



UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

2023-2024



HEALTH SCIENCES TEXTBOOK



Health Sciences

Textbook

Grade 11

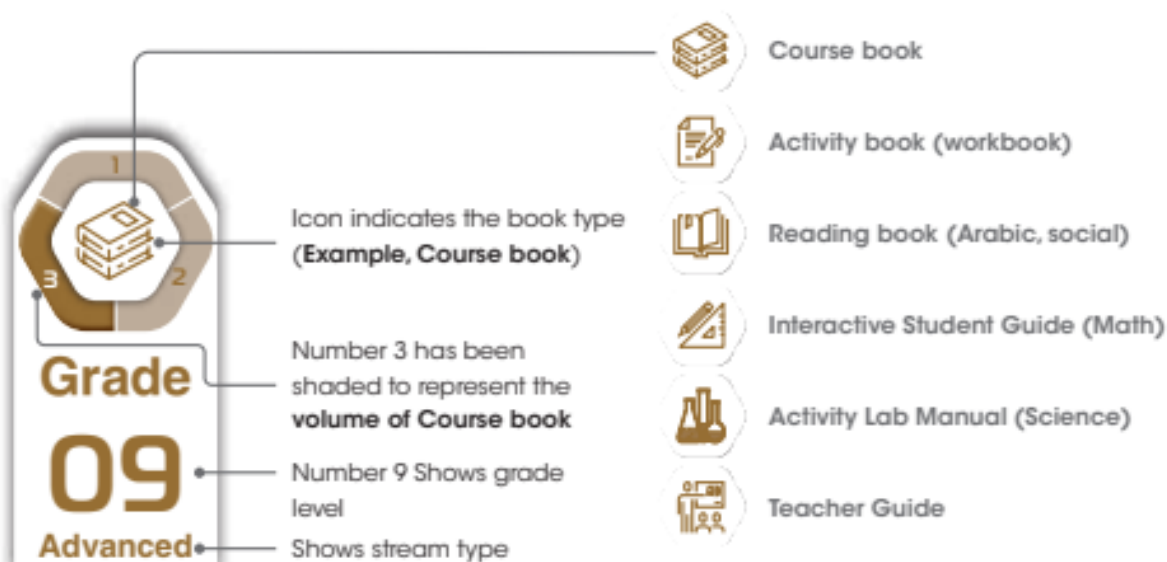
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How to use this book



Video

Indicates access to a video to support learning.



Remember

An important fact to remember.



Keyword

Provides an explanation of a language term and expression.



Example

A real life example that demonstrates the unit information.



Did you know?

Bite size pieces of interesting information related to the topic.



Think

Take time to reflect on the presented information.



Research

Research information on specific questions related to the topic.



Discussion

Discuss the highlighted topic with your class.



Further information

Additional information to expand your knowledge of this topic.

Contents



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Introduction to health	6
1.1 Health and illness	10
1.2 The dimensions of health	14
1.3 Physical health	18
1.4 Social health	22
1.5 Mental health	24
1.6 Emotional health	28
1.7 Principles of human growth and development	32
First aid	38
2.1 first aid	42
2.2 First aid kits	46
2.3 Attending the scene of an emergency	50
2.4 Hygiene and infection control	56
2.5 Bleeding	62
2.6 Soft tissue injuries	64
2.7 Wound dressings	68



Anatomy and physiology	74
3.1 Homeostasis	78
3.2 Human tissue.....	82
3.3 The musculoskeletal system	86
3.4 The circulatory system	92
3.5 The respiratory system	96
3.6 The nervous system.....	100
3.7 The digestive system	104
3.8 The immune system.....	108
Healthcare and ethics.....	112
4.1 Healthcare professionals	116
4.2 Health services	122
4.3 Outpatient and inpatient care.....	126
4.4 Patient rights and responsibilities	130
4.5 Ethics in healthcare	134
4.6 Patient confidentiality.....	140
4.7 Patient safety	142



UNIT 1

Introduction to health

- 1.1** Health and illness
- 1.2** The dimensions of health
- 1.3** Physical health
- 1.4** Social health
- 1.5** Mental health
- 1.6** Emotional health
- 1.7** Human growth and development

Introduction

Health is more than the absence of disease. The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Physical, social, mental and emotional health all contribute to overall health. When one of the dimensions of health is affected, it can have an impact on the other areas of health.

Health and well-being are not just something to study and leave in the classroom. It is something that should form a positive habit in your day-to-day life. Health and well-being are important elements for quality of life and are fundamental for learning and development.

In this unit, you will learn about four of the dimensions of health: physical, social, mental and emotional health and factors that may influence overall health and well-being. You will also learn about human growth and development, as well as the changes we go through at each stage.



Learning outcomes

Standard HSC.1.1.01: Summarise the different factors that affect health.

Learning outcomes:

- HSC.1.1.01.001 Explain the concept of health and illness
- HSC.1.1.01.002 Identify the four dimensions of health (physical, social, mental and emotional).
- HSC.1.1.01.003 Explain how the four dimensions of health affect each other.
- HSC.1.1.01.004 Describe the factors that contribute to physical health.
- HSC.1.1.01.005 Describe the factors that contribute to social health.
- HSC.1.1.01.006 Describe the factors that contribute to mental health.
- HSC.1.1.01.007 Describe the factors that contribute to emotional health.
- HSC.1.1.01.008 Define the stages of human growth and development.

Keywords

Word	Form	Definition
absence	noun	being away from a person or thing
adolescence	noun	the transition between childhood and adulthood
barrier	noun	something that can prevent movement or access
chronic disease	noun	a long-term disease that usually needs ongoing medical treatment
communication	noun	exchanging of information by speaking, writing, or using some other medium
development	noun	the process in which someone or something grows or changes and becomes more advanced
dimensions of health	noun	the aspects that can affect health
disease	noun	a disorder of the structures or functions of the body that produces specific symptoms
emotion	noun	a strong feeling that is based on personal experiences
foetus	noun	an unborn baby that is developing
growth	noun	the process of change; increasing in size
infant	noun	a young baby; generally up to one year old
mental	adjective	relating to the mind
physical	adjective	relating to the body
puberty	noun	the period during which adolescents reach physical maturity
relationship	noun	how two or more people or things are connected
social	adjective	relates to society, the community and other people
socio-economic	adjective	relating to social and economic factors
thoughts	noun	ideas or opinions

1.1 Health and illness

Health

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or illness."



Research: The World Health Organization (WHO)

You will see the WHO mentioned a lot when you study Health Sciences. Do some research about the WHO.



World Health Organization

According to the WHO's definition, health does not simply mean "not to have a disease or an illness", it is much more than that. Health involves our bodies, our minds and emotions, our social lives, our surroundings and our environment.



Discussion

Based on the WHO definition of health, do you think it's easy or difficult to be completely healthy all the time?

The WHO definition was created in 1948, and since then the world has changed a lot. For example, the way we live and how long we live have changed, so has our environment and the healthcare system that countries have. All of this and other things influence our health.



Example

In 1971, when the United Arab Emirates was formed, the average years that people were expected to live was up to 62 years. Now, 50 years later in 2020, people are expected to live up to 78 years.

In Health Sciences you will learn about different aspects of health, you will not only learn “how to be healthy”, but you will also learn about the human body and mind, digital health, environmental health, how to stop a disease from happening, how to manage a disease that is happening and how to help somebody who had an accident or an emergency. All of this and much more will be taught in this subject.



In this subject there are some key terms that are often used when exploring health. A few of these terms are listed below:

Key term	Meaning
Well-being	being healthy and feeling good.
Prevention	how to stop a disease from happening.
Mental health	this refers to a person's emotions and feelings.
Social health	this refers to a person's relationships and interactions with others, such as family and friends.
Life expectancy	the average number of years that a person or people are expected to live.

1.1 Health and illness

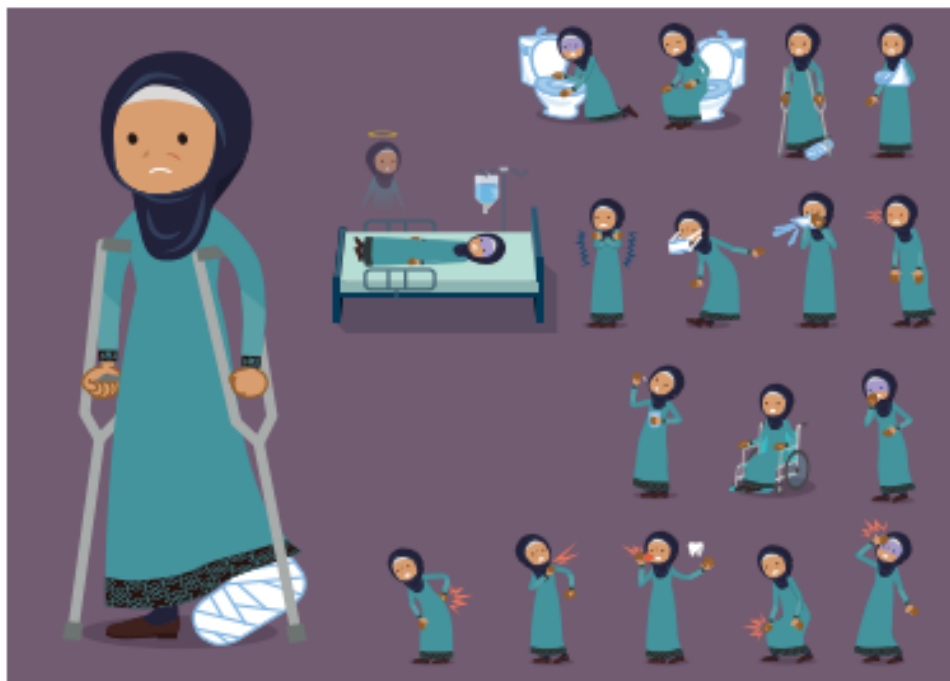
Illness

Illness can be defined as a disease of the body (physical) or mind (mental). Therefore, illness can come in many forms.



Think

Can you think of examples of illnesses that can affect our bodies and our minds? Write a few and share them with your class.



When a person has an illness, other parts of their health might be affected. For example, a physical illness (an illness of the body) can affect mental health or social health.

In Health Sciences you will learn about many different illnesses. You will gain knowledge on how these illnesses appear in our bodies, how to treat these illnesses and more importantly how to prevent them from happening in the first place.



Keyword

treat

manage or deal with a disease or illness

In this subject there are some key terms that are often used when exploring health. A few of these terms are listed below:

Key terms	Meaning
Disease	a disorder of the structures or functions of the body that produces specific symptoms.
Symptoms	a manifestation of a disease or illness felt by a person. For example, pain and fatigue (tiredness).
Sign	A manifestation of a disease or illness that can be measured by a doctor. For example, fast heart rate.
Risk factors	characteristics or behaviours that increase the possibilities of having a certain illness or disease.
Acute disease	a disease that happens suddenly and it lasts for a short time. For example, cold.
Chronic disease	a long-term disease that usually needs ongoing medical treatment. For example, heart disease and diabetes.
Communicable diseases	diseases that can pass from one person to another. For example, influenza and COVID-19.
Non-communicable diseases	diseases that cannot pass from one person to another. For example, cancer, heart diseases and diabetes.



Discussion

A lot of people in the world are living with a chronic disease, for example diabetes. Many of these people are managing their disease very well and it is not affecting their everyday life. Do you think these people can be considered healthy? Think about the WHO definition of health when you discuss this.

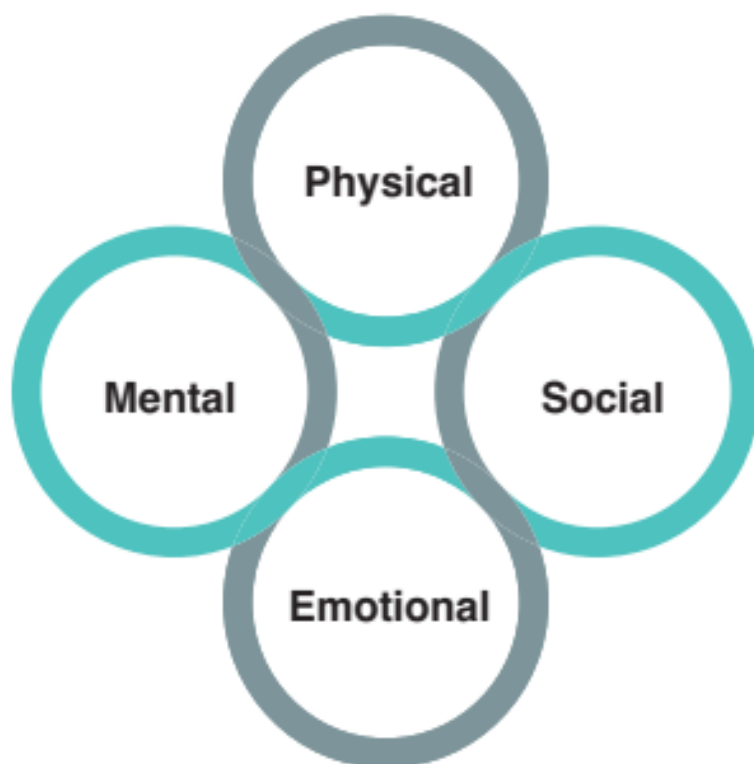
1.2 The dimensions of health

What are the dimensions of health?

The dimensions of health are the different areas that make up overall health. Each dimension can affect the others.

The dimensions of health include the following:

- ⊙ **Physical health** – refers to any physical aspect of health. Physical ill-health can include diseases such as diabetes, heart disease and cancer. It can also include fractures or other physical injuries to the body.
- ⊙ **Social health** – refers to the ability to build and keep relationships. In order to do this, a person must have good communication skills. Each person will have a lot of relationships. These include family, friends and people in your school such as classmates and teachers.
- ⊙ **Mental health** – refers to the functioning of the brain. This includes how we think, feel and act. It determines how we manage stress, deal with other people and our mood. Mental health has a direct impact on all the dimensions of health.
- ⊙ **Emotional health** – refers to feelings and emotions. This can be confused with mental health. Being emotionally healthy means a person can identify and manage their emotions and deal with them in a healthy way.



How do the dimensions of health affect each other?

All of the dimensions of health are important; individually and all together. The state of health in one dimension of health will have an impact on the other dimensions. Illness can affect one dimension, or all of them.



Example

Someone who has recently been diagnosed with diabetes may not be fully confident in managing their condition. This may affect their mental health as they may feel anxious when choosing the right foods for their condition. Their emotional health may suffer as they may feel that they can no longer eat foods that they enjoy and make them happy. This can also affect their social health as they may not feel comfortable eating out with friends or in social situations.

From the example, it is quite easy to see that the dimensions of health can very quickly have a 'domino effect' on each other.



Keyword

domino effect

a situation where one effect causes a series of similar effects to happen



1.2 The dimensions of health

Barriers to health

It is very difficult to say if a person is completely 'healthy' or 'unhealthy'. They might be physically healthy but not emotionally or mentally healthy.



Think

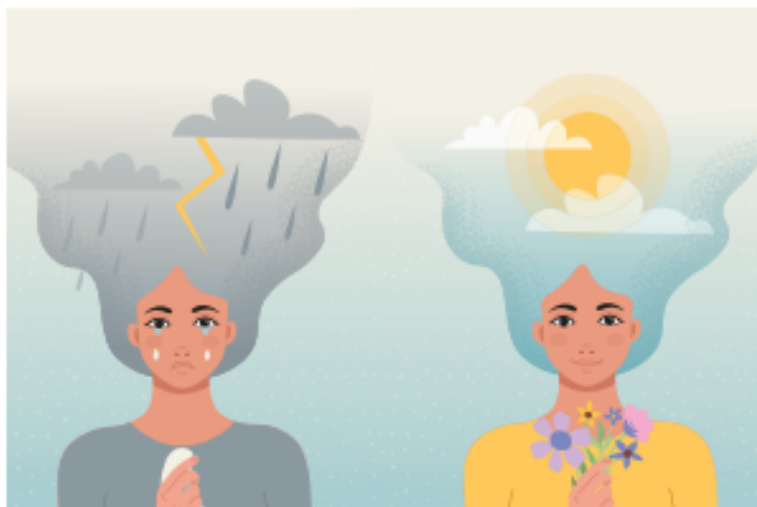
Think of a reason why your emotional health might change from feeling sad to feeling happy.

