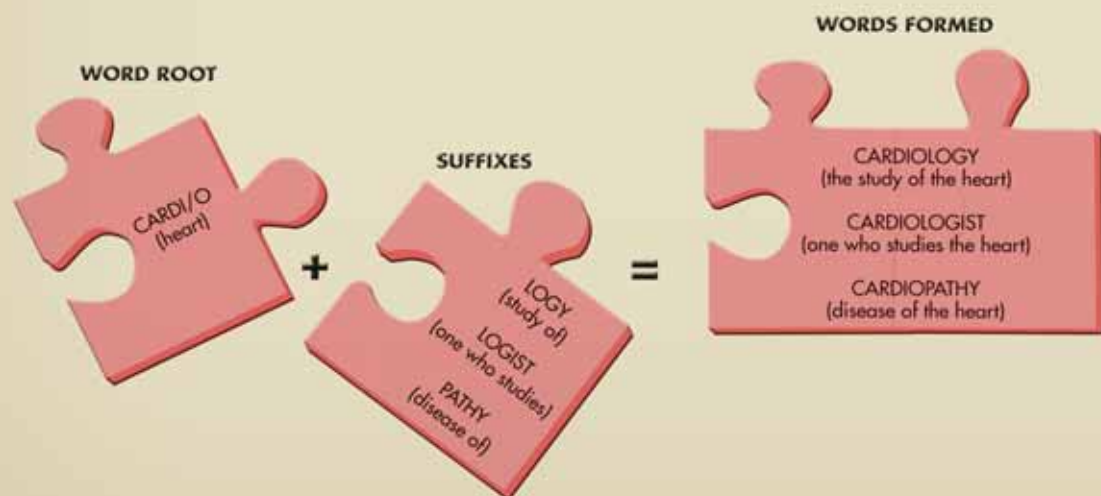


Greetings from

ANATOMY AND PHYSIOLOGY

LEARNING THE LANGUAGE

Imagine getting ready to travel to a foreign country where we do not speak the language. To maximise the success of our journey, one of the most important preparatory steps is to develop a basic understanding of the native language. The key language upon which health professions and the study of anatomy and physiology are based is medical terminology. Therefore, this chapter lays the foundation of learning the native language (medical terminology) of medicine. Future chapters build on this foundation so that, at our journey's end, we not only will understand anatomy and physiology, but will be fluent in medical terminology. This chapter also assists in understanding the road signs along our journey. The special features to enhance our journey are presented by identifiable icons, and an explanation of each feature is given in the front inside cover of your book.





LEARNING OBJECTIVES

At the end of your journey through this chapter, you will be able to:

- Understand the term *anatomy and physiology* and its various related topics
- Relate the importance and purpose of medical terminology to anatomy and physiology
- Construct and define medical terms using word roots, prefixes and suffixes
- Explain the concept and importance of homeostasis
- Contrast the metabolic processes of anabolism and catabolism

Pronunciation guide



aetiology (ee tee ALL oh jee)

anabolism (Ana BOL isum)

anatomy (An A toe me)

catabolism (Cu TAB oll isum)

diagnosis (Die ag NO sis)

homeostasis (Home ee oh STAY sis)

macroscopic anatomy (Mak row
scop ic An A toe me)

metabolism (me TA bowl isum)

microscopic anatomy (MY crow
scop ic An A toe me)

pathology (pa THOL oh jee)

physiology (Fizz ee OLL oh jee)

prognosis (Prog NO sis)

syndrome (SIN drome)

WHAT IS ANATOMY AND PHYSIOLOGY?

You're probably so accustomed to hearing the words anatomy and physiology used together that you may not have given much thought to what each one means and how they differ. They each have unique meanings. Let's take a closer look.

Anatomy

anatomy (An A toe me)

Anatomy is the study of the internal and external *structures* of plants, animals or, for our focus, the human body. The human body is an amazing and complex structure that can perform an almost limitless number of tasks. To truly understand how something works, it is important to know how it is put together. Leonardo da Vinci, in the 1400s, correctly drew the human skeleton and could be considered one of the earliest anatomists (one who studies anatomy). The word anatomy is from the Greek language and literally means 'to cut apart', which is exactly what you must do to see how something is put together. For example, the study of the arrangement of the bones that comprise the human skeleton, which is the anatomical framework for our bodies, is considered anatomy.

scope *instrument to examine*

microscopic anatomy (My crow
scop ic An A toe me)

micro = small

macroscopic anatomy (MAK row
scop ic An A toe me)

macro or gross = large

cyto = cells

histo = tissues

logy = the study of

Just as we can subdivide biology into more specific concentrations, such as cell biology, plant biology and animal biology, we can also broadly divide anatomy into **microscopic anatomy** and **macroscopic anatomy**, sometimes called **gross anatomy**. Microscopic anatomy is the study of structures that can be seen and examined only with magnification aids such as a microscope. The study of cellular structure (cytology) and tissue samples (histology) are examples of microscopic anatomy.

