis.

Fibromyalgia is a chronic disorder characterized by generalised muscle pain, stiffness, fatigue and tenderness in localised areas. It is rather difficult to diagnose it but has gained acceptance as a recognized health issue in the last decade.

CONTENT

Understanding Information:

A) Answer the following questions:

1. What percentage of the body's weight is formed by muscles?
2. What do voluntary muscles allow us to do?
3. Why are involuntary muscles called like this?
4. Where are involuntary muscles found?
5. Why does cardiac muscle have its own classification within the involuntary muscles group?
6. Gives examples of muscles identified by:
 - Function
 - Shape
 - Size
 - Direction
 - Location
7. Why is the ALS deadly?
8. Why do you think fibromyalgia is referred to as an 'invisible' illness by some people?

UNIT 7

THE SKELETAL SYSTEM

The adult skeletal system consists of 206 bones, as well as a network of tendons, ligaments and cartilage, which are connected to one another and form the frame and shape of the human body.

The skeletal system performs vital functions such as support, movement, protection, blood cell production etc. Bones are alive inside the body and are fed by blood vessels and nerves.

In the skeleton we differentiate the vertebral column, the rib cage and the skull. These parts transmit the weight from the head, trunk and upper limbs down to the lower extremities at the hip joints, which help humans maintain our upright posture. They protect the brain and heart, among other organs.

The skeleton is also formed by upper extremities, pelvis and lower extremities. These parts make walking, running and other movement possible and to protect the major organs responsible for digestion, excretion and reproduction.

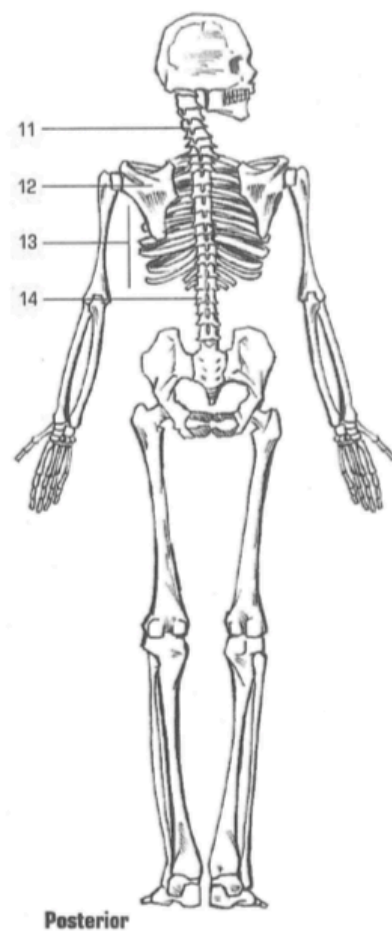
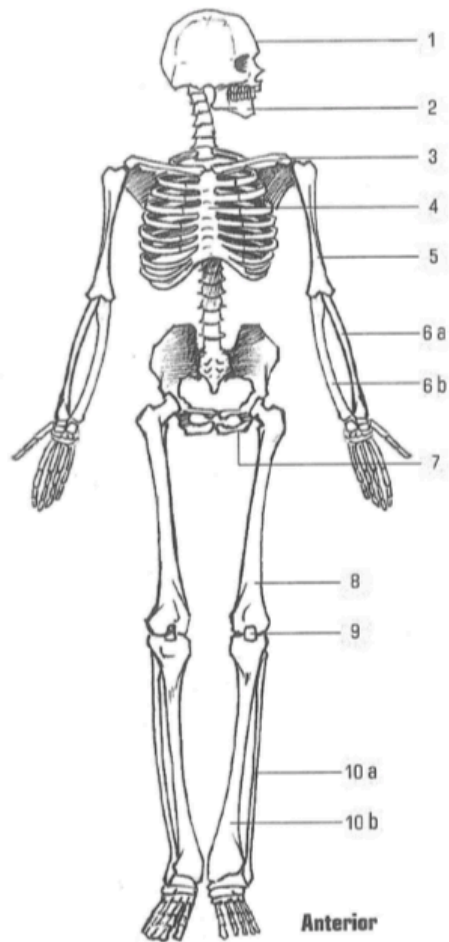
Osteoporosis is a disease of the skeletal system. It particularly affects the elderly and women, and it results in the loss of bone tissue. Bone loses calcium and it becomes thinner.