Everyone's health status is changing all the time. There are many challenges within the environment that can affect your state of health. These are known as barriers. Barriers to health are things that affect health that you as an individual cannot control.

Let's look at some of the barriers to health:

The weather

The weather has been proven to impact people's mood – when the weather is nice, people feel happy so their emotional health improves. The weather can also impact the ability to do physical activity. In the summer months it is very hot and humid, so people may find that they exercise less.



The local healthcare facilities

Depending on the local area, it could be very far to the nearest hospital or emergency facility. This might stop people from getting the medical treatment they need, especially in an emergency.

Other people's behaviour

As humans, we usually copy each other. However, the way in which other people behave can have a negative impact on some dimensions of health. Doing things due to peer pressure is an aspect of emotional health which, depending on the situation, can cause damage to physical health.



Keyword

peer pressure

a feeling that you must do the same things as people in order to gain their respect



People spreading gossip or rumours can also be quite damaging to mental health. Spreading rumours about other people, or current affairs (events happening in the world right now) can lead to emotional, social and mental health problems.

The food available

The choice of food available is different from place to place. In times of a crisis, people might panic and buy a lot of food items. This would then leave a shortage of stock for other customers. Fruit and vegetable growers may have periods of bad weather, so they do not grow as many crops as normal. This would result in a shortage in supply in shops. The shortage of food available may lead to physical illnesses, as well as mental and emotional illness.

1.3 Physical health

Physical health



Discussion: What is physical health?

Discuss your understanding of physical health with your class.

Physical health refers to how the body works. When people are physically healthy, they have the ability to complete everyday tasks. To be physically healthy, people might avoid doing things that could damage their body.

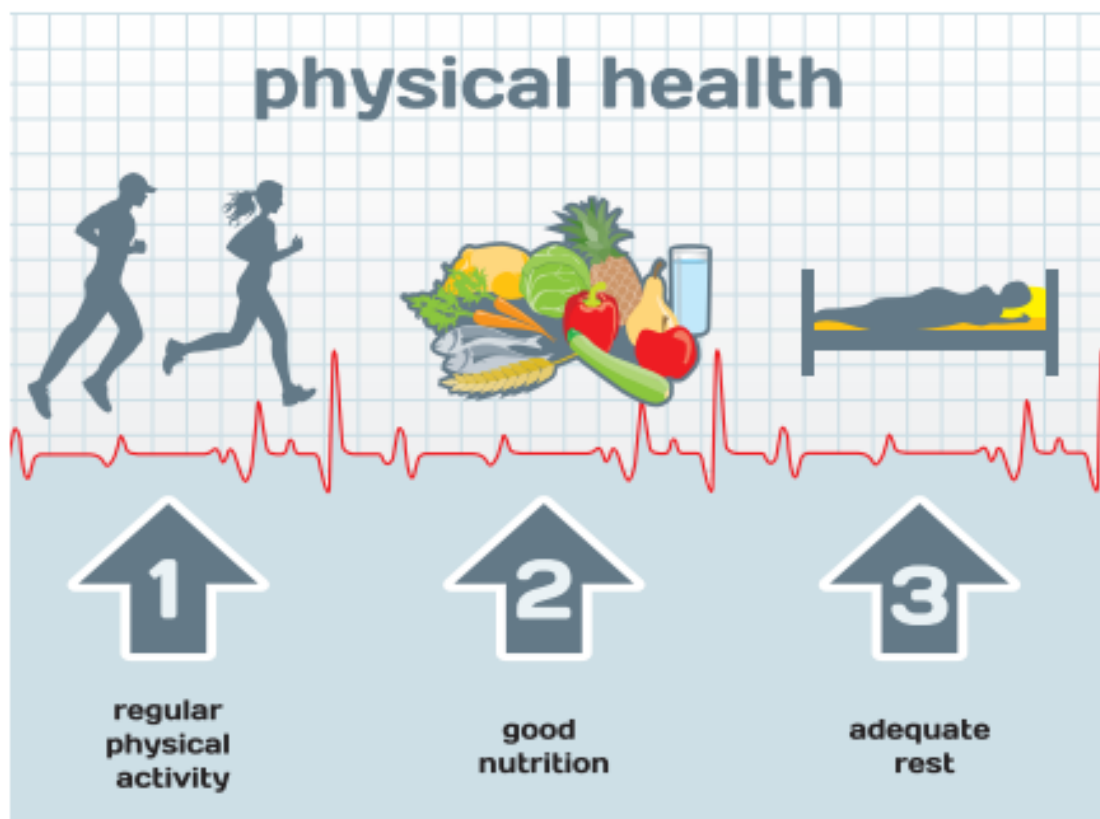


Keyword

damage

something that hurts someone, such as an injury

Physical health is not just the absence of disease. There are many other factors that can contribute to physical health.



How to improve physical health

Physical health is important for overall health. It is the easiest dimension to see or notice. Physical health can have an impact on social, mental and emotional health.

Eat a healthy balanced diet

A balanced diet will help to improve all dimensions of health. Healthy balanced diets should include the right amount of carbohydrates, proteins, fats, vitamins and minerals. These nutrients should come from many different types of foods.

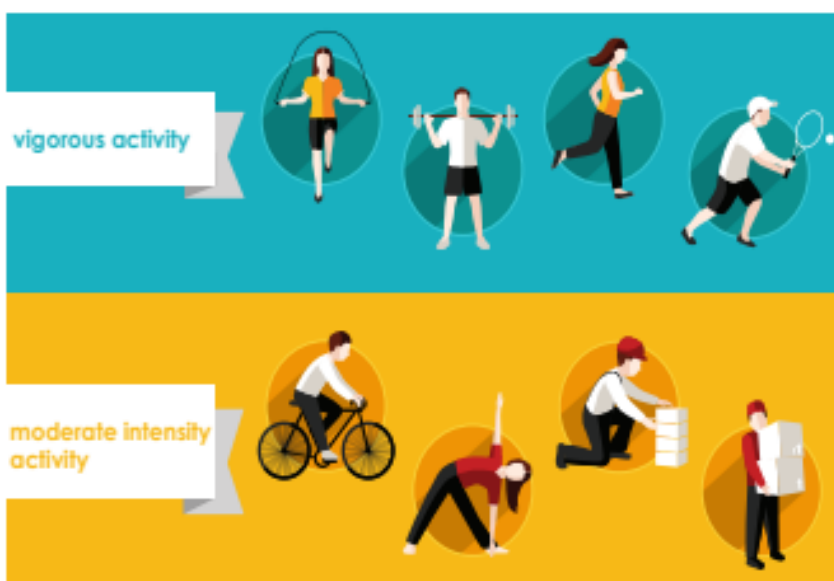


Do enough physical activity

Doing regular physical activity has many health benefits. Physical activity can help to reduce the risk of developing certain diseases. It can also help people manage illness, and improve mental and emotional health. There are many different types of physical activity that you can do, ranging from walking to playing sports.

The WHO defines physical activity as “any bodily movement produced by skeletal muscles that requires energy expenditure.”

Adults should do at least 75 minutes of vigorous (more intense) activity per week, or at least 150 minutes of moderate intensity activity per week.



1.3 Physical health

Stay hydrated



Keyword

hydrate

to give water or moisture to the body

Our bodies are made up of approximately 60% water, so staying hydrated is very important for physical health. Staying properly hydrated helps the body's cells to function (work) properly. Water is the best form of hydration as it does not damage your teeth in the same way sugary drinks do. Water does not contain caffeine like coffee or tea do.



Avoid harmful substances

Substances that have an impact on how the brain works or other body processes should not be used. Caffeine should only be consumed in moderation (small amounts).



Keep a healthy body weight

It is very important to keep a healthy body weight. A healthy body weight depends on a person's age, gender and height. There are also many factors that affect our weight, such as; diet, physical activity, family history and genetics.

Get enough sleep

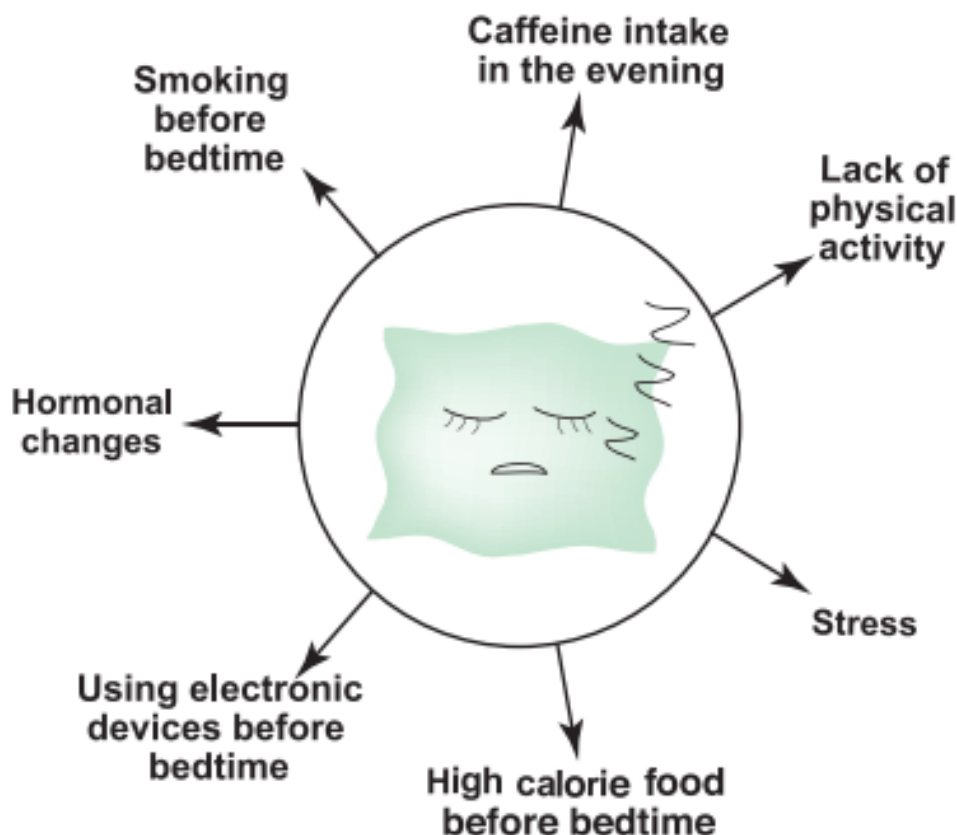
People need to have good quality rest and sleep to stay healthy. It is important to spend time relaxing to help refresh the body. Sleep should take place in a quiet and dark place.

Most people need to get 7-9 hours of sleep every night. Not sleeping for long enough or getting poor quality sleep for a long period of time can have negative effects on health.

There are many factors that lead to poor quality sleep. These include the following:

- ⊙ Having caffeine or sugary foods before going to bed
- ⊙ Not doing enough physical activity
- ⊙ Eating large amounts of food before going to bed
- ⊙ Using mobile phones and other electronic devices before going to bed

Causes of poor sleep



1.4 Social health

What is social health?

Social health is the part of health that refers to how well people build relationships or friendships with other people. Social health focuses on creating and maintaining healthy and supportive relationships with family, friends and peers.



Having a social support network protects people against many physical health problems. Good relationships should include strong communication, caring for others and a sense of responsibility.

Ways to improve social health include:

- ⊙ spending time with friends and family.
- ⊙ enjoying the time spent with others.
- ⊙ keeping positive.
- ⊙ keeping positive relationships.
- ⊙ ending negative relationships.

There are many benefits that come from having strong relationships with others. Social health is just as important as physical health.

Building and keeping relationships

People have many relationships. They can be with family, friends and people within our school or community. Some of these relationships are ones that they choose; for example, friendships. Others are ones that people don't choose; for example, your classmates.

Positive relationships can be good for your health, but they can take time and effort. To develop relationships and keep good social health, you should do the following things:

1. Give your time, effort and energy to conversations with other people.
2. Have a good level of self-esteem. This means feeling good about yourself and who you are as a person. This will help you build good relationships
3. Be yourself. People should not change who they are or their characteristics. Being true to yourself will make for better relationships.



Good communication

Good communication is an important part of social health. It can help to make relationships stronger. When people communicate, they must get their message across clearly to the other person. The person receiving the message must understand the message for communication to work. Both the words that you use, and how you use them (for example, body language and tone of voice) are very important.



1.5 Mental health

What is mental health?

Mental health is relating to the brain and how well it works. The way in which we think, feel and behave show our level of mental well-being. The WHO say that mental health is more than the absence of a mental illness. Just like physical health, sometimes people can develop disorders related to their mental health.

Common mental health disorders include:

- ⊙ Depression
- ⊙ Bipolar disorder
- ⊙ Anxiety disorders
- ⊙ Eating disorders
- ⊙ Dementia
- ⊙ Developmental disorders (for example autism)



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Causes of mental health disorders

There isn't one single cause of mental health disorders, in fact, there are thousands of causes.

The causes of mental disorders usually fit into one of three categories:

- ⦿ Biological factors – a family history of mental illness, or having a chemical imbalance, which means having too much or too little of certain chemicals in the brain.
- ⦿ Psychological factors – factors that impact someone's personality. This is usually influenced by events and experiences during childhood.
- ⦿ Social factors – things that happen to a person's environment, it could include family life, relationships with friends, or personal experiences.



These factors are also connected with each other. Your biological, psychological, and social factors are unique to you. No one else has experienced things in the exact same way as you have or felt the same way about each event in your life.



Discussion: Mental health

Discuss with your class how you think mental health can impact the other dimensions of health.

1.5 Mental health

Stigma and discrimination

Stigma is when someone sees you in a negative way because of a particular characteristic, such as skin colour, cultural background, a disability or a mental illness.

Discrimination is when someone treats you in a negative way because of a particular characteristic, such as your mental illness.



Stigma happens when a person identifies someone by their illness rather than who they are as an individual. For example, they might be labelled 'crazy' rather than 'a person experiencing bipolar disorder'.

For people with mental health issues, the stigma and discrimination they experience can make their problems worse, making it harder to recover. It may cause the person to avoid getting the help they need because of the fear of being stigmatised.



The harmful effects of stigma

Some of the effects of stigma include:

- ⊙ feelings of shame, hopelessness and isolation.
- ⊙ refusing to ask for help or to get treatment.
- ⊙ lack of understanding by family, friends or others.
- ⊙ fewer opportunities for employment or social interaction.
- ⊙ bullying or physical violence.
- ⊙ self-doubt – the belief that you will never recover from your illness or be able to achieve what you want in life.

Dealing with stigma

It is everyone's responsibility to break down the stigmatisation of mental illness.



Here are some ways to stop the stigma:

- ⊙ Do not let fear of being labelled with a mental illness stop you from getting help.
- ⊙ Mental illness is not a sign of weakness and it is not something that you can deal with alone. Talk about your mental health with healthcare professionals.
- ⊙ Reach out to people you trust such as family, friends or teachers. They can give you the support that you need.
- ⊙ Connect with others who feel the same way as you. This can help you to realise that you are not alone in your feelings.
- ⊙ Remember that other people's judgements come from a lack of understanding of mental illness. Do not believe that their views reflect you personally.

You will learn more about mental health throughout this year in your Health Sciences lessons.

1.6 Emotional health

What is emotional health?

Emotional health is often confused with mental health. Both dimensions of health are very similar, and they can impact each other, as well as the other dimensions of health.

Emotional health is how people feel about themselves and how they manage their feelings as they deal with challenges in life.



What are emotions?

Emotions are related to feelings. They are caused by the situation a person is in or the people they are with. The table below shows some examples of emotions.

Emotions				
Angry	Annoyed	Anxious	Embarrassed	Excited
Fear	Happy	Hurt	Jealous	Joy
Lonely	Nervous	Sad	Surprised	Upset

Sometimes people get mixed up between emotions and thoughts. For example, a person might do something and say they feel stupid. Stupid is a thought, not an emotion. The emotion they may feel is embarrassed. The person is telling themselves that they are stupid, and that's why it is a thought.