Gross anatomy represents the study of the structures visible to the unaided or naked eye. For example, the study of the various bones that make up the human body is gross anatomy. Viewing an X-ray of the arm to determine the type and location of a broken bone is considered an examination of gross anatomy.

physiology (FIZZ ee oll oh jee)

physio = relationship to nature

logy = study of

Physiology

Physiology focuses on the *function* and vital processes of the various structures making up the human body. These physiologic processes include muscle

contraction, our sense of smell and sight, how we breathe, and so on. We will focus on each of these processes in their respective chapters. Physiology is closely related to anatomy because it is the study of how an anatomical structure such as a cell or bone actually functions. Physiology deals with all the vital processes of life and is more complex and, therefore, has many subspecialties. Human physiology, animal physiology, cellular physiology and neurophysiology are just some of the specific branches of physiology.

Putting it all together

In summary, anatomy focuses on *structure* and how something is put together, whereas physiology is the study of how those different structures work together to make the body function as a whole. For example, anatomy would be the study of the structure of the red blood cells (RBCs), and physiology would be the study of how the RBCs carry vital oxygen throughout our body. Figure 2–1 shows deformed RBCs (sickle shaped) that are present in the disease sickle cell anaemia. Because of the anatomical deformity, the physiological process of effectively carrying oxygen is adversely affected.

You will notice on your journey that the design of a structure is often related to its function. For example, the type of joint located between bones is dictated by the functions of those bones: hinge joints are located at the knees where back and forth bending movement is required, while a ball and socket joint at the hip provides for a greater range of motion.

Learning hint



USING THE MARGINS OF THIS BOOK

Notice that the margin notes present a breakdown of the medical terms discussed in the text. Sometimes you may already know the term and may not need to refer to the margin note, but it is always there to help reinforce the word. On occasion, you may even see a short little story on the word origin where it is of interest or helps to further explain the term.

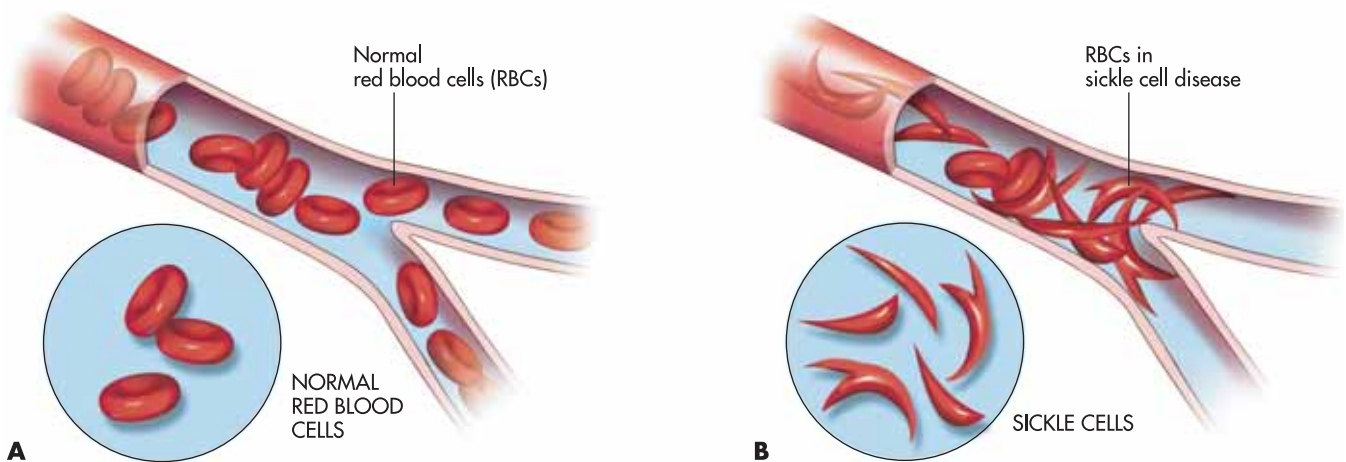


FIGURE 2-1

(a) Normal red blood cells (RBCs) are flexible and donut-shaped and move with ease through blood vessels. (b) The anatomical distortion of the *structure* of RBCs in sickle cell anaemia affects their normal *function* to carry oxygen. In addition, the sickle cells lose their ability to bend and pass through the small blood vessels, thereby causing blockages to blood flow.

Test your knowledge 2–1

Indicate whether the following examples are gross anatomy or microscopic anatomy by putting a G or M in the space provided.

- _____ viewing an X-ray to determine the type of bone fracture
- _____ classifying a tumour to be cancerous by cell type
- _____ viewing bacteria to determine what disease is present
- _____ examining the chest for any obvious deformities
- _____ a histologist and cytologist primarily study this type of anatomy

pathology (*Pa THOL oh jee*)

patho = disease; disease literally means not (*dis*) at ease

Therefore, it makes sense to combine these two sciences into anatomy and physiology (A&P). Human anatomy and physiology forms the foundation for all medical practice. Anything that upsets the normal structure or functioning can be called disease, and the study of disease is **pathology**. The study of abnormal function is **pathophysiology**.