The scoliosis is a curvature of the spine, often creating a pronounced “c” or “s” shape when viewed on an x-ray. It is typical in adolescents.

The arthritis is an inflammatory disease which attacks the joints and their surrounding tissue. It usually affects the joints of the neck, shoulders, hands, lower back, hips or knees.

Bone cancer originates in the bone and may spread to other parts of the body. While leukemia primarily affects the blood, the skeletal system is involved as the cancer starts in the marrow of the bone.

Bursitis is a disorder that causes pain in the body joints. It is caused by an inflammation of the bursa (small fluid-filled bags that act as lubricating surfaces for muscles to move over bones)



CONTENT

Understanding Information:

A) Answer the following questions:

1. Why are bones important?
2. Why does the text say that bones are “alive”?
3. What can we do to prevent osteoporosis?
4. How is leukemia related to bones?

B) Read these sentences and decide which are true (T) or false (F). Justify your answer when false.

1. A patella is larger than a fibula. ____
2. The muscles help the bones to move. ____
3. The body is built up by different limbs. ____
4. The femur is a long bone. ____
5. Bones are the softest parts of the body. ____
6. A surgeon is a strong bone. ____
7. The forearm has two bones, the ulna on the outside and the radius on the inside ____
8. The ribs are a series of curved bones ____
9. The skeleton doesn't support muscles and tissues of the body ____

UNIT 8

“GROSS ANATOMY OF THE TRUNK”

1. The trunk is the central part of the body. The neck and head extend above the trunk and are continuous with it. The upper limbs are attached to either side of the trunk and the lower limbs extend downwards from it. The outer tissues of the trunk form the body wall.
2. The trunk consists of two main cavities, namely the thorax and the abdomen. These are separated by a dome-shaped muscle known as the diaphragm. The thorax lies above the diaphragm, and the abdomen lies below it.
3. The posterior wall of both cavities is composed of the vertebral column and its related muscles.
4. The thoracic cavity is bounded at the sides and front by the ribs, the sternum, and the intercostal muscles. The principal internal organs contained in the thorax are the heart and the lungs.
5. The abdomen is the largest cavity in the body. It consists of two parts: the abdominal cavity proper and the pelvic cavity.
6. The lateral and anterior walls of the abdominal cavity proper are formed mainly by three layers of muscle which run concentrically round the cavity. The organs of digestion are the principal organs contained in the abdomen.
7. The pelvic cavity, or pelvis, lies below the abdominal cavity and is continuous with it. It is bounded anteriorly and laterally by bone. The contents of the pelvis are the urinary bladder, the lower part of the large intestine, the rectum, and some of the reproductive organs.

Understanding Information

True and False statements. Justify your answers when false:

1. The trunk is the same as the body ____
2. The neck and head form part of the trunk ____
3. The abdomen is bounded superiorly by the diaphragm ____
4. The abdomen is bounded superiorly by the vertebral column and its related muscles ____
5. The walls of the thoracic cavity are composed of the ribs, the sternum and the intercostal muscles ____
6. The heart and the lungs lie within the thoracic cavity ____
7. The cavity above the diaphragm is larger than the cavity below the diaphragm ____
8. The pelvic cavity can be said to be part of the abdomen ____
9. The organs of digestions are the only internal organs contained in the abdomen ____
10. The abdominal cavity and the pelvic cavity are separated by layers of muscle ____

FURTHER INPUT:**“IN PHYSIOLOGY CLASS”**

In the class of anatomy and physiology the professor starts his lecture this way:

“The heart is the most important organ of the human body because it maintains life. The heart is important to the life of men and animals because it regulates the circulation of blood throughout the body. By means of the blood that circulates through the body, oxygen and food are supplied to body cells. If the heart stops beating, the brain is damaged forever. Man lives while his heart is beating; if it stops, man dies. Man is capable of living without an arm, a lung, or a hand, but not without a heart.”

Answer the following questions:

1. What is the most important part of the body?
2. Why is blood circulation so important?
3. Why is oxygen necessary?
4. What happens when the heart stops beating?
5. Why can a man live without a lung but not without his heart?