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The importance of emotional health

Improving emotional health is just as important as improving physical health. People who work on their emotional health have:

- ⊙ **stronger relationships.** When you have the skills to manage your emotions, it is easier to connect with other people and show more empathy. You are able to talk through your feelings instead of causing arguments.
- ⊙ **higher self-esteem.** Your thoughts, feelings and experiences will change the way you feel about yourself. Good emotional health will help you to see the best in yourself even on your worst days.
- ⊙ **more energy.** A positive outlook makes you feel energised, helps you to focus and think clearly. Poor emotional health can cause exhaustion.

How to improve emotional health



Remember

Having good emotional health does not mean you are always happy or free from negative emotions. It's about having the skills and ability to manage the ups and downs of everyday life.

Practise emotional regulation

Emotions can sometimes get the best of you but learning some ways to cope can help you to respond positively in upsetting situations.

Some ways to regulate your emotions include:

- ⊙ Meditation
- ⊙ Listening to music
- ⊙ Talking to a friend or family member
- ⊙ Writing a journal
- ⊙ Reading a book
- ⊙ Practicing breathing exercises
- ⊙ Doing yoga



1.6 Emotional health

Exercise

Taking time for physical activity can improve your emotional and physical health. Any sort of physical activity, even going on a 15-minute walk, can help to clear the negative thoughts in your head, especially if you are stressed, worried or upset about something.



Strengthen connections

Your social health has a big impact on your emotional health. Staying connected with family and friends can help when you face challenges, as they can give advice and support. This can be done by spending time with family and friends either in person or over the phone.

Be mindful

A lot of research has shown that mindfulness has been linked to better emotional health. Mindfulness can be as simple as focusing on one thing at a time, stop using your phone or social media for a while, or taking a mental break from your studies to do some practical tasks. You only need to give a few minutes to this every day.





1.7 Human growth and development

The human life cycle

Human development is a process that happens continuously throughout life. The human life cycle is divided into different stages:

- ⦿ foetal development
- ⦿ infancy
- ⦿ childhood
- ⦿ adolescence
- ⦿ adulthood
- ⦿ older adulthood



Foetal development



Keyword

foetus

developing baby that has not been born yet

The first stage of the human life cycle starts before a baby is even born.

A human starts life as an embryo, which develops into a foetus in the womb of its mother. The foetal development stage starts around 10 weeks into pregnancy. Before the foetus is formed, there are already a lot of physical developments.





Further information

During the foetal stage, a lot of the key characteristics that started in the embryo continue to develop. The changes that happen include the following:

Weeks of pregnancy	Foetal development
13 - 16	The foetus will start to move; muscles develop, liver and pancreas secrete hormones and enzymes.
14	Develop male or female physical characteristics.
19	Heartbeat can be heard with a stethoscope.
23	Lungs and alveoli develop, the nervous system starts to function.
31	Tissues and body systems are present, more growth and development occurs until birth.
36 - 40	The foetus is ready to be born.

Infancy

An infant is a baby from birth to two years old. There are some huge changes that happen during this time. An infant's weight normally doubles in the first six months and triples by the age of one year old. Brain development is also very fast at this stage. Infants develop motor skills during this stage in line with their physical growth.



1.7 Human growth and development

Childhood

There are two stages within childhood; early childhood (between two and six years of age), and older childhood (between seven and eleven years of age).

Motor skills can be divided into two categories; gross motor skills and fine motor skills.

- ⊙ Gross motor skills use large body movements, such as running, jumping, skipping, throwing and balancing.
- ⊙ Fine motor skills use small body movements, such as writing, drawing and tying shoelaces.



In early childhood, both types of motor skills develop a lot, but gross motor skills develop a lot quicker than fine motor skills. In older childhood, both gross and fine motor skills continue to improve.



Further information

Children tend to grow about five to seven centimetres per year during childhood. This varies a lot from one age to another, and between different people. Some of the things that impact growth include gender, disease, diet, and genetics.

In early childhood, children lose some body fat. Minor illnesses can be common in early childhood as their body systems are not fully developed. Accidental injuries are also common as young children like to explore things without knowing the dangers or being scared.

Older children tend to be at a very healthy stage of life. They are stronger and more coordinated. Their immunity (how the body fights disease) has increased so they experience minor illnesses less often.

Adolescence



This is the period of change between childhood and adulthood. Each of the dimensions of health face huge changes in adolescence. Puberty is a change that everybody goes through in adolescence. This is the physical process of maturing to an adult. Some physical changes experienced during this time include:

Boys	Girls
Grow taller	Grow taller
Voice gets deeper	Hips become wider
Skin gets oily	Breasts develop
Facial and body hair grows	Menstruation cycle starts (periods)
Pubic hair grows	Pubic hair grows



Further information

The puberty stage takes different lengths of time for different people, but in general it lasts around six years. The age that puberty starts at also varies between people and between genders. Girls normally begin puberty before boys.

In general, adolescents are healthy people. However, obesity and some mental health disorders (e.g. eating disorders and depression) are common at this stage of the life cycle. This is due to adolescents trying to get used to the chemical and physical changes that are happening to their bodies. Adolescents often compare themselves to other people of the same age, particularly physically. This can also have an impact on their mental well-being.

1.7 Human growth and development

Adulthood

Adulthood starts between seventeen and nineteen years old and lasts until sixty-four. Adults are no longer physically developing and growing and instead they slowly begin to decline. There are two categories of adults, young adults (aged 18 to 44) and middle-aged adults (aged 45 to 64).



Keyword

decline

to get worse or weaker

Young adults are at their fittest and strongest stage of life. Once they enter middle-age, their motor skills and physical fitness start to decline. They also notice physical changes such as wrinkles forming.



Further information

While adults are generally still healthy at middle-age, lifestyle and socio-economic factors have a large impact on their health. Socio-economic factors include:

- ⊙ Education level
- ⊙ Income
- ⊙ Housing
- ⊙ Access to healthcare

Older adults



Older adults are aged 65 and above. They will see a decline in the following:

- ⊙ Physical fitness
- ⊙ Energy levels
- ⊙ Muscle mass
- ⊙ The immune system
- ⊙ Senses – eyesight and hearing are the most common
- ⊙ Motor skills and reflexes

The speed at which these skills decline will depend on how the person has lived over their life.



Example

Imagine an older adult who has smoked all of their life and has not done any physical activity since they were a young adult. This person will notice their decline much faster, maybe even before they enter older adulthood, compared to someone who exercises regularly and has never smoked.



Further information

Older adults find it harder to learn new things, their memory tends to get worse and they generally have more health problems than any other stage of the life cycle. Common medical conditions include:

- ⊙ Arthritis
- ⊙ Cancer
- ⊙ Dental problems
- ⊙ Hearing problems
- ⊙ Hypertension
- ⊙ Heart disease
- ⊙ Vision problems



UNIT 2

First aid

- 2.1** The purpose of first aid
- 2.2** First aid kits
- 2.3** Attending the scene of an emergency
- 2.4** Hygiene and infection control
- 2.5** Bleeding
- 2.6** Soft tissue injuries
- 2.7** Wound dressings

Introduction

Learning first aid is an important skill to develop. This skill will allow you to become a valuable member of your community. First aid can be used to help someone who has been in an accident until professional medical help arrives. This unit will provide you with skills that could possibly save a life.

You will learn about a wide range of basic first aid skills such as what to do at the scene of an accident or how to apply a basic wound dressing. It is important to learn these skills so that you can deal with accidents and emergencies effectively.

An accident or emergency can happen at any moment, often when you least expect it! The type of emergency can vary from minor (easy to deal with), to severe and even life-threatening. It is important that you have the skills and confidence to deal with any type of emergency. Remember, practice makes perfect. The more you practise, the more confident you will feel when giving first aid treatment.



Learning outcomes

Standard HSC.3.1.01: Identify the purpose of first aid and highlight the initial steps to take for a medical emergency.

Learning outcomes:

HSC.3.1.01.001 Explain the purpose of first aid and identify who can provide it.

HSC.3.1.01.002 List the contents of a first aid kit.

HSC.3.1.01.003 Demonstrate the initial steps to take at the scene of an emergency.

HSC.3.1.01.004 Apply the principles of hygiene and infection control to first aid.

HSC.3.1.01.005 Differentiate between arterial, venous and capillary bleeding.

HSC.3.1.01.006 Identify different types of open soft tissue injuries.

HSC.3.1.01.007 Demonstrate simple wound dressings.

Keywords

Word	Form	Definition
accredited	adjective	to say that something is good enough to be given official approval
artery	noun	part of the circulatory system; these blood vessels take blood away from the heart to the rest of the body
bandage	noun	material that is used to cover a dressing and hold it in place
blood vessel	noun	a tubular structure that carries blood around the body; veins, arteries and capillaries
contaminate	verb	to make something dirty by adding something harmful to it
dressing	noun	any material that is used to cover a wound; this includes a plaster, gauze or compress
emergency	noun	an unexpected and usually dangerous situation that calls for immediate action
fracture	noun	a crack or a break in a bone
illness	noun	a condition of being unhealthy in your body or mind
injury	noun	an act that causes harm or damage
internal	noun	refers to the inside of something
minor	noun	not very serious; easy to treat
severity	noun	the range of how serious a condition is
technique	noun	a certain way of carrying out a task
tourniquet	noun	a device that is used to stop the flow of blood to a limb
windlass	noun	part of the tourniquet; it is used to tighten the device around the limb
wound	noun	an injury to tissue where skin is broken, usually caused by a cut or impact

2.1 first aid

What is first aid?



Discussion: What do you already know about first aid?

In groups, discuss what you already know about first aid.

First aid is the emergency or immediate care of an injured or sick person until they can receive full medical care and treatment.

First aid is usually a short and quick treatment. For minor (small) injuries, first aid might be enough, however for major (big) injuries, first aid should be continued with expert medical care.

First aid is a very important skill to have as this can save a person's life. The skills and knowledge you will learn in this unit will help and encourage you to do a certified first aid course and become a first aider.



Keyword

certified

to be given an official certificate

First aid can be given if the injured or sick person accepts it. If the injured or sick person is unable to give permission or say ok, permission should be asked from a friend or a family member who might be with the injured or sick person. The first aider must always try not to cause any harm or damage to the injured person.

Who can provide first aid?

A certified first aider

A certified first aider can be a healthcare professional, such as a nurse or a paramedic, or any person who has completed a certified and accredited first aid course.



Keyword

accredited

when a certificate or qualification is officially recognised by an educational institution and/or the government



Did you know?

In 2020 the UAE government announced a change to the law of emergency medical care. The new law says, "if you want to give help or assistance in an emergency and the person gets harmed or injured as a result, you will not be punished.". This concept is known as the Good Samaritan Law and it protects people who act with good intentions to help people whose lives could be at danger.

2.1 first aid

How can you become a certified first aider?

You could become a certified first aider by doing a first aid training. Those trainings can be done in different places in the emirate where you live, for example you could do a first aid training through the National Ambulance in the emirate where you live.



There are different levels of first aid training, for example:

- ⊙ Basic Life Support (BLS)
- ⊙ Advanced Cardiovascular Life Support (ACLS)

Other first aid trainings could be very specific, such as:

- ⊙ First aid at work
- ⊙ Paediatric First Aid
- ⊙ First On The Scene

When choosing a first aid training, make sure that the training is accredited and recognised locally and internationally. For example, check that the training is accredited by the American Heart Association (AHA).

What are the advantages of learning first aid?

There are many advantages of learning first aid, some of those are:

1. Safer community

Communities that have a lot of people trained in first aid, will be a safer community. The first aid skills you will gain in Health Sciences and after completing a first aid training will become a very big help to you community, family and friends. If there is ever an emergency, you will be prepared and ready.



2. Life-long skills

The skills and benefits that you will have in your first aid training will be useful for all your life. Those skills will be useful at home, at school and in your community.

3. Saving lives

The skills you learn could make you become a hero and save somebody's life. That person could be a family member, a friend or even a stranger. Imagine how proud your community and country would be of you if you save somebody's life?

4. Increasing confidence

When you have the skills to deal with accidents and emergencies, this will make you feel proud and confident. It will also help you stay calm and do the correct steps to help an injured or sick person.



2.2 First aid kits



Further information

Preparing your own first aid kit

You can buy a first aid kit online or from a pharmacy. If you want to create a kit for yourself or your family, here are some things you'll need to think about.

The number of people and types of injuries

Find out how many people will need the first aid kit. This will determine the number of supplies you will need to buy. You also need to think about what types of injuries you expect. The types of injuries that a sports team would expect are different from the types of injuries you expect to get at home.

Select the right container

Once you have decided on the number of people that may use the kit and their needs, you need the right size of container. All the items needed should easily fit into the first aid kit. It should also be easy to carry around if needed.

Make a checklist

A list should be made of all the items that are in the first aid kit. This will make it easier for yourself or others to check the kit has all the items needed in the future.



Maintain and restock as needed

If you use any of the contents, replace them. The kit needs to be ready for the next emergency. Check the kit for supplies that are out of date to make sure these are replaced with fresh products. If you use any of the equipment, such as the scissors, make sure to wash them before returning them to the kit.

Store in an appropriate area

During an emergency, you must act fast. Trying to think where you stored your first aid kit and searching for it is something that would take valuable time. Store the kit in a place that is easy to see and reach for adults. For example, if you are at home, attach the kit onto a wall in an area that is used often, such as a kitchen. Make sure everyone in your home knows where the first aid kit is kept and how to use it.



Research: What would you need?

Research the type and size of the first aid kit you would need for your home.

2.3 Attending the scene of an emergency

Look for dangers

The first thing to do at the scene of an accident is check that it is safe to enter.



Keyword

casualty

a person injured in an accident

Your safety is the most important thing when trying to provide first aid. If you get injured while trying to help someone then you may not be able to help at all. If you are badly injured, then you could become a casualty also.

You need to check for any danger to you or the casualty before you enter a scene.



Take a few moments to get some information about the scene and the casualty. If it is safe to do so, walk around the casualty and look for dangers.

Think	Action to take
Is there any danger for you and the casualty?	Look for obvious dangers or hazards.
Who is ill or injured?	Get an idea of how many people are injured and try to discover what happened.
Are there other people around to help?	If there are others around, ask them to call an ambulance.
Do they have any obvious major injury?	Injuries such as massive blood loss need to be treated immediately.

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A hazard is any situation with the potential to cause harm. Possible dangers at a scene could include the following:

- ⊙ Traffic
- ⊙ Unstable electric lines
- ⊙ Fire
- ⊙ Smoke
- ⊙ Violent behaviour
- ⊙ Extreme weather
- ⊙ Dangerous fumes
- ⊙ Biochemical products
- ⊙ Falling rocks



You may need to move the patient to provide first aid safely. You should only do this if it is safe to do so and you really need to. Only move the injured person if they are in danger where they are, or must be moved to be treated.



Example

Times when you should move an injured person include: if they are lying in a busy road, if there is a fire or if they are in a building which could collapse.

Assess the casualty

Are they responsive?

When you are sure it is safe to approach the casualty, the first thing to check is whether the person is responsive.



Keyword

responsive

reacting or giving an answer easily

2.3 Attending the scene of an emergency

Check to see if the person is responsive by tapping on their shoulder. Shout:

"Hello, are you ok?"



If the person is unresponsive, you need to get professional help. If you are on your own, call out for help. Shout out:

"Help, I have an injured person here, please help!"

If someone arrives, ask them to call an ambulance and get a first aid kit and AED if available. Speak in a clear, loud, and firm manner and give them all the information you have collected. Call 998 and clearly tell them:

"We have an unresponsive person. We think they might have... (tell them what you think caused the injury)."

Are they breathing?

If they do not respond, you will now need to check for breathing. Before you do this, you will need to make sure the airway is open.



Did you know?

When a person is unresponsive, their muscles relax. This could lead to their tongue blocking their airway. If this happens, they will no longer be able to breathe.

Open the airway

To open their airway, place one hand on the forehead and the fingers of your other hand on the solid part of the chin. Make sure you do not press on the soft part of the chin as this can block the airway. Then gently tilt the head back and lift the chin up.



Check for breathing

Follow these steps to check for breathing:

Put your ear close to the person's nose and mouth while you look towards their chest, to see if there are any signs of breathing.

1. **Look** to see if their chest is rising and falling.
2. **Listen** over their mouth and nose for breathing sounds.
3. **Feel** their breath against your cheek. Do this for between 5 - 10 seconds.



If they are not breathing at all, or only gasping, they need cardiopulmonary resuscitation (CPR). You will learn more about CPR in future Health Sciences lessons.