THE LANGUAGE

Anatomy and physiology also has its own unique language that you must learn before you can converse comfortably. Some words, like *heart*, *lungs* and *blood pressure*, are already familiar to you. Others will seem strange and foreign. Let's take a closer look.

Medical terminology

As stated earlier, the language of anatomy and physiology is primarily based on medical terminology. Understanding medical terminology may seem like an overwhelming task because, on the surface, there appears to be SO many terms. In reality, there are only a relatively few root terms, prefixes, and suffixes, but they can be put together in a host of ways to form numerous terms.

Each medical term has a basic structure upon which to build, and this is

called the word root. For example, *cardi* is the word root for terms pertaining to the heart. Rarely is the word root used alone. Instead, it is combined with prefixes and suffixes that can change its meaning. Prefixes come before the word root, while suffixes come after the word root. The suffix **logy** means 'study of', and therefore, we can combine *cardi* and *ology* to form **cardiology**, which is the study of

cardi = heart

logy = study of

tachy = fast

logist = one who studies

Learning hint



COMBINING AND FORMING MEDICAL TERMS

If a suffix begins with a vowel, drop the vowel in the combining form. For example, the combining form for stomach is *gastr/o*, and if we add the suffix for inflammation, *itis*, the medical term becomes *gastritis*.

Learning hint



GENERAL HINTS ON FORMING MEDICAL TERMS

While you can learn the various word roots, prefixes and suffixes, it gets confusing trying to put them together correctly. In most instances, the medical definition indicates the last part of the term first, especially when suffixes are used. For example, an inflammation of the stomach is gastritis, not itisgastro, and one who studies the stomach is a gastrologist, not an ologistgastro. When using prefixes, you usually put the parts together in the order you say the definition. For example, slow heart rate is bradycardia, not cardiabradly. As with general rules, there are exceptions, but with practice it will become familiar to you.

the heart. The prefix *tachy* means 'fast' and can be placed in front of the word root to form **tachycardia**, which means a fast heart rate. Figure 2–2 shows the components of a medical term.

Often you will be given a combining form, which is the word root and a connecting vowel (usually *o*), to make it easier to pronounce and combine with possible suffixes. For example, the combining form for heart is *cardi/o*. Listed in Table 2–1 are some common combining forms to get you started.

Now let's add some common prefixes that can be placed before the word roots to alter their meaning (see Table 2–2).