UNIT 9

“THE COMPARTMENTS OF THE BODY”

1. The body has three compartments. The first of **these^a** consists of active tissue, which is also known as cell mass. **This^b** does most of the chemical work of the body.
2. The second compartment consists of supporting tissue. **This^c** is composed of bone mineral, extracellular proteins, and the internal environment, or the extracellular fluid in the blood and lymph.
3. The third compartment is the energy reserve. **This^d** consists of fat, which lies round the principal internal organs and in adipose tissue.
4. These compartments cannot be separated by physical dissection, but it is possible to measure them indirectly. **This^e** may be done using methods such as the dilution technique.
5. The size of each compartment varies according to the age, sex and health of the individual. In a healthy young man, the total body weight is divided approximately: 55% cell mass, 30% supporting tissue, and 15% energy reserve. A healthy young woman has normally twice as much fat.

CONTENT

Understanding Information. TRUE or FALSE statements. Justify your answers.

1. The first compartment of the body consists of cell mass ____
2. The second compartment of the body is composed of bone minerals ____
3. The internal environment is composed of the extracellular fluid in the blood and lymph ____
4. The energy reserve is composed of adipose tissue and fat which lies round the principal internal organs ____

5. The compartments of the body are measurable ____
6. The dilution technique is the only method of measuring the compartments of the body ____
7. The sum of the sizes of the compartments equals the total body weight ____
8. The energy reserve of a healthy young woman is approximately 30% of her total body weight ____

Discourse Analysis:

A) **Contextual reference:** Write the following sentences in your notebook and complete them after studying the reading passage.

1. “**these^a**” refers to _____

2. “**This^b**” refers to _____

3. “**This^c**” refers to _____

4. “**This^d**” refers to _____

5. “**This^e**” refers to _____

B) Rewrite the following sentences, replacing the underlined words with expressions from the reading passage which have the same meaning:

1. In a healthy young man, approximately 55% of the total body weight consists of **cell mass**

2. The energy reserve **consists of fat** _____

3. The supporting tissue consists partly of the **extracellular fluid in the blood and lymph**

4. The compartments **are not separable** by physical dissection

5. Supporting tissue makes up **about** 30% of the total body weight

6. A young woman has **usually** twice as much fat as a young man _____

UNIT 10

“THE CIRCULATORY SYSTEM”

Pre-questions:

Can you compare the human body to a motor or piping system? In what way?
Can you describe any disease related to the blood?

1. Blood is indispensable to live. Without blood, the cells which form the human body would die. The blood's fundamental function in our body is to carry food and oxygen to the cells, enabling them to grow and multiply. At the same time, it helps in the elimination of harmful substances.
2. The circulatory system impels and makes blood circulate through the whole body, and the heart is the motor of this system.
3. The heart is a muscular organ which has four cavities: two auricles in the upper part and two ventricles in the lower part. Its walls are thick in the ventricles and thin in the auricles. Two arteries, with thick and flexible walls, come out from the heart and supply blood to the whole body. The veins, with thinner walls than the arteries, also distribute blood to supply it to the most remote parts of the body, and later return it to the heart.
4. Blood is formed by a liquid substance called plasma, and 90 per cent of this liquid is water; different components constitute the other 10 per cent, such as red and white corpuscles. Hemoglobin is a red substance which gives the blood its red color.
5. To keep the circulatory system in good condition we should follow these elementary rules:
 - Do moderate exercise.
 - Avoid wearing tight clothes.
 - Do not stand up for long periods of time.
 - Stop smoking and drinking alcohol.
 - Give up eating fatty and salty foods.

It has been shown that if we look after our heart our life expectancy will certainly increase.

Understanding Information

A) Answer the following questions:

1. What are the two important functions of the blood in the human body?
2. What is the blood made out of?
3. What is the function of the heart in the circulatory system?
4. Give a brief description of the heart
5. What is the function of veins and arteries?

B) True (T) and False (F) statements. Justify your answers:

1. Body cells can live without oxygen ____
2. The blood carries food to the cells ____
3. The heart's only function is to "clean" the blood when it returns from the different organs of the body ____
4. This "cleaning" function is carried out through the veins ____

C) Translate the following sentences into English:

1. Los músculos voluntarios los controlamos a voluntad
2. En el accidente de tráfico, el paciente se fracturó el esternón y el peroné derecho
3. El cáncer óseo se origina en la médula ósea y puede extenderse a otras partes del cuerpo
4. El paciente se ha torcido el tobillo y necesita acudir a Urgencias
5. La escoliosis es una enfermedad que afecta a gente joven y puede causar una discapacidad
6. El anciano tuvo una caída y padece fracturas múltiples de costilla
7. Si no iniciamos maniobras de reanimación cardiopulmonar, padeceremos daño cerebral permanente
8. El tejido de soporte está compuesto de mineral óseo y la reserva energética está compuesta de tejido adiposo
9. Debemos dejar de comer alimentos salados y grasos para mejorar la circulación sanguínea