2.3 Attending the scene of an emergency

The recovery position

If the person is breathing normally, unresponsive and has no major injuries (such as a lot of blood loss), they should be put into the recovery position. This will help to maintain an open airway and keep them safe until emergency medical help arrives.

Follow the steps to place someone into the recovery position.

1. Kneel down beside the casualty.
2. Remove any phones or bulky items from their pockets.
3. Take the arm closest to you and put it at a right angle to their body (with their palm facing up).



4. Move the other arm across their chest and put the back of their hand on their cheek.



5. Lift the far knee up until the foot is flat on the floor.
6. While keeping the casualty's hand pressed against their cheek, hold the raised knee, and roll them towards you.



7. Once fully over, re-adjust the head position if needed and place the top leg at a 90° angle.



Calling for emergency medical help

If the casualty is safely in the recovery position but still no one is around to help, you should call the emergency services. Try to give them as much information as you can.

Check for any medical information jewellery. This can tell you if someone has an existing medical condition.



Once the emergency services have been called, stay with the casualty and monitor their condition until the ambulance arrives.

If the casualty starts to have trouble or stops breathing, be ready to give CPR. Update the emergency services about the casualty's condition change.



Remember

You should phone for an ambulance (998) and ask for help whenever:

- ⊙ someone is severely ill or injured.
- ⊙ you are not sure what to do in an emergency.
- ⊙ you are not qualified to give first aid.



2.4 Hygiene and infection control

Hand hygiene



Keyword

hygiene

the things that you do to keep yourself and your surroundings clean in order to maintain good health



The hands are the most common way in which germs are spread in healthcare.

There are around 1500 germs in every square centimetre of your hands. There are more than that between your fingers and under your nails.

Most people do not realise how often they touch their eyes, nose and mouth. This is how many bacteria and viruses enter the human body.

Hand hygiene is very important as it will help to stop the spread of germs which cause diseases and infections. You may think washing your hands is a very simple task, but a lot of people do not know how to wash their hands properly. The World Health Organization has guidelines for proper handwashing.

What you will need



Running water



Soap



Single-use hand towel



Discussion: Handwashing

Discuss the times when you should wash your hands in a healthcare setting (hospital or clinic).

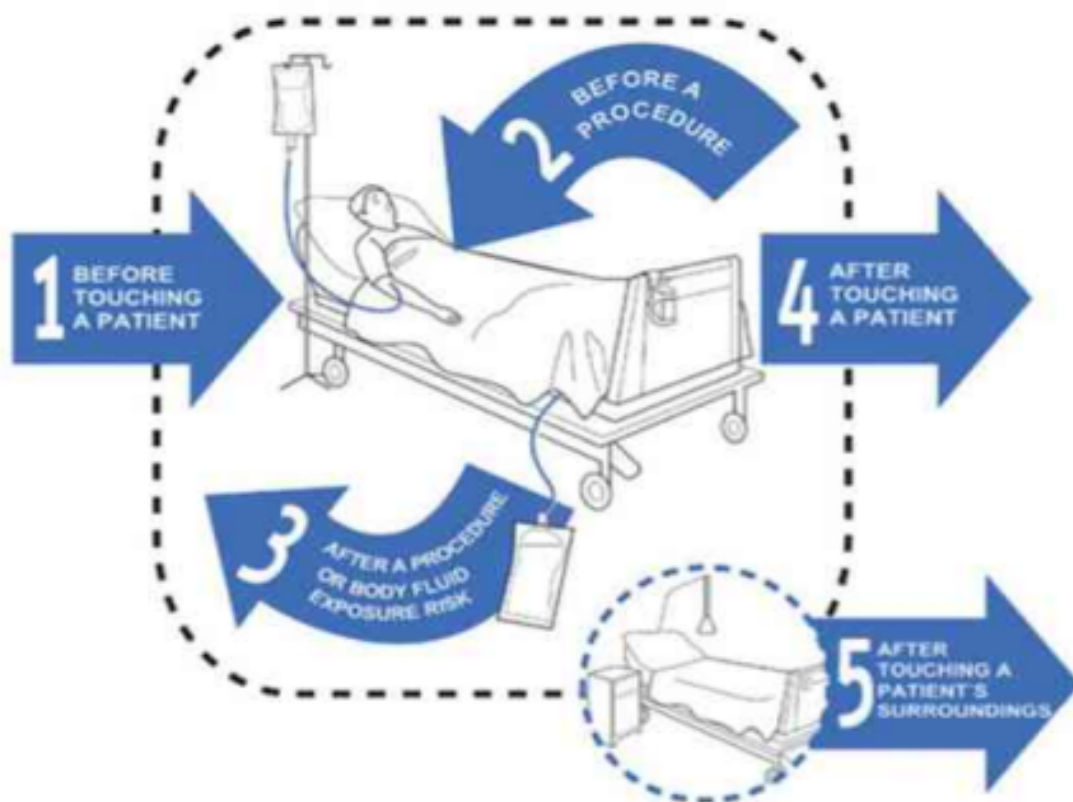


Further information

The five moments for handwashing

When it comes to patient safety, there are five moments when you should remember to wash your hands.

1. Before touching a patient.
2. Before carrying out any procedures.
3. After carrying out a procedure, or being near to or touching body fluids, such as blood.
4. After touching a patient.
5. After touching a patient's surroundings.



2.4 Hygiene and infection control

How to handwash?



Duration of the entire procedure: 40-60 sec.



Wet hands with water



apply enough soap to cover all hand surfaces.



Rub hands palm to palm



right palm over left dorsum with interlaced fingers and vice versa



palm to palm with fingers interlaced



backs of fingers to opposing palms with fingers interlocked



rotational rubbing of left thumb clasped in right palm and vice versa



rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.



Rinse hands with water



dry thoroughly with a single use towel



use towel to turn off tap



...and your hands are safe.



World Health Organization

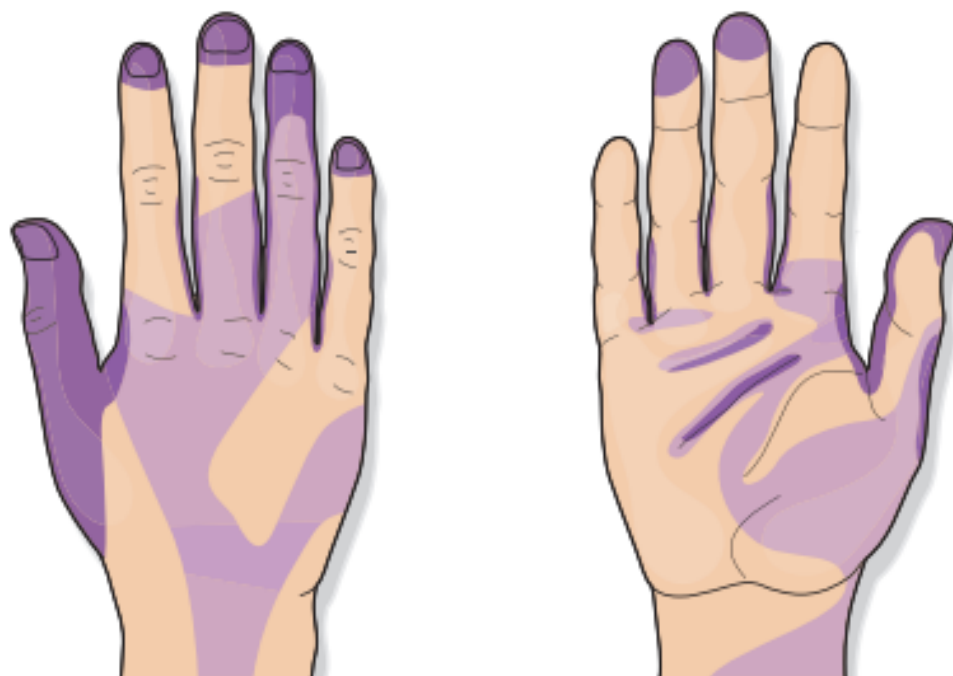


Video: Handwashing

Watch the video about handwashing.



The image below shows the areas that people often miss when washing their hands. Think about the areas coloured purple the next time you wash your hands to make sure you are doing it properly.



	Most frequently missed		Frequently missed		Less frequently missed
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2.4 Hygiene and infection control

Personal protective equipment (PPE)

When providing first aid treatment, there is a chance that you will come into contact with hazardous substances or body fluids such as blood. By wearing personal protective equipment (PPE) you can make sure these substances don't enter your body.

PPE for first aid can include:

- ⊙ gloves
- ⊙ masks
- ⊙ gowns
- ⊙ overalls
- ⊙ eye protection

Each item is designed to protect a certain area from becoming contaminated.



Keyword

contaminate

to make something impure by adding something harmful to it



Gloves

Gloves are found in most first aid kits. As you already know, the hands are one of the main ways that germs are spread. Gloves protect both you and the person you are treating. You are protected from their body fluids while they are also protected from the germs on your hands. This is especially important if they have a wound.

Important points to remember about gloves:

- ⦿ Always wear gloves when treating someone (even if you cannot see any blood).
- ⦿ Do not wear the same gloves when treating different people.
- ⦿ Wash your hands straight after you remove your gloves.
- ⦿ Remove and dispose of your gloves in the correct manner.

Safe removal of protective gloves

After you have treated a patient, your gloves will have germs on them. You need to know how to remove and dispose of the gloves properly. This will help to avoid getting bacteria or any of the patient's blood on your skin. Follow the steps below to safely remove gloves:

HOW TO REMOVE GLOVES SAFELY



1. Pull the outside of the glove around the wrist area very gently.



2. Peel the glove away from your body, turning it inside-out.



3. Hold the inside-out glove in the other hand.



4. Peel the other glove away from your body, turn it inside out and leave the first glove inside the second.



5. Dispose of the gloves safely and wash your hands.

2.5 Bleeding

Blood vessels

Blood vessels form most of the circulatory system in the body. They are networks of tubes inside the body that carry blood. There are three types of blood vessels:

Arteries

They are the largest blood vessels. Arteries take blood away from the heart to organs and tissues. The artery wall is thick and muscular. This is so it can cope with the high pressure and large amount of blood being pumped from the heart.

Veins

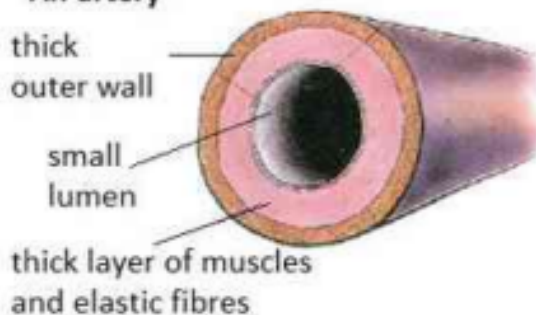
Veins return the blood to the heart. The walls of the veins are thin as the blood is at low pressure. To stop blood from flowing the wrong way, veins have valves.

Capillaries

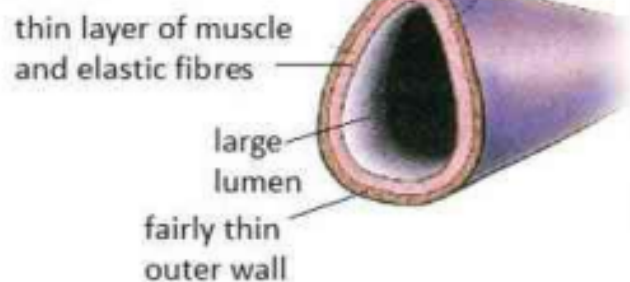
They are very small, thin-walled blood vessels. They form a network to take blood through the organs and tissues.

Section through the three types of blood vessels

An artery



A vein



A capillary



Bleeding from different blood vessels

When someone has a cut that is bleeding, it is important to know what type of bleeding it is; is it due to a tear in the artery, vein or capillary?

Which blood vessel is cut?	How severe is it?
Artery	This is a very severe injury. A cut artery will bleed very fast. Artery blood is normally bright red and spurts out (comes out fast) of the wound. It will not stop by itself, and the person could lose consciousness very quickly. This is because blood pressure becomes low. If untreated, the person could be dead within minutes.
Vein	If a person has a cut through a vein, it is less dangerous than an artery cut. The blood is usually dark red and oozes from the wound. In rare situations, it could result in death if not treated. Generally, you will have a few hours to get medical attention. The person may need to get stitches to close the wound.
Capillary	If a person has a cut through a capillary, the blood trickles out of the wound with low pressure. The cut will usually clot and stop bleeding by itself.

ARTERIES



VEINS



CAPILLARIES



Remember

If you need to treat a patient who is bleeding, always wear gloves. Protective gloves will keep you safe from infection. They will also protect the patient from contamination.

2.6 Soft tissue injuries

What are soft tissue injuries?



Keyword

tissue

a group of cells which have the same structure and function

Soft tissue injuries are injuries to any skin, muscle, tendon, or ligament in the body. These injuries are not bone fractures or injuries to internal organs, such as the brain, heart, stomach or intestines. There are different types of soft tissue injuries. Let's look at open soft tissue injuries.

What are open soft tissue injuries?

They are injuries where the skin is broken, which cause blood loss and open wounds that can become infected. Open soft tissue injuries can vary from minor injuries such as a papercut to more dangerous and life-threatening injuries such as amputations.



Keyword

amputation

to remove part of a person's body

Types of open soft tissue injuries

Let's look at five types of open soft tissue injuries.

1. Abrasion

An abrasion is an injury caused by scraping or grazing the skin on a rough surface, like concrete. This type of injury is common on knees, elbows, and hands. They normally happen from falling or tripping.



2. Avulsion

An avulsion is when the skin is torn from the body during an accident or other injury.



3. Laceration

A laceration is a deep cut. It may go through the skin to muscle tissue. Major blood vessels and nerves may also be damaged. Lacerations may be caused by injury with a sharp object. They may also be an impact injury from a sharp object, or force, such as a bullet from a gunshot. They may happen anywhere on the body.



4. Puncture

A puncture is caused by a sharp object such as a nail or a knife going through the skin.



2.6 Soft tissue injuries



Further information

First aid for puncture injuries

If someone has a puncture injury, and the object is still in the wound, you should keep it there until a medical professional arrives. This is because the object could have cut an artery. If you remove the object, the casualty will bleed a lot and could die in minutes.

Follow these steps for a puncture injury:

- ⦿ Call an ambulance, or get someone else to call if possible, and get a first aid kit and AED if available.
- ⦿ Wear PPE such as gloves.
- ⦿ Do not remove the object.
- ⦿ Try to stop any bleeding by applying bandages on both sides of the object.
- ⦿ Keep a note of when the puncture injury happened.

5. Amputation

An amputation is the complete removal of part of the body. This can happen due to an accident or intentionally through surgery. Surgical amputation normally happens when a part of a limb is very badly injured so it must be removed.





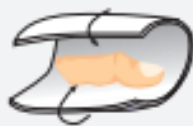
Further information

First aid for amputation

If treated properly, it can be possible to reattach amputated fingers or toes. It is very important to know what to do in this situation. Your actions will increase the chance of successful reattachment.

Follow these steps to give first aid for a finger amputation.

- ⦿ Call an ambulance, or get someone else to call if possible, and get a first aid kit and AED if available.
- ⦿ Wear PPE such as gloves.
- ⦿ Stop the bleeding from the injured area by applying pressure. Keep firm pressure on the wound for as long as needed to slow and stop the bleeding.
- ⦿ Find the amputated part.
- ⦿ Rinse the amputated part with clean water.
- ⦿ Wrap it in a clean dressing. (1)
- ⦿ Put it in a plastic bag that is tightly sealed and will not allow any water to get in. (2)
- ⦿ Put that bag in another bag, or bowl of ice and cold water. (3)
- ⦿ Label the bag with the time of amputation and the person's name.
- ⦿ Make sure it goes to the hospital with the injured person.



1.



2.



3.

Do not put the amputated body part directly in ice. This may cause more damage.

2.7 Wound dressings

Dressings and bandages



Discussion: Types of wound dressings

Can you name any of the types of wound dressings that exist? Are the same dressings used for small cuts as for larger ones?

The difference between a dressing and a bandage can often be confused.