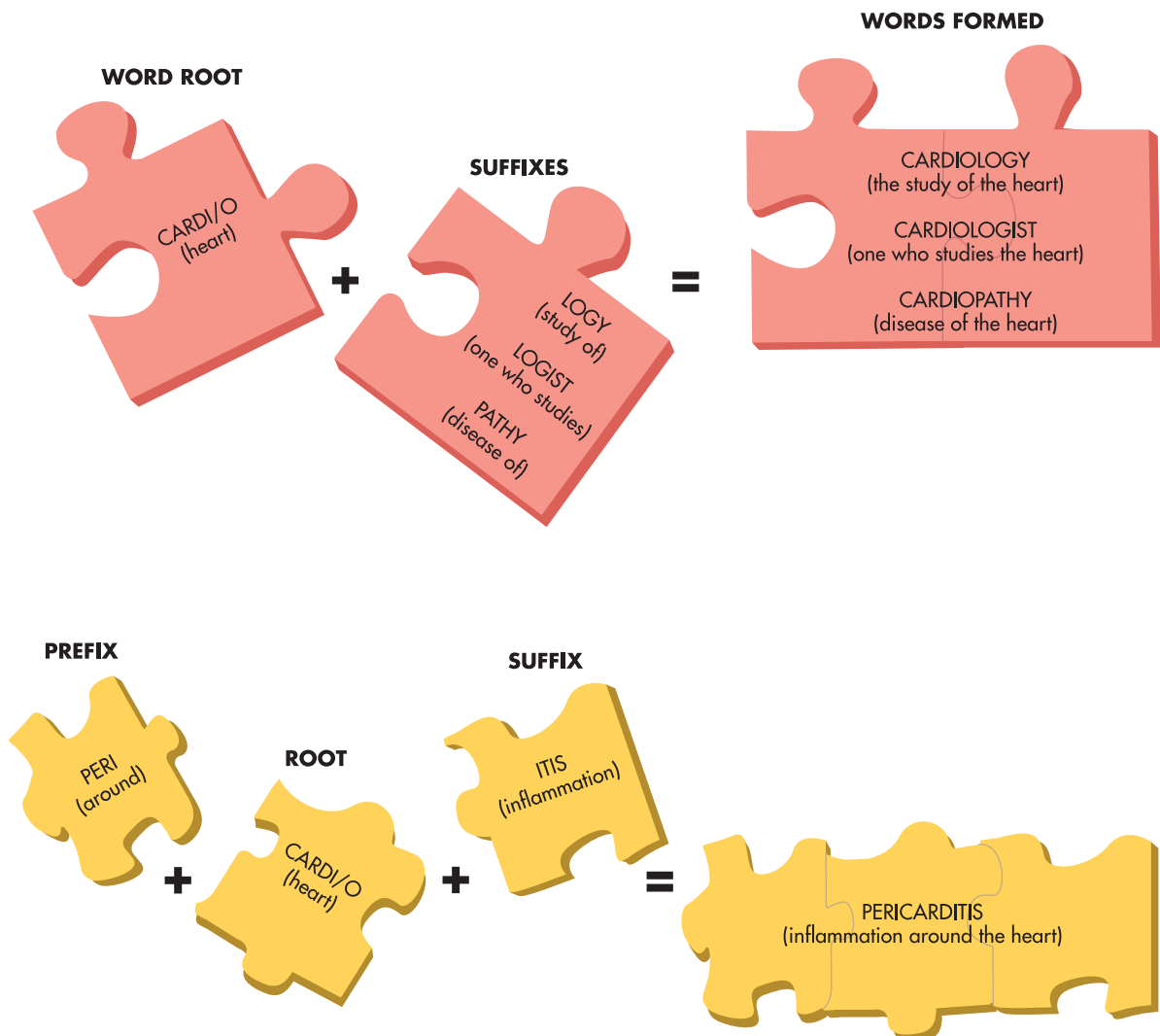


FIGURE 2–2

How prefixes and suffixes can be combined with a word root to form many medical terms.

TABLE 2–1 Common combining terms

Word root/combining form	Meaning
abdomin/o	abdomen
angi/o	vessel
arthr/o	joint
cardi/o	heart
cyan/o	blue
cyt/o	cell
derm/o	skin
erythr/o	red
gastr/o	stomach
glyc/o	sugar
hepat/o	liver
hist/o	tissue
leuc/o	white
mamm/o	breast
nephr/o	kidney
neur/o	nerve
oste/o	bone
phag/o	to swallow
path/o	disease
rhin/o	nose

Finally, let's add some common suffixes (Table 2–3) and then see what kinds of words we can form with just these few parts.

Using Tables 2–1 to 2–3, look at all the terms you can make from just the one word root, *cardi/o*. Cardiology is the study of the heart, and a cardiologist is one who studies the heart. Bradycardia is a slow heart rate, tachycardia is a fast heart rate, and an electrocardiogram is an electrical recording of the heart. If your heart were enlarged due to inflammation (carditis), you would have cardiomegaly, which would mean you have heart disease (cardiopathy). The Tin Man from *The Wizard of Oz* thought he had no heart (acardia), but realised that he had a heart all the time.

Abbreviations

Abbreviations are used extensively in the medical profession. They are useful in simplifying long, complicated terms for disease, diagnostic procedures and

TABLE 2–2 Common prefixes

Prefix	Meaning
a or an	without
acro	extremities
brady	slow
dia	through
dys	difficult
electro	electric
endo	within
epi	upon or over
hyper	above normal
hypo	below normal
macro	large
micro	small
peri	around
tachy	fast

therapies that require extensive documentation. For now, review Table 2–4 for some common abbreviations you may have heard in a health care setting or on television.

Of course you will learn many more terms and abbreviations as we explore the following chapters and become fluent in conversational medical language. This will help you to avoid using lay terms (common, everyday terms) to describe medical and anatomical concepts. Now you know that the correct term for ‘getting a nose job’ is **rhinoplasty**.

The metric system

Whereas medical terminology represents the written and spoken language for understanding anatomy and physiology, the metric system is the ‘mathematical language’ of anatomy and physiology. For example, blood pressure is in millimetres of mercury (mmHg), and organ size is usually measured in centimetres (cm). Medications and fluids are given in millilitres (ml) or cubic centimetres (cc), and weight is often measured in kilograms (kg). What exactly does it mean when you are taught that normal cardiac output is 6 litres per minute? You can now see why you must be familiar with the metric system in order to truly understand anatomy and physiology and medicine. While the metric system may seem complicated if you are not familiar with it, it really isn’t if you have a basic understanding of numeracy.