COMMUNICATION

USEFUL EXPRESSIONS FOR A DIALOGUE:

- ⇒ Have a temperature
- ⇒ Have a pain
- ⇒ Have a sample
- ⇒ Have a plaster
- ⇒ Have an allergy
- ⇒ It hurts
- ⇒ What are your symptoms?
- ⇒ I've been having headaches
- ⇒ I'm very congested
- ⇒ My joints are aching
- ⇒ I've got diarrhea
- ⇒ I've got a lump
- ⇒ I've got a swollen/sprained ankle
- ⇒ I'm in a lot of pain
- ⇒ I've got a pain in my back/chest/waist
- ⇒ Where does it hurt?
- ⇒ Does it hurt when I press here?
- ⇒ You should stop smoking
- ⇒ You should cut down on your drinking
- ⇒ You need to try and lose some weight
- ⇒ I want to send you for an X-ray
- ⇒ The Dr. wants you to see a specialist/ to send you for an x-ray
- ⇒ We need to take a urine sample/stool sample/ a blood sample.
- ⇒ You need to have a blood test
- ⇒ My joints are aching
- ⇒ I think I've pulled a muscle in my leg
- ⇒ Can I have a look?
- ⇒ My back aches
- ⇒ I've got a lump/swollen leg, etc.
- ⇒ Your arm/leg, etc. is broken, so we need to put it in a plaster.
- ⇒ You should stop smoking/cut down on your drinking/take a rest/ lose some weight, etc
- ⇒ Can you tell me what's wrong? / Can you tell me what the problem is?
- ⇒ How long have you had this?
- ⇒ How long have you felt this way?
- ⇒ How long was it hurt?
- ⇒ When did it begin?
- ⇒ For XX days/ all week/ It started XX days ago

DIALOGUE

A) Read the following example of dialogue:

Nurse: Good morning, Mr./Ms. _____. How can I help you?

Patient's parent: My daughter is complaining of pain in her ankle. She fell from her horse one hour ago. I'm afraid she may have broken it.

Nurse: Oh, no! I'm sorry to hear that. I'll ask the doctor to take a look at that immediately.

Patient: Please! My left ankle hurts a lot and my wrist hurts too.

Nurse: (after the doctor's visit) As the Dr. already told you, you'll have to take some x-rays of both injuries, in order to let him know if there are any broken bones after checking the x-rays.

Nurse: (after the dr. checked the results) I'm so sorry that you have broken your wrist. As the Dr. explained to you, we'll have to set the bone and put a cast on it. However, luckily your ankle is just sprained, so we'll put a splint on it, and I'll give you some painkillers for the pain.

Patient: Thank you

B) After reading useful expressions for a dialogue and the example above, create your own dialogue considering the following premises and some ideas to help you:

- Think about the patient situation (e.g. The patient has a skin rash, stepped on a rusty nail, his/her blood pressure is high, She/he has the flu, etc.)
- What the patient symptoms are
- How the patient feels
- How long the patient has had those symptoms
- Talk about treatment/medication
- Talk about eating habits/ lifestyle
- Talk about other health problems

SOME IDEAS....

Choose the patient symptoms:

- Earache
- Headache
- Stomachache
- Toothache
- Cold
- Cough
- Sore throat
- Runny nose
- Congested
- Flu
- Fever
- Chills
- Diarrhea
- Cramps
- Vomiting
- Virus
- Infection
- Pus
- Sprain
- Break/fracture
- Inflammation
- Swelling/swollen
- Irritated
- Rash
- Bruise
- Cut
- Wound
- Injury
- Dizziness
- Cancer
- Heart attack
- Stroke

Choose the treatment

- Medicine
- Drugs
- Prescription
- Dosage
- Pill/tablet
- Lozenge
- Painkiller
- Tranquilizer
- Ointment
- Disinfectant
- Operation
- Surgery
- Set the bone
- Cast/plaster
- Splint
- Bandage
- Band-aid
- Injection
- Soak
- Check-up
- Heal
- Cure
- Physical therapy
- Massage
- Bed rest
- Doctor's note