	
Dressing	Bandage
This is the material used directly on the wound to stop bleeding. Any clean cloth or a piece of gauze can be used as a dressing.	This is the material used to protect or cover an injury. It can also be used to apply pressure to a wound by tying it tightly.

It is important to know the difference between a dressing and a bandage, and how to use each one when giving first aid.

You will learn how to apply a bandage in this lesson.

How to control bleeding

If the patient's cut is small and not bleeding heavily, wash it under water and apply a dressing such as a plaster.



Large cuts

Knowing how to correctly use a bandage is very important to help stop bleeding. The bandage will hold the gauze in place. This will free up your hands to do other tasks, such as:

- calling 998 if needed.
- treating other injuries on a casualty.
- treating other patients who need help.

A bandage can also prevent infection or further harm. This is because the bandage acts as a shield protecting the open wound from infection.

There are many different types of bandages for different types of injuries.

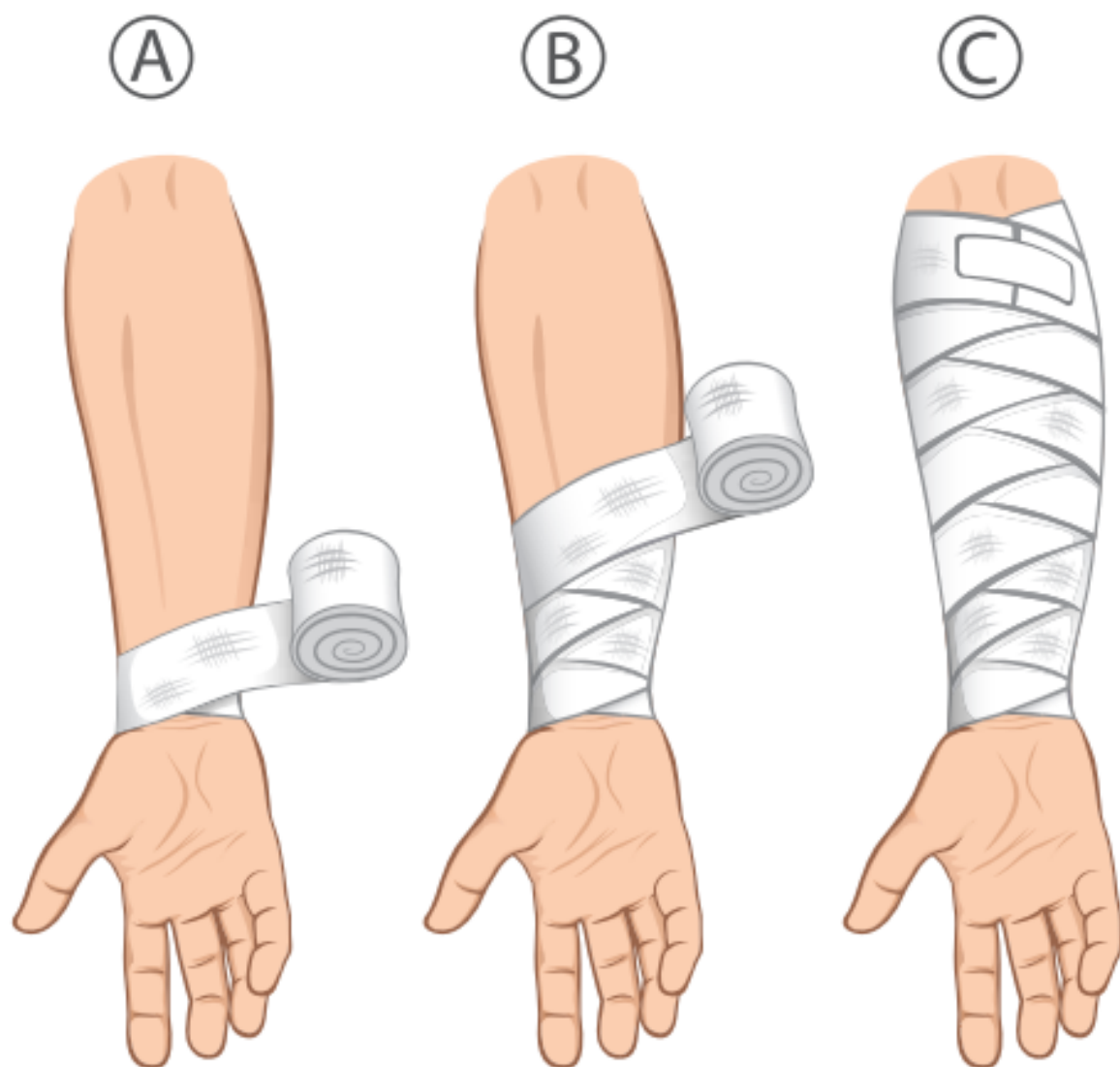


2.7 Wound dressings

Applying a bandage

1  Assess the scene for dangers.	2  Ask for permission to give first aid.
3  Get the first aid kit and use PPE such as gloves.	4  Apply direct pressure to the cut with a gauze dressing.
5  Start bandaging from below the gauze and work up the limb.	6  Wrap in a circular motion until the wound and gauze are fully covered with no gaps.
7  Tuck the bandage in at the end or tie it in a knot to secure it.	8  Be careful that it is not too tight. You do not want to cut off the circulation to the rest of the limb.

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Did you know?

You can check for lack of circulation by looking at the ends the fingers. Check that they are not turning blue or purple. If they are, your bandage is too tight, and you will need to fix it.

2.7 Wound dressings

How to use a tourniquet



Break it down:

tour-ni-quet

Sometimes a wound will bleed so much that applying pressure will not stop or slow the bleeding. In this case, a tourniquet is needed. This is a device that wraps around an arm or leg very tightly and stops large amounts of blood loss.

If the bleeding requires a tourniquet, make sure you or someone else calls an ambulance as soon as possible. Also, get a first aid kit and an AED, if there is one available. If you have a first aid kit, it should have a pre-made tourniquet which is made of two parts; a strap and an item that looks like a stick. This is called a windlass.

How to use a pre-made tourniquet

1



Wrap the strap around 5cm above the wound.

2



Tighten it using the windlass. This will cause pain to the injured person but should stop the bleeding.

3



Make a note of the time when you applied the tourniquet and leave it until help arrives.

If a pre-made tourniquet is not available, it is easy to make one by using a cloth and a stick, or another object.



Discussion: Useful items

Look around your classroom. If you needed to make a tourniquet right now, what items could you use? Discuss with the rest of the class.

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A home-made tourniquet

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 1	Fold a long cloth or bandage so that it is at least 2.5cm wide.
 2	Wrap the bandage around 5cm above the wound. In the centre of the bandage, place whatever you are using instead of a windlass. This could be a stick, pen, screwdriver, scissors, etc. In this case, they are using a stick.
 3	Tie the ends of the bandage around the stick. Then turn it to tighten the bandage/cloth.
 4	Create another knot at the top of the tourniquet to hold the stick in place.
 5	Make a note of the time when you applied the tourniquet and leave it in place until help arrives.



UNIT 3

Anatomy and physiology

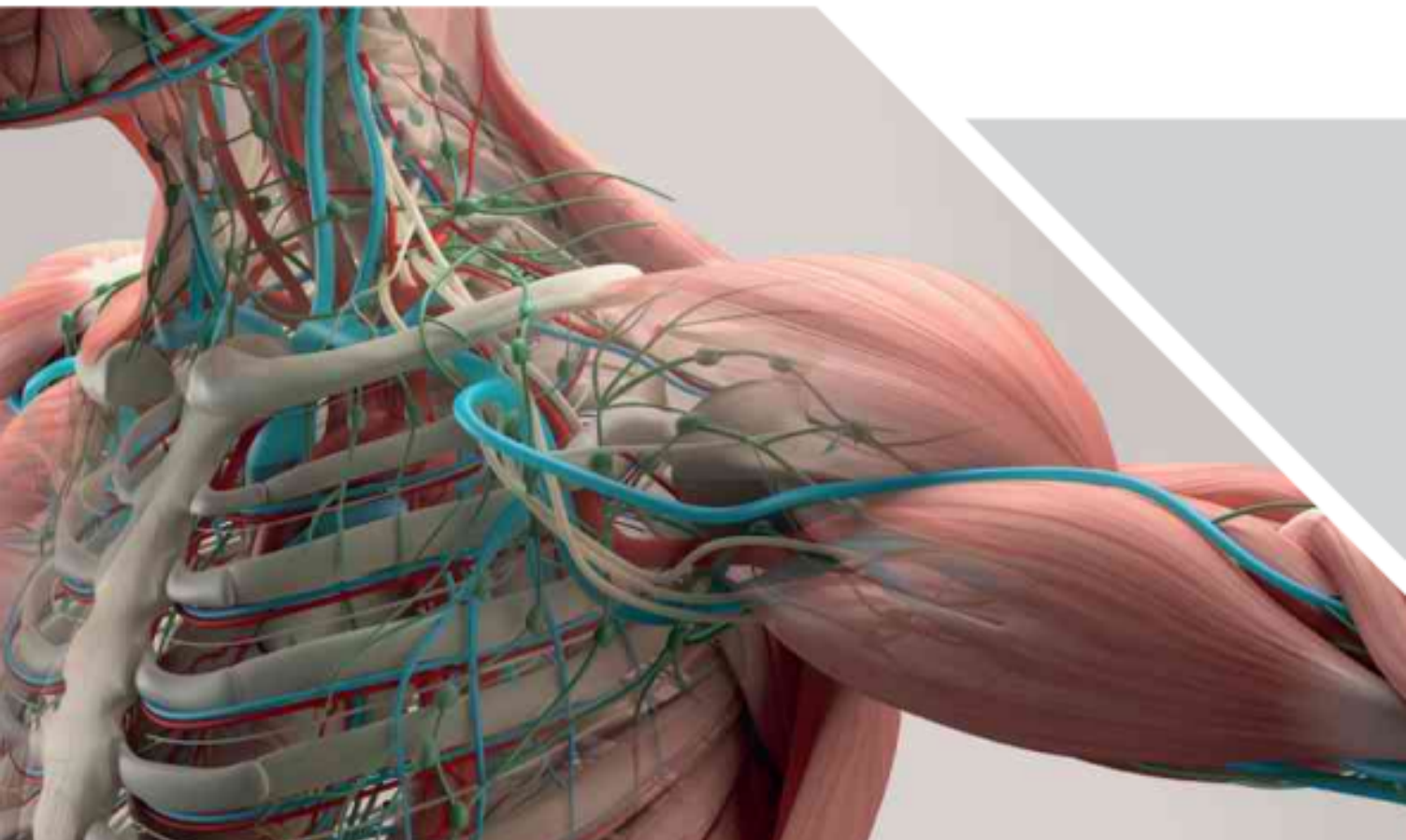
- 3.1** Homeostasis
- 3.2** Human tissue
- 3.3** The musculoskeletal system
- 3.4** The circulatory system
- 3.5** The respiratory system
- 3.6** The nervous system
- 3.7** The digestive system
- 3.8** The immune system

Introduction

To understand the human body, it is important to know the structure of its parts, what they do, and how they work together. Anatomy is the scientific study of the structure of living things. Physiology is the study of how the structures function.

If you understand the structures of the human body and their functions, it can help you to recognise when the body is not working properly. This is an important part of the job of a healthcare professional, but it can also be useful in looking after your own health and the health of your family.

In this unit, you will learn to identify the different systems of the human body, what parts of the body make up the systems and what their role is.



Learning outcomes

Standard HSC.5.1.01: Describe the major systems of the human body, including the skeletal, muscular, nervous, respiratory, digestive, immune and circulatory systems.

Learning outcomes:

HSC.5.1.01.001 Explain the concept of homeostasis.

HSC.5.1.01.002 Describe the different types of tissues and their functions.

HSC.5.1.01.003 Describe the structure and function of the musculoskeletal system.

HSC.5.1.01.004 Describe the structure and function of the circulatory system.

HSC.5.1.01.005 Describe the structure and function of the respiratory system.

HSC.5.1.01.006 Describe the structure and function of the nervous system.

HSC.5.1.01.007 Describe the structure and function of the digestive system.

HSC.5.1.01.008 Describe the components and function of the immune system.

Keywords

Word	Form	Definition
absorb	verb	to take in something, such as a liquid in a natural or gradual way
anatomy	noun	the study of the structure of living things
antibody	noun	a substance produced by the body to fight disease
carbon dioxide	noun	a waste gas that is produced when people breathe out
cardiac	noun	relating to the heart
circulation	noun	the movement of blood through the vessels of the body
contract	verb	to make something smaller
deoxygenate	verb	the oxygen has been removed

Word	Form	Definition
exhale	verb	the action of breathing out
external	adjective	existing or happening outside the body
dense	adjective	closely compacted, thick
digestion	noun	the process by which food is changed to a simpler form after it is eaten
homeostasis	noun	the ability of the body to maintain a stable internal environment
immune	noun	protected from a disease
inhale	verb	the action of breathing in
internal	adjective	existing or happening inside the body
neurone	noun	a nerve cell that carries an electrical impulse
organ	noun	a part of the body (such as the heart or liver) that has a particular function
oxygenated	adjective	combined with oxygen
pathogen	noun	something infectious, such as a virus, bacteria, fungi or parasite that causes a disease
peristalsis	noun	a series of involuntary, wave-like muscle contractions that move food along the GI tract
physiology	noun	the study of the ways that living things or their parts function
regulate	verb	to control or maintain a process so that it works properly
respiration	noun	the action of breathing
skeletal	noun	relating to the skeleton
surface	noun	the outer part or top layer of something
system	noun	a group of organs that work together to perform an important function of the body
tissue	noun	groups of cells that make up parts of the body and perform a specific function

3.1 Homeostasis

Anatomy and physiology



Discussion: Anatomy and physiology

Have you heard the words anatomy or physiology before? What do you think they mean?

To understand the human body, you need to know its different parts, what they do and how they work together. **Anatomy** is the scientific study of the structure of living things. **Physiology** is the study of how these structures function.

The human body is made up of different systems. Each system contains different parts that are responsible for different functions.



Keyword

function

the way in which something works in the body

The major body systems are:



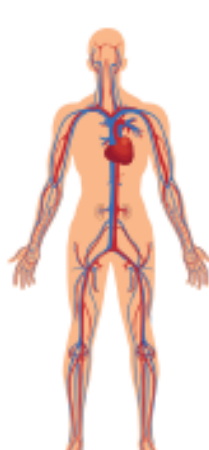
The musculoskeletal system



The respiratory system



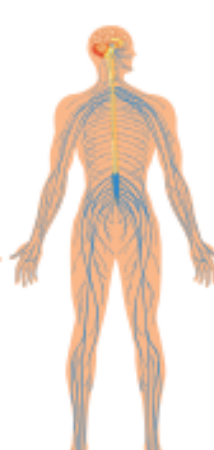
The immune system



The circulatory system



The digestive system



The nervous system

Homeostasis

Homeostasis is happening all the time within our bodies. It includes any process that controls our body's internal environment no matter what happens in the external environment. This needs to be done so that the body can work at its best level.

Our external environment is constantly changing. When you exercise or go outdoors your body may be exposed to a higher temperature. When you find yourself in a situation that makes you stressed, this can cause your blood pressure to rise.

Homeostasis happens in these instances to make sure your body continues to work at its best level.



Further information

The three components of homeostasis

There are three components involved in regulation of the body. These components are:

- ⦿ The receptor
- ⦿ The control centre
- ⦿ The effector

The **receptor** senses a change in the environment and sends a signal to the control centre (in the brain). The **control centre** decides how to respond to the change in environment. It sends a signal to the **effector** in the body and changes are made.

3.1 Homeostasis

Thermoregulation

Thermoregulation is the process of regulating temperature within the body. If you go outside on a hot day, your body carries out homeostasis in order to regulate its internal temperature. This prevents your body from overheating and making you feel unwell.