TABLE 2–3 Common suffixes

Suffix	Meaning
algia	pain
cyte	cell
ectomy	surgical removal of
gram	the actual recorded record
graphy	the process of recording
ist	one who specialises
itis	inflammation of
logist	one who studies
logy	study of
otomy	cutting into
ostomy	surgically forming an opening
megaly	enlargement of
pathy	disease
phobia	fear of
plasty	surgical repair
penia	decrease or lack of
scope	instrument to view or examine
sis	disease or condition of

Test your knowledge 2–2

Define the medical terms:

1. acrocyanosis_____
2. gastritis_____
3. rhinoplasty_____
4. bradycardia_____
5. mammogram_____
6. cytomegaly_____

Give the correct medical term:

7. inflammation of the kidneys_____
8. removal of the stomach_____
9. enlarged heart_____
10. disease of the bones_____
11. one who studies the nerves_____

TABLE 2–4 Common medical abbreviations

Abbreviations	Meaning
A&E	accident and emergency department
A&P	anatomy and physiology
BD	Latin <i>bis die</i> , which means 'twice daily'
BP	blood pressure
CPR	cardiopulmonary resuscitation
GI	gastrointestinal
ICU	intensive care unit
NPO/NBM	Latin <i>nil per os</i> , which means 'nothing by mouth'
OD	Latin <i>omni die</i> , which means 'every day'
O/E	on examination
PRN	Latin <i>pro re nata</i> , which means 'when required'
QDS	Latin <i>quarter die sumendum</i> , which means 'to be taken four times daily'
SOB	shortness of breath
SOBOE	shortness of breath on exertion
STAT	Latin <i>statim</i> , which means 'immediately'
TDS	Latin <i>ter die sumendum</i> , which means 'to be taken three times daily'

In the UK the International System of Units (SI) is commonly used in health care. The SI system is also known as the international or **metric system** and is based on the power of 10. The metric system is also the system used by drug manufacturers, and is widely used in health care around the world.

THE LANGUAGE OF DISEASE

This chapter is about planning for a smooth trip by learning the language. However, even with the most careful planning, things can still go wrong. Things such as flat tyres, airport delays and loss of money or credit cards can ruin a trip. Similarly, problems can happen to the human body. Ideally, the body works to make things function smoothly and in balance. Sometimes things happen to alter those functions. Eating habits, smoking, inherited traits, trauma, environmental factors and even ageing can alter the body's balance and lead to **disease**. Disease, simply put, is a condition in which the body fails to function normally.

While this is an anatomy and physiology course that focuses on *normal* function and structure, it is often helpful to reinforce the concepts with some

elaboration of what can go wrong. Therefore, at the end of each system chapter, a *brief* discussion on some of the major diseases associated with that system is provided. An even further in-depth discussion is contained in the companion website. For now, a brief discussion on some of the unique language of disease is needed to lay the foundation for future discussions.

Signs and symptoms of disease

Think back to a time when you were ill. You may have had a fever, cough, nausea, dizziness, joint aches or a generalised weakness. These are examples of what we call **signs** and **symptoms** of disease. While the terms signs and symptoms are often used interchangeably, each has its own specific definition. Signs are more definitive, objective, obvious indicators of an illness. Fever or monitoring the change in the size or colour of a mole are good examples of signs. **Vital signs** are common, measurable indicators that help us to assess the health of our patients. Vital signs are the signs vital to life and include pulse (heart rate), blood pressure, body temperature and respiratory rate. The standard values of vital signs can change according to the patient's age and sex.

Clinical application



THE VITAL SIGN OF PULSE

The pulse is commonly taken by applying slight finger pressure over the radial artery located in each wrist (on the thumb side) and counting the number of beats in a 60-second period (see Figure 2-3). The normal heart rate for an adult is 60–80 beats per minute, a child's rate is approximately 70–120, and a newborn's rate is 90–170 beats per minute. If an adult has a heart rate of 165 beats per minute, what medical term would you use to describe that condition?



FIGURE ■ 2-3

Taking a pulse is vital to the proper measurement of blood pressure.

Test your knowledge 2–3

Answer the following questions:

- Check which of the following are vital signs:
 - _____ pulse
 - _____ pain
 - _____ blood pressure
 - _____ age
 - _____ indigestion
 - _____ respiratory rate
 - _____ body temperature
- Which of the following is the medical term for the cause of a disease?
 - a. prognosis
 - b. diagnosis
 - c. aetiology
 - d. syndrome
- Which of the following is the medical term for the outcome of a disease?
 - a. prognosis
 - b. diagnosis
 - c. aetiology
 - d. syndrome

Symptoms, on the other hand, are more subjective and more difficult to measure consistently. A perfect example of a symptom is pain. Tolerance to pain varies among individuals, so an equal amount of pain (as in a headache) applied to a number of people could be perceived as a light, moderate or intense level of pain depending on each individual's perception. In spite of the fact that symptoms are hard to measure, they are still very important in the diagnosis of disease. Sometimes a disease exhibits a set group of signs and symptoms that may occur at about the same time. This specific grouping of signs and symptoms is known as a **syndrome**. Signs, symptoms and syndromes are further explained throughout the rest of our textbook as they relate to the anatomy and physiology of the various body systems.

Discovering as many signs and symptoms as possible can help to **diagnose** a disease. A diagnosis is an identification of a disease determined by studying the patient's signs, symptoms, history and results of diagnostic tests. Getting the medical history can help in determining the **aetiology**, or cause, of the disease. The **prognosis** is the prediction of the outcome of a disease. Hopefully, your *prognosis* for doing well in this anatomy and physiology course is excellent.