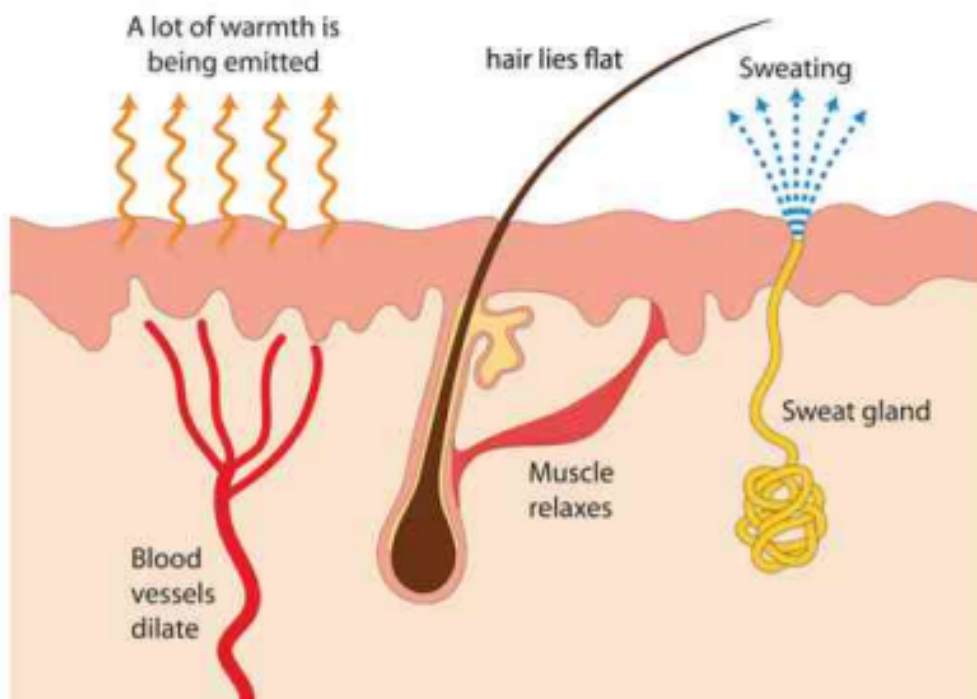
When your body temperature increases, receptors on your skin and other internal parts of the body send signals to part of the brain called the hypothalamus.



Break it down:

Hy-po-tha-la-mus

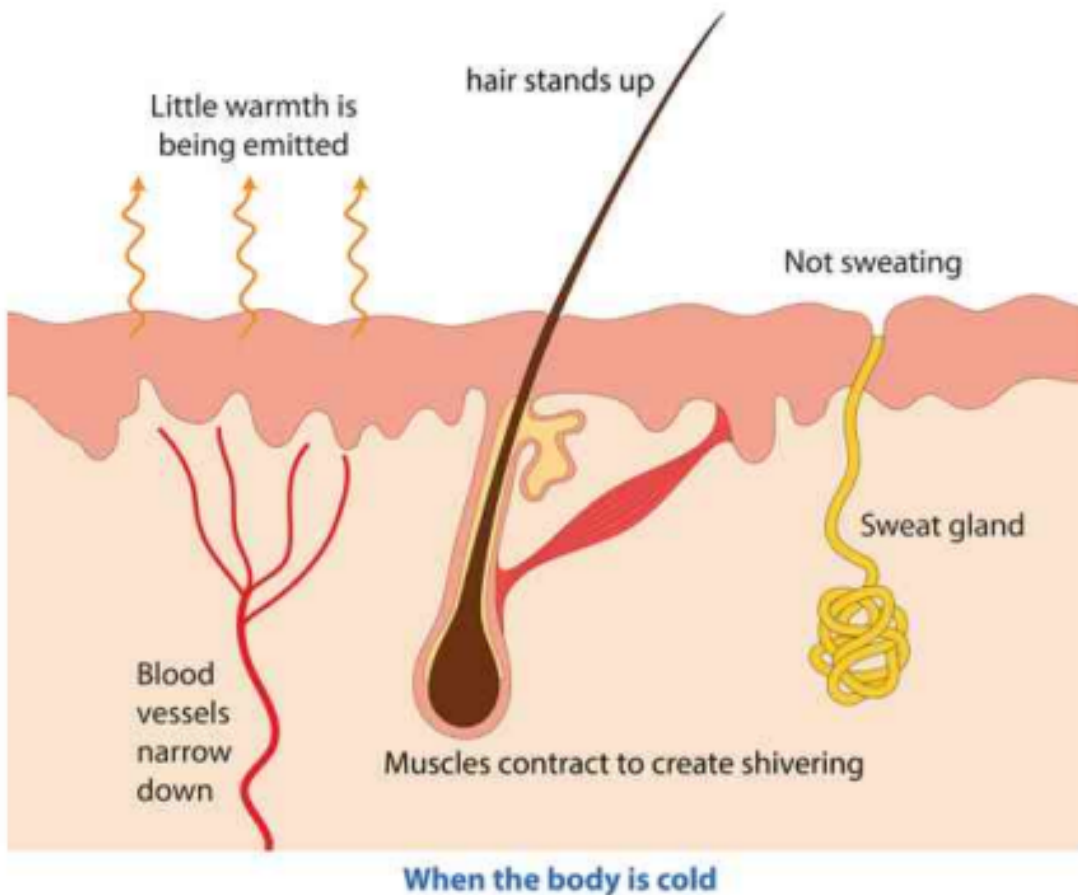
The hypothalamus recognises the temperature increase and it sends signals to glands in the body to produce sweat. This sweat causes heat loss. The hypothalamus also signals for the hairs on the body to lay flat and release pockets of warm air. The muscle walls of blood vessels will relax, causing an increase of blood flow to the capillaries in the skin. This allows more heat to escape.



When the body is hot

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When the body temperature decreases below normal, the opposite happens. The hypothalamus signals for sweat glands to stop producing sweat. Muscles under the skin contract causing shivering and the hairs to stand on end. Blood vessels become narrow so that less blood flows to capillaries near the skin and less heat is lost.



What else does homeostasis regulate?

Thermoregulation is just one example of how something in our bodies (in this case, temperature) is regulated by homeostasis. Homeostasis can also regulate the following:

- ⊙ Blood glucose
- ⊙ Carbon dioxide
- ⊙ Water content
- ⊙ Calcium levels

3.2 Human tissue

What is human tissue?

Tissue is a group of cells that work together to do a job in the body. Parts of the body are made from tissue, such as organs and muscles. Body organs include the brain, heart, lungs and kidneys.

There are four types of tissue in the human body. They are grouped together because they have the same structure and function.

The four tissue types are:

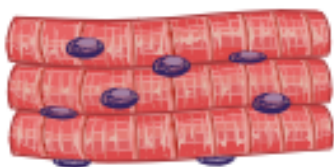
1. Muscle tissue
2. Epithelial tissue
3. Nervous tissue
4. Connective tissue

1. Muscle tissue

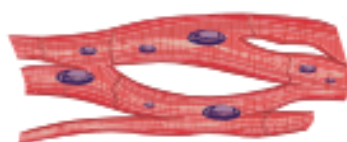
Muscles are flexible, soft tissues that make the body strong and allow it to move. Long, tube-shaped cells called fibres contract (shorten) and then relax. This is what creates movement.

There are three types of muscle tissue:

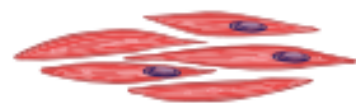
- ⊙ **Skeletal muscles** – attached to the bones and create movement
- ⊙ **Cardiac muscle** – the walls of the heart
- ⊙ **Smooth muscles** – found inside the organs, and help the organs to function



Skeletal muscle



Cardiac muscle



Smooth muscle

2. Epithelial tissue

Epithelial tissue contains cells that line the outer surfaces of the organs and blood vessels. They also cover the inside parts of internal organs. Skin is an example of epithelial tissue.

Epithelial tissue forms a protective barrier between the body and the external (outside) environment.

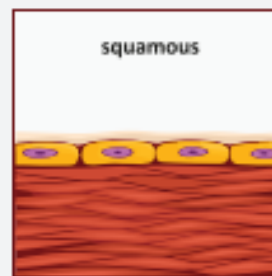
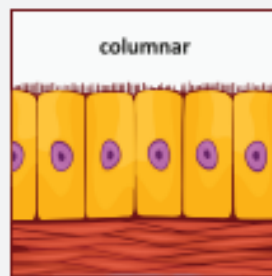
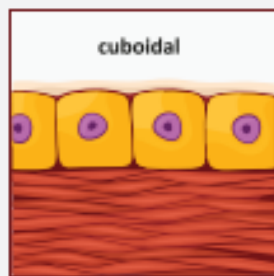


Further information

There are three main shapes of epithelial cells. They are:

- ⊙ Cuboidal
- ⊙ Columnar
- ⊙ Squamous

You can see the shapes of each type of cell below.



3. Nervous tissue

Nervous tissue is found in the nervous system. Nervous tissue is made of cells called neurones. Neurones send and receive messages from the nerves.

The nervous system is responsible for controlling the body's movement, mental activity and homeostasis.



3.2 Human tissue

4. Connective tissue



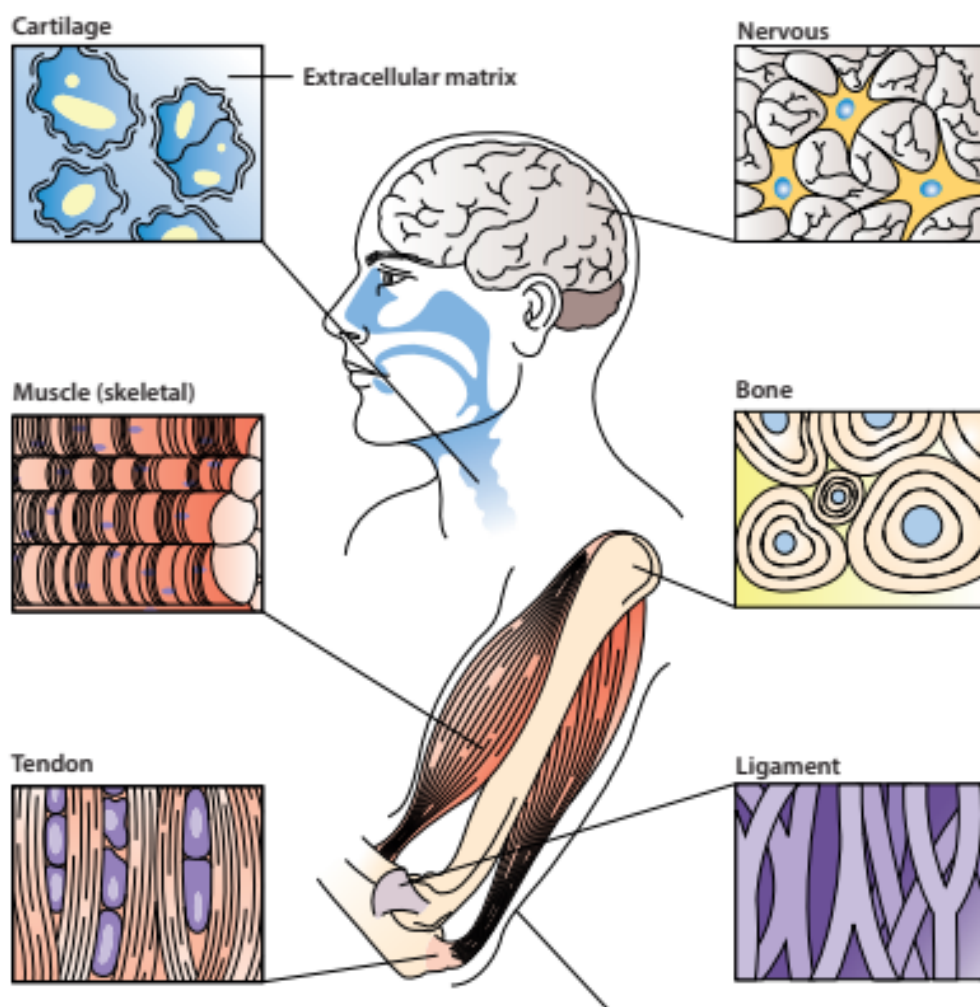
Keyword

connective tissue

a strong material that connects the parts of the body

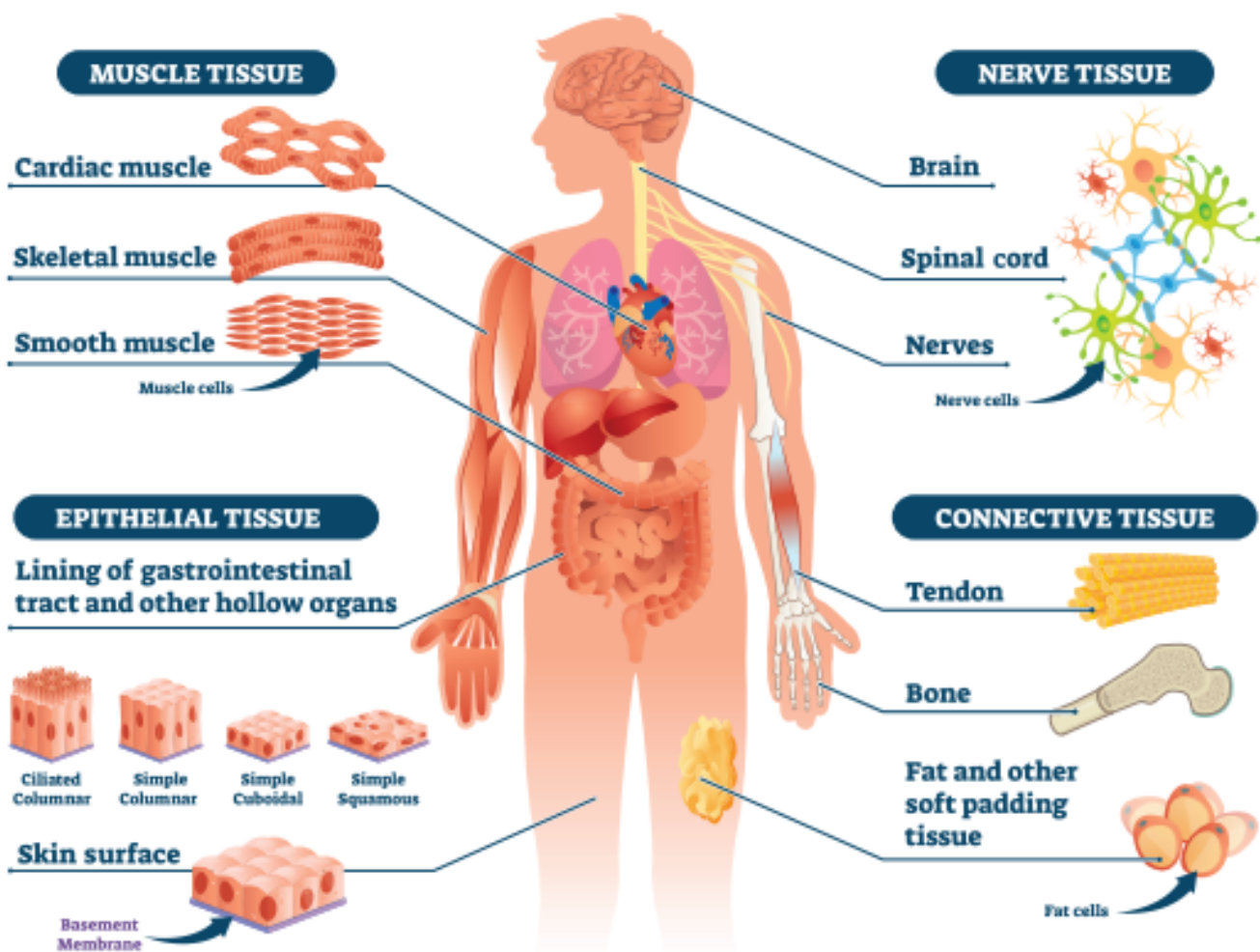
Connective tissue is found between other tissues everywhere in the body. It connects the different organs and parts of the body together. It also supports and protects the body.

You can find connective tissue in different physical structures including muscle, tendons, ligaments, cartilage and bone.



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TYPES OF TISSUES



3.3 The musculoskeletal system

What is the musculoskeletal system?

The musculoskeletal system is a combination of two body systems: the muscular system and the skeletal system.

- ⊙ **The muscular system:** contains the skeletal, cardiac and smooth muscles
- ⊙ **The skeletal system:** contains the bones, joints, tendons, ligaments and cartilage

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Together, the muscular system and the skeletal system provide the body with shape, stability and movement.

They are grouped together as the musculoskeletal system because they depend on one another to function. Without a musculoskeletal system, the body would not be able to stand, walk or sit.