ANATOMY AND PHYSIOLOGY CONCEPTS YOU WILL ENCOUNTER ON YOUR JOURNEY

In this section, we take a closer look at some additional concepts related to the study of anatomy and physiology that you will learn more about as you journey through the chapters in this text.

Metabolism

If you travel to other countries, you will see many different cultures and customs. Even though each culture is unique, they all share certain similarities. The same can be said in anatomy and physiology. We all share certain functions that are vital to survival. All humans, for example, need food in order to produce complex chemical reactions necessary for growth, reproduction, movement, and so on. **Metabolism** refers to all of the chemical operations going on within our bodies. Metabolism requires various nutrients or fuel to function and produces waste products much like a car consumes petrol for power and produces waste, or exhaust. Metabolism, for now, can be thought of as ‘all the life-sustaining reactions within the body’.

Metabolism is further subdivided into two opposite processes. **Anabolism** is the process by which simpler compounds are *built up* and used to manufacture materials for growth, repair and reproduction, such as the assembly of amino acids to form proteins. This is the *building* phase of metabolism. **Catabolism** is the process by which complex substances are *broken down* into simpler substances. For example, the breakdown of food into simpler chemical building blocks for energy use is a catabolic process. An abnormal and extreme example of catabolism is someone with anorexia nervosa (someone who is starving themselves) whose body ‘feeds upon itself’, actually consuming the body’s own tissues.

Homeostasis

For the body to remain alive, it must constantly monitor both its internal and external environment and make the appropriate adjustments. In order for cells to thrive, they must be maintained in an environment that provides a proper temperature range, balanced oxygen levels and adequate nutrients. Heart rate and blood pressure must also be monitored and maintained within a certain range or set point for optimal functioning depending upon the body activity. **Homeostasis** is the physiologic process that monitors and maintains a stable internal environment or equilibrium. Survival depends upon the body’s ability to maintain homeostasis. Homeostatic regulation refers to the adjustments made in the human organism to maintain this stable internal environment.

The thermostat in your house functions like a homeostatic mechanism. A temperature is set and then maintained by a sensor that monitors the internal

Clinical application



METABOLIC SYNDROME OR SYNDROME X

There is an emerging and controversial (in terms of agreement) syndrome affecting individuals in the Western world called the metabolic syndrome, or syndrome X. A patient with this syndrome exhibits three of the following five common conditions: high blood sugar levels (hyperglycaemia); high blood pressure (hypertension); abdominal obesity; high triglycerides (a lipid substance in the blood); and low blood levels of HDL (which is the ‘good’ form of blood cholesterol). Individuals who exhibit this syndrome are at an increased risk from a form of diabetes, and from heart attacks and/or strokes. This is essentially a syndrome that has been created as a result of poor diet and lack of exercise.

environmental temperature and either heats the house if the sensor registers too cold or cools the house if the sensor registers too hot. There is a continuous feedback loop from the sensor to the thermostat to determine what action is needed. Because the feedback loop opposes the stimulus (cools down if too hot, heats up if too cold), it is referred to as a **negative feedback loop**.

The body also relies on negative feedback loops that continually sense the internal and external environment and the body makes adjustments to maintain homeostasis (see Figure 2–4). The hypothalamus in the brain represents