Research

Research the reasons why the muscular system and the skeletal system are grouped together as the musculoskeletal system.

The muscular system

Muscles are a very important part of the body as they allow us to do many different things. You have over 600 muscles in your body, which make up about half of your body weight. Muscle tissue is found attached to bones, inside the heart, digestive organs and blood vessels.



Remember

The three types of muscle tissue are:

- ⦿ Skeletal muscle – muscle attached to bone.
- ⦿ Cardiac muscle – muscle found in the heart.
- ⦿ Smooth muscle – muscle found inside organs and blood vessels.



The functions of the muscular system

Movement of the body

The main function of the muscular system is movement. Muscles are the only tissue that can contract and so they can move other parts of the body.



Example

The skeletal muscles in your legs are attached to the bones in your legs. When the muscles contract, your bones move and this allows you to walk.

3.3 The musculoskeletal system

Movement of substances inside the body

Cardiac and smooth muscles are responsible for transporting substances like blood or food from one part of the body to another.

Posture and body position

Skeletal muscles can contract to hold the body still or in a particular position, rather than causing movement. The muscles that are responsible for posture should be strong as they hold up parts of the body throughout the day without becoming tired.



Body temperature control



Think back to the lesson on homeostasis, where you learned about thermoregulation. When body heat decreases, the skeletal muscles increase their activity to increase the temperature by shivering, smooth muscles inside blood cells contract to try to retain heat.

When the body becomes too hot, the smooth muscles in blood vessels relax so that blood flow can increase and heat is lost through the skin.

The skeletal system

The skeleton provides support, protection and movement of the body. Bones also store minerals, such as calcium, and produce blood cells. The skeletal system is made of bones, joints, cartilage, tendons and ligaments. These are all types of connective tissue.



Keyword

calcium

a mineral found in most animals that is needed for strong bones

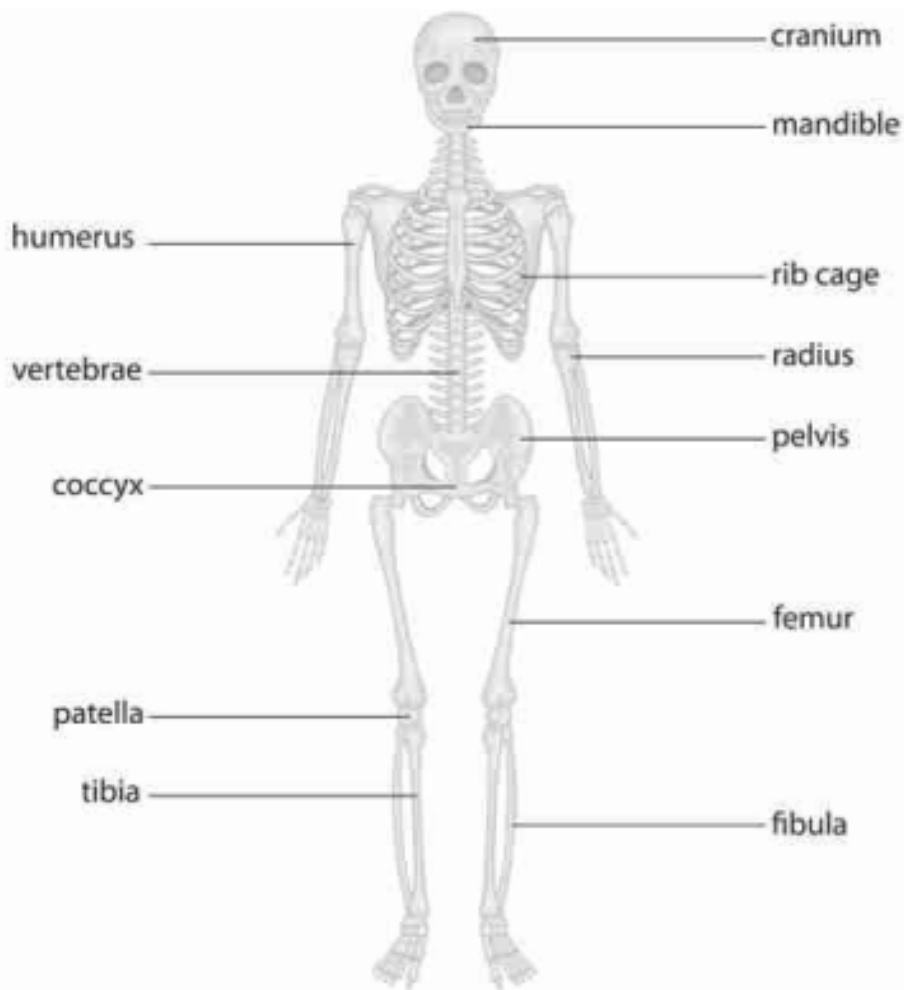
The skeleton

Below you can see an image of a skeleton with a selection of bones labelled on it.



Did you know?

Babies are born with around 300 bones in their skeleton. By the time they reach the age of 25, their skeleton has only 206 bones. This is because some of our bones join together as we get older.



Research: More bones

Research some other bones in the body that are not labelled in the image above.

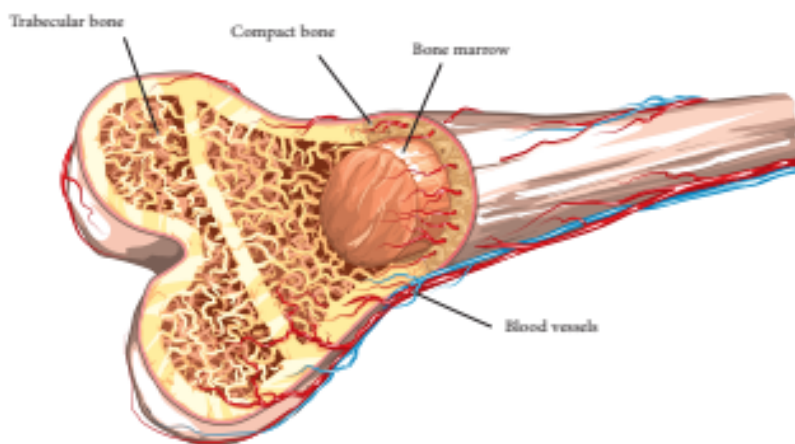
3.3 The musculoskeletal system

Bones

Bones are a hard, dense type of connective tissue. Around 70% of bones are made from hard minerals such as calcium.

The structure of a bone:

- ⊙ The outside of a bone is hard, smooth, and solid.
- ⊙ On the inside, is a porous spongy bone material called the trabecular bone. It is lightweight, which makes it easier for us to move around.
- ⊙ At the centre of a bone is a soft part called the marrow.



Further information

There are two types of bone marrow: yellow marrow and red marrow. Yellow bone marrow is mostly fat cells. Red marrow is where the body produces red and white blood cells.

Joints, tendons, ligaments and cartilage

Bones are connected by joints. A joint is where two bones meet, such as the knee or elbow.

Tendons and ligaments connect muscles to bones. They are involved in pulling the bones when the muscles contract.

Cartilage is another type of connective tissue that is soft, yet strong. Cartilage is found surrounding bones at the joints and it prevents the bone ends from rubbing against each other.



The functions of the skeletal system

Support

The skeletal system is the frame that provides support for the body. Without the skeletal system, the body would just be loose skin, organs and muscle.

Protection

Inside the body are soft organs, such as the brain, heart and lungs. If these are damaged, it can cause severe medical problems. The bones of the skeleton protect these organs.



Example

The skull protects the brain; the bones of the ribcage protect the heart and lungs; the spine protects the spinal cord.

Movement

The bones of the skeleton support the muscles and help to create body movement. Muscles are attached to the bones. When the muscles contract, the bones act as levers which moves the body parts. Muscles can be attached to two, or many bones. This allows all the different movements that the body makes.



3.4 The circulatory system

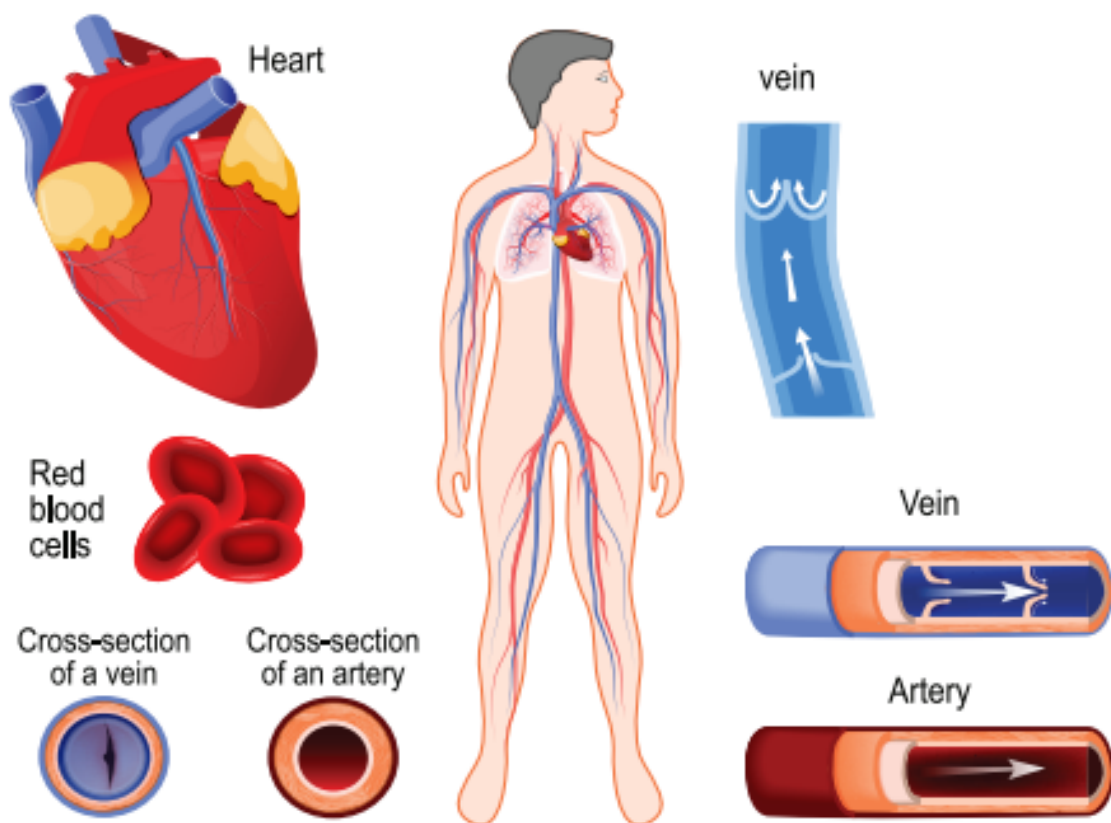
The anatomy of the circulatory system



Discussion: The circulatory system

What do you already know about the circulatory system? Do you know the parts of the body within this system?

The circulatory system contains the heart, blood vessels (arteries, veins and capillaries) and blood.



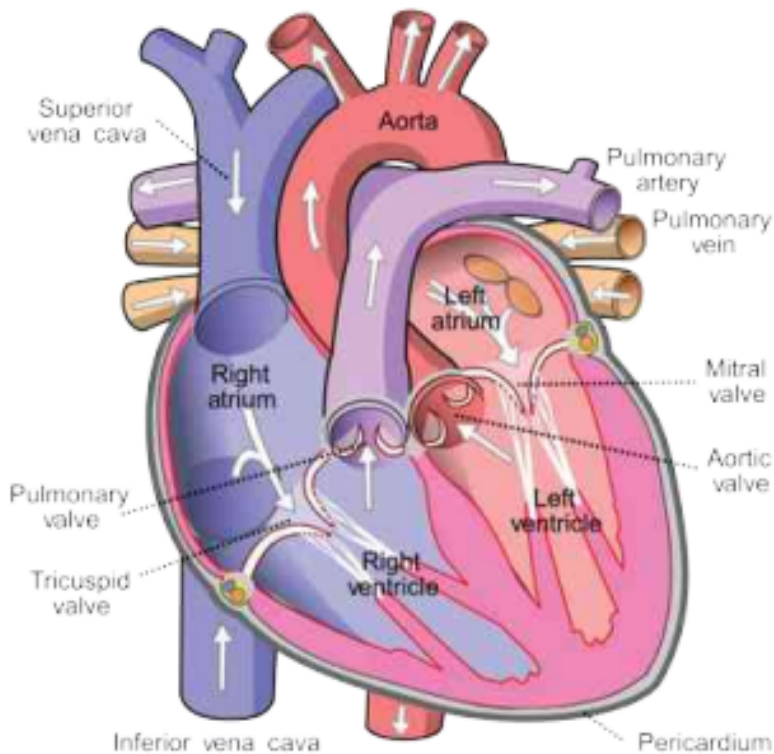
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The heart



Video: The heart

Watch the video showing the structure and function of the heart.



The heart is made up of four chambers; at the top there are the left atrium and right atrium. At the bottom there are the left ventricle and right ventricle.

There are four valves, these separate the left atrium from the left ventricle, and the right atrium from the right ventricle. The purpose of valves is to open and close every time the heart beats. This will prevent the backflow of blood, in other words, valves make sure blood flows in only one direction.

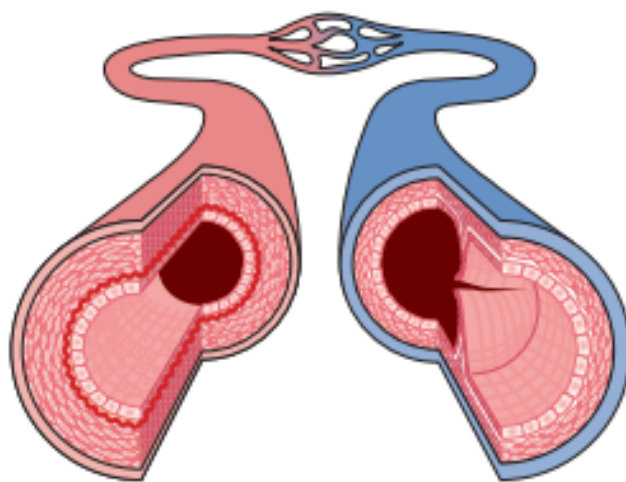
There are four blood vessels connected to the heart, two connected to the left side and two connected to the right side. The aorta and pulmonary vein are connected to the left side, while the superior vena cava and the pulmonary artery are connected to the right side of the heart.

3.4 The circulatory system

Blood vessels

Once the blood leaves the heart, the blood vessels carry it around the body. As you know, these are arteries, veins and capillaries.

1. Arteries: carry oxygen-rich blood from the heart to the rest of the body.
2. Veins: carry oxygen-poor blood from the body to the heart.
3. Capillaries: transfer oxygen and nutrients from the blood to organs and tissue.



Think

The reason why veins are usually blue in colour is because they are carrying oxygen-poor blood, while arteries are red because they carry oxygen-rich blood.



Remember

Arteries are the largest type of blood vessel. They have thick, muscular walls. Veins are smaller than arteries. Veins contain valves which prevent the backflow of blood.

Capillaries are very small thin-walled blood vessels. They form a network to take oxygen and nutrients from blood to organs and tissues.

The physiology of the circulatory system

Circulation of blood happens when the heart contracts (beats). This contraction is created by the "sinus node". The sinus node generates an electric impulse, which makes the heart contract. This contraction allows blood to circulate around the body. The heart functions as follows:

The lungs send **oxygenated blood** to the heart.

The heart pumps the **deoxygenated blood** to the lungs.



The heart pumps the **oxygenated blood** to the body.

The body sends **deoxygenated blood** to the heart.