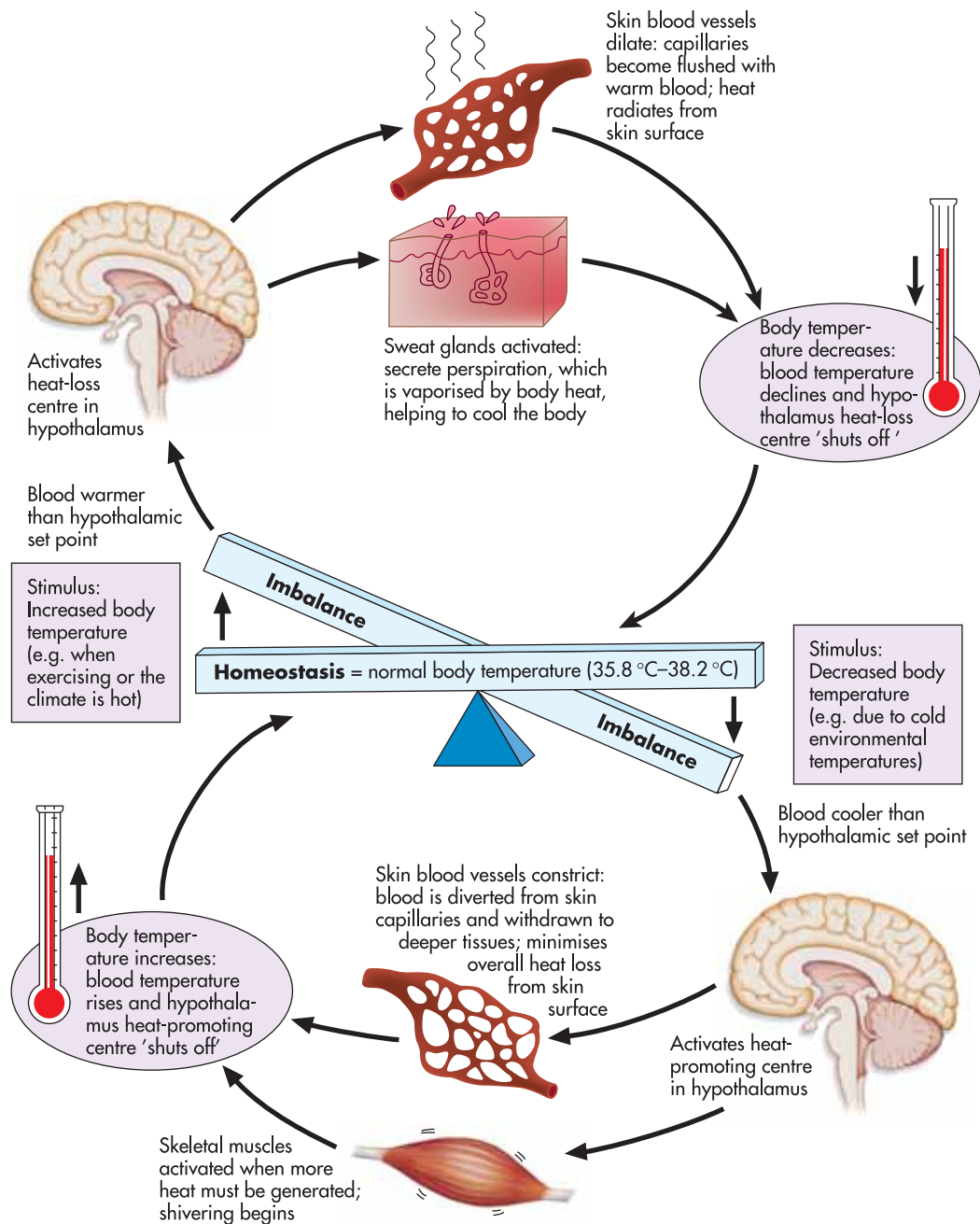


FIGURE 2–4

Mechanisms of body temperature regulation. (Source: Marieb, E.N. and Hoehn, K. (2007) *Human anatomy and physiology*, 7th edn. Pearson Benjamin Cummings.)

Amazing body facts



BIZARRE SIGNS AND SYMPTOMS!

Here are some strange signs and symptoms that have been indications of diseases. Note that there are other signs, symptoms and tests to determine specific diseases. So do not use this list of oddities as a sole diagnostic tool!

1. Generalised itching skin can be an indication of Hodgkin's disease.
2. Sweating at night may indicate tuberculosis.
3. A desire to eat clay or starchy paste may indicate an iron deficiency in the body.
4. Breath that smells like pear drops or a fruit-flavoured chewing gum may be an indication of diabetes.
5. A magenta coloured tongue is indicative of a riboflavin deficiency.
6. A patient with profound kidney disease often doesn't have moons (cuticles) on his or her fingernails.
7. A hairy tongue may mean that a patient's normal mouth flora has died from improper use of antibiotics.
8. Spoon-shaped fingernails may point to an iron deficiency in the body.
9. Brown linear streaks on the fingernails of fair-skinned people may indicate melanoma (skin cancer).

the body's thermostatic control. If the hypothalamus senses a very cold environment, it opposes this cold stimulus (negative feedback loop) and performs physiologic processes to gain heat within the body to maintain an internal temperature near 37.0°C. The body begins to shiver, and this increased muscular activity generates heat. In addition, since most heat loss is through peripheral areas (head, arms and legs), the body decreases the size of the peripheral blood vessels (vasoconstriction), causing the blood to be deeper from the skin surface where the heat would be lost to the cold environment. This keeps the blood closer to the core of the body where it is warmer. Of course, we can assist the body by wearing a heavy coat and hat, which would remove much of the stress of the cold environment, or simply get out of the cold to a warmer environment.

Conversely, if you are in the desert and the temperature is 50°C, the body senses this as too hot and stimulates physiologic processes to cool you down. These processes include sweat-

ing (evaporation is a cooling process) and enlarging the peripheral vessels (peripheral vasodilatation) in order to radiate the body heat into the external environment. In health care practice, if a patient presents with a very high temperature, then measures can be employed to assist in reducing the high temperature. This may include the administration of an antipyretic medication or the provision of a rotating fan in order to make the individual feel more comfortable. What is important is that the cause of the high temperature is determined. Much of health care practice is just that – assisting the body in returning it to homeostasis.

Your body is also capable of **positive feedback**, which increases the magnitude of a change. This process is also known as a vicious cycle. Positive feedback is not a way to regulate your body, because it increases a change away from the ideal set point. Often, positive feedback is harmful if the vicious cycle cannot be broken, but sometimes positive feedback is necessary for a process to run to completion.

A good example of necessary positive feedback is the continued contraction of the uterus during childbirth. When a baby is ready to be born, a signal, not well understood at this time, tells the hypothalamus to release the hormone oxytocin from the posterior pituitary (neurohypophysis). Oxytocin increases the intensity of uterine contractions. As the uterus contracts, the pressure inside the uterus caused by the baby moving down the birth canal increases

Clinical application



'BREAKING' A FEVER

It is believed that most fevers are the body's way of making an inhospitable environment for a pathogen to survive. Why is it when someone begins sweating after a prolonged fever (increase in body temperature), the fever is said to be 'breaking'? A fever sets the hypothalamus to a higher set point temperature. The body then increases the metabolism to generate more heat to reach this new higher temperature. Once whatever is causing the fever is gone, the hypothalamus set temperature is turned back down to the true normal. The body must now rapidly get rid of the excess heat by the cooling process of evaporation through sweating.

the signal to the hypothalamus. More oxytocin is released, and the uterus contracts harder. Pressure gets higher inside the uterus, the hypothalamus is signalled to release more oxytocin and the uterus contracts yet harder. This cycle of ever-increasing uterine contractions due to an ever-increasing release of oxytocin from the hypothalamus continues until the pressure inside the uterus decreases – that is, until the baby is born. Once that happens, the levels of oxytocin reduce.

SUMMARY

Snapshots from the journey

- Anatomy is the study of the actual internal and external structures of the body, and physiology is the study of how these structures normally function. Pathology is the study of the disease processes by which abnormal structures and abnormal body functions can occur.
- Medical terminology is the language of medicine and combines word roots, prefixes and suffixes to construct numerous medical terms to describe conditions, locations, diagnostic tools, and so on.
- The metric system is the mathematical language of medicine based on powers of 10. If you require more practice with this system, please refer to your student *Study Success Companion*.
- Metabolism refers to all of the chemical operations going on within the body and can be broken down into two opposite processes. The building phase of metabolism is anabolism, in which simpler compounds are *built up* and used to manufacture materials for growth, reproduction and repairs. The tearing down phase is catabolism, in which complex substances are *broken down* into simpler substances, such as food broken down for energy use.
- The body tries to maintain a balanced or stable environment called homeostasis. It must constantly monitor the environment and make changes to maintain this balance. It often accomplishes homeostasis through negative feedback loops.

CASE STUDY



A 66-year-old Asian male involved in a car accident is taken to the ITU with SOB and abdominal pain. He has acrocyanosis, tachycardia and a past medical history of cardiopathy. He weighs 68 kg and is 170 cm tall. His chest X-ray shows an enlarged heart. His facial injuries will require future rhinoplastic surgery. An electrocardiogram and abdominal X-ray are ordered.

a. Where exactly in the hospital was the patient taken?

b. Describe the patient's colour, heart rate and breathing.

c. What is the medical term for what the X-ray showed?

d. What future facial surgery will he need?

REVIEW QUESTIONS

Multiple choice

- Which of the following is an example of microscopic anatomy?
 - viewing an X-ray
 - examining the shape of an organ during an autopsy
 - classifying a type of bacterial cell
 - watching how the pupils in the eyes react to light
- Acromegaly means which of the following?
 - a large stomach
 - enlarged extremities
 - an inflamed stomach lining
 - a large acrobat
- The breakdown of sugar in the body for energy is called
 - anabolism
 - catabolism
 - dogabolism
 - hyperbolism
- Which of the following is a measurement system based on the power of 10?
 - English system
 - British Imperial system
 - metric system
 - weights and measures system
- The cause of a disease is referred to as the
 - prognosis
 - diagnosis
 - pathology
 - aetiology

Fill in the blanks

6. Ted's knee injury occurred at last night's football game. Today his doctor wants to make a small incision and use a device to 'look around the joint' to assess the damage. What is the term for this device? _____
7. _____ is the study of the structures of the body, and _____ is the study of the functions of these structures.
8. For years, Ali never learned to swim because of her unnatural fear of the water, which is called _____.
9. Pulse and temperature represent two _____ signs of the body.
10. Raheem had blood tests carried out that showed a normal number of white blood cells (WBCs) and red blood cells (RBCs). What are the respective medical terms for these cell types?

Short answer

11. Explain the difference between diagnosis and prognosis.

12. Knowing that difficulty swallowing is called dysphagia, what do you think the function of a phagocyte is?

13. Contrast negative and positive feedback loops.

14. Describe one example of homeostasis in your body.

SUGGESTED ACTIVITIES

1. Using a medical dictionary, find five new medical terms and give their definition.

2. Make up 3×10 -cm note cards with five word roots discussed in this chapter and see how many medical words you can make using either prefixes or suffixes in the tables. For example, the word root arthr/o can be used to make the following: arthritis, arthralgia, arthroscope and arthroplasty. Confirm that you made a real word by looking it up in a medical dictionary.