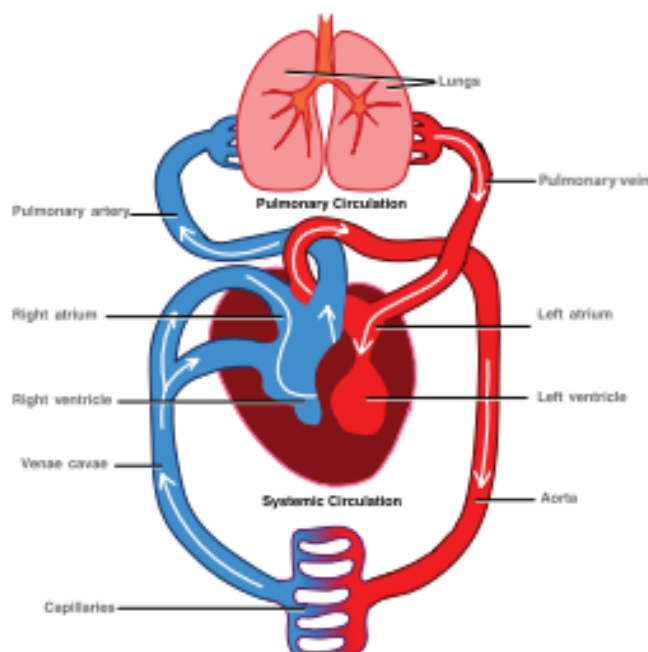
Lungs provide the blood with **oxygen** and blood provides the lungs with carbon dioxide.

Deoxygenated blood in the right side of the heart is pumped to the lungs by the pulmonary artery to collect oxygen.

Oxygenated blood from the lungs is sent to the left side of the heart through the pulmonary vein.

Deoxygenated blood from the body is sent to the right side of the heart through the vena cava.

Oxygenated blood in the left side of the heart is pumped to the body by the aorta and this blood is transported to the body by arteries and capillaries.



3.5 The respiratory system

The anatomy of the respiratory system



Keyword

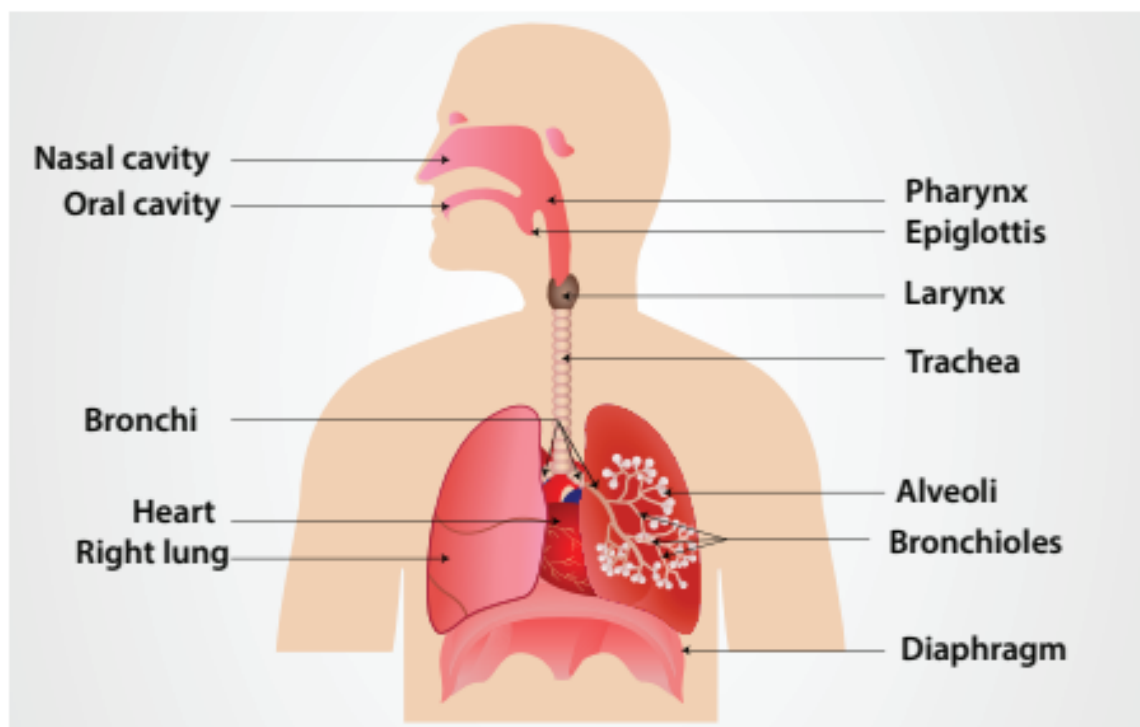
respiration

the action of breathing

The respiratory system is what allows people to breathe. Breathing is when air is pulled into the body (inhaled) then pushed out again (exhaled).

The respiratory system's main function is to supply oxygen to every part of the body. It does this by inhaling oxygen-rich air and exhaling air filled with carbon dioxide, a waste gas.

The respiratory system contains the **airway**, the **lungs** and the **muscles of respiration**.



Did you know?

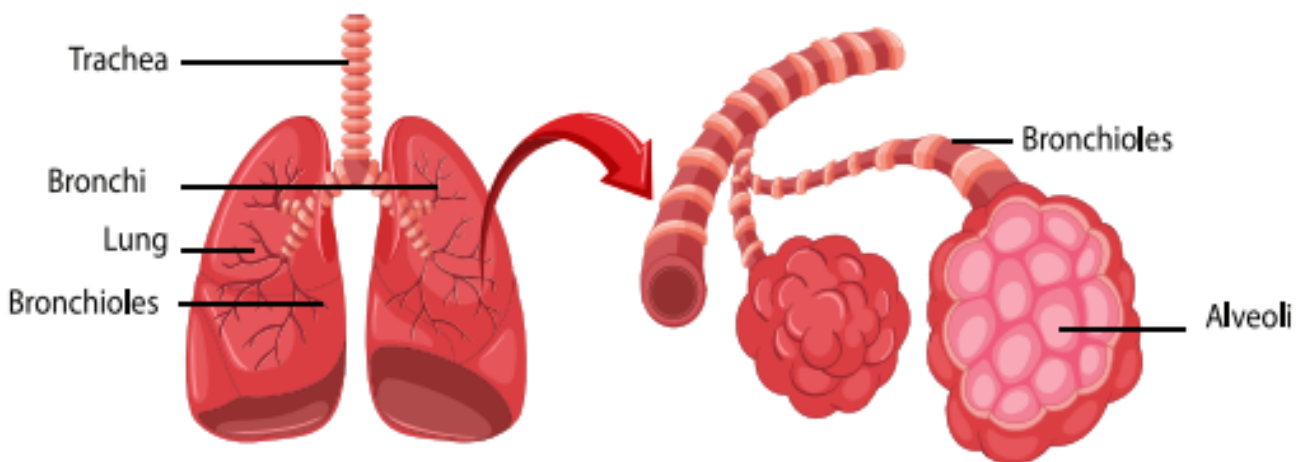
The respiratory system is also called the respiratory tract.

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The airway

The airway carries air from outside the body into the lungs. The main parts of the airway:

- ⊙ The **nasal cavity** (nose) and the **oral cavity** (mouth) – This is where air enters the body.
- ⊙ The **pharynx** (throat) – This is a passage for air going to the lungs from the nose and mouth.
- ⊙ The **larynx** – Air passes through the larynx during exhalation. This is what allows people to talk.
- ⊙ The **trachea** (the windpipe) – The trachea contains large rings, which allow the airway to stay open at all times, allowing air to enter and leave the lungs.
- ⊙ The **bronchi, bronchioles and alveoli** – At the end of the trachea, the bronchi split into two airways that go into each lung. They then split into smaller 'bronchioles' which pass air into the alveoli.



The lungs

The lungs are two spongy, air-filled organs at the centre of the respiratory system. They contain the bronchioles and the alveoli.

The lungs expand (get bigger) during inhalation as they fill with air. When the air goes out during exhalation, they compress (decrease in size).

3.5 The respiratory system

Muscles of respiration

Sets of muscles surround the lungs allow air to be inhaled or exhaled from the lungs. The main muscle that does this is the diaphragm. This muscle makes the lungs expand and compress. Small muscles between the ribs, called intercostal muscles, also increases the lung volume when they contract.

The physiology of the respiratory system

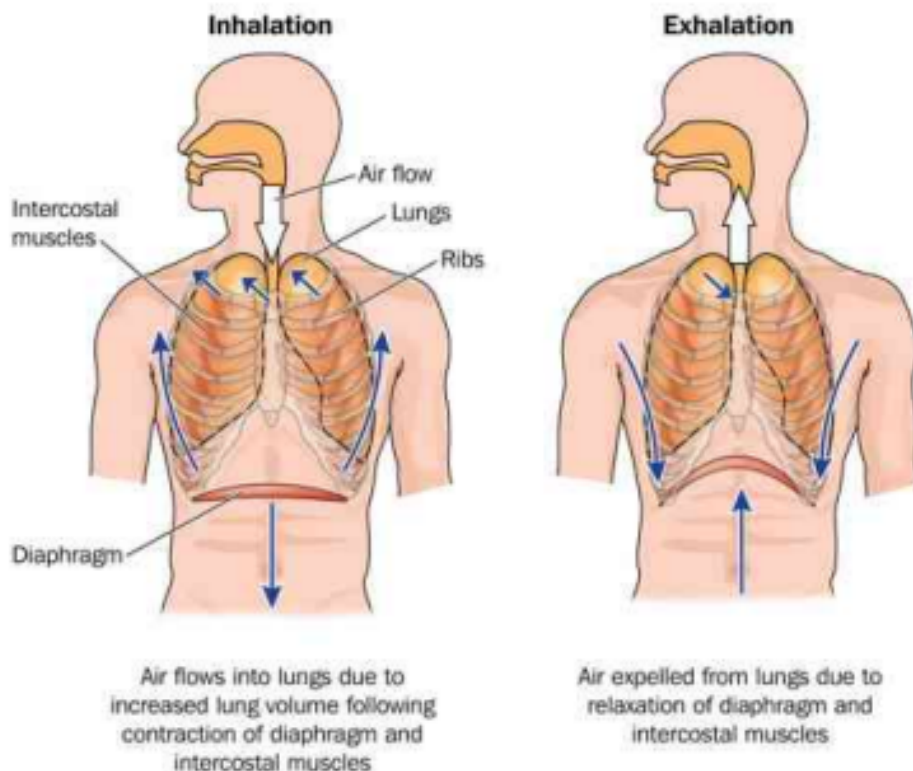


Remember

Inhalation means breathing in; exhalation means breathing out.

Inhalation and exhalation

When someone **inhales**, the diaphragm moves down and the intercostal muscles get smaller. This moves the ribs move up and out. The space increases in the chest cavity which lowers the air pressure in the lungs. This pulls air into the lungs through the nose and mouth.



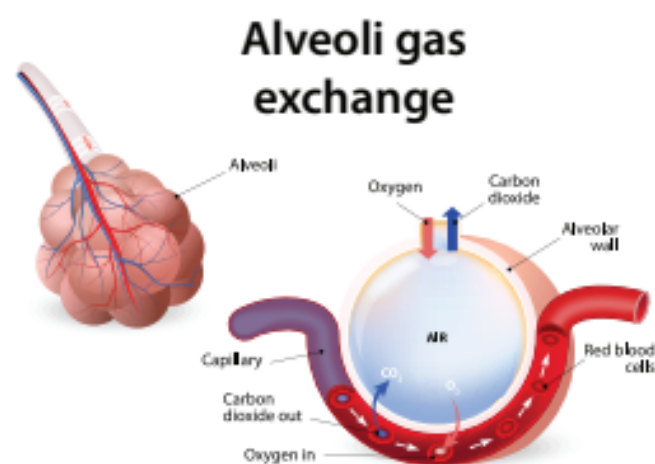
When a person **exhales**, the diaphragm moves upward and the intercostal muscles in the chest wall relax. This causes the chest cavity to contract. As a result, air pressure in the lungs increases. Air then flows out of the lungs, leaving the respiratory system through the nose or mouth.

Gas exchange

As a person breathes, they take in oxygen and breathe out carbon dioxide. This is called gas exchange.

This process happens in the alveoli in the lungs. These tiny air sacs collect the oxygen from the inhaled air. They then pass the oxygen to the capillaries, which transfer it to the red blood cells.

The alveoli also collect the waste products and carbon dioxide from deoxygenated blood. This is exhaled when we breathe out.



Further information

The circulatory system and the respiratory system work closely together. This ensures that all the organs, tissues and cells of the body receive enough oxygen.

The air inhaled and held in the lungs is transferred to the blood. The heart pumps this oxygenated blood from the lungs to the body.

These two body systems also work together to remove carbon dioxide; carbon dioxide is known as a metabolic waste product.

3.6 The nervous system

The anatomy and physiology of the nervous system



Discussion: The nervous system

What do you know about the nervous system? Do you know what the nervous system does?

The nervous system controls the body's actions; it responds to sensory information by sending signals to and from different parts of the body.



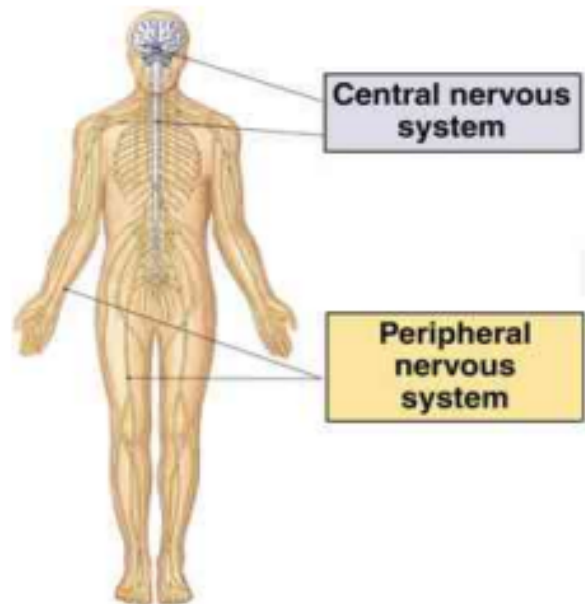
Keyword

sensory

relating to the physical senses of sight, smell, hearing, taste and touch

The nervous system contains the peripheral nervous system (PNS) and the central nervous system (CNS).

- ⊙ **The peripheral nervous system (PNS)** includes the peripheral nerves. These are found in the arms and legs. The PNS is responsible for taking messages from the sensory receptors and passing on these messages to the CNS.
- ⊙ **The central nervous system (CNS)** contains the brain and the spinal cord. The CNS is responsible for understanding the messages sent by the PNS. The CNS then sends messages back to the body telling it how to react.



Example

If you touch something hot, the peripheral nerves (located in the skin) send a message of pain to the CNS. The CNS then sends a message back to the PNS to tell the muscles in your hand to pull away.



Remember

There are four types of tissue found in the body. The tissue in the nervous system is called nervous tissue.

The brain

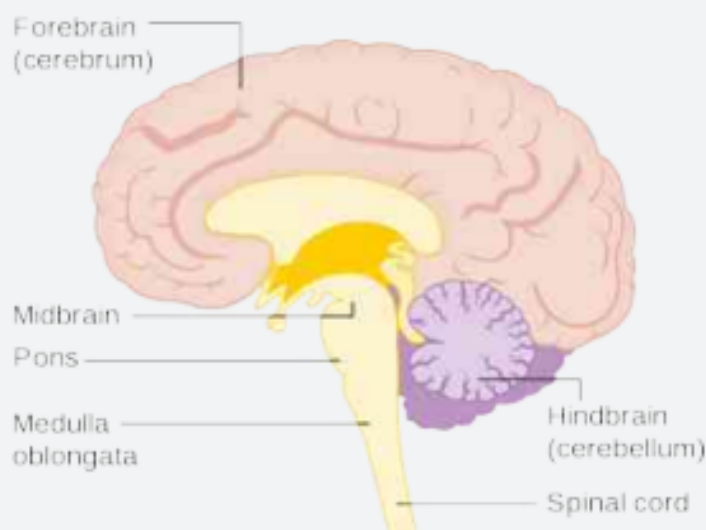
The brain is one part of the CNS. It controls all the body's functions. It uses the rest of the nervous system to communicate with the body.



Further information

The main parts of the brain are:

- ⊙ **The forebrain** – The forebrain is the largest part of the brain. It contains the cerebrum and the cortex. The cerebrum collects information from the senses. The inner part of the forebrain contains the thalamus and the hypothalamus; the hypothalamus controls homeostasis.
- ⊙ **The midbrain** – This area of the brain manages all the messages going in and out of the brain through the spinal cord.
- ⊙ **The hindbrain** – This part of the brain contains the cerebellum which is responsible for balance and coordination.
- ⊙ **The brainstem** – The midbrain and parts of the hindbrain (the pons and the medulla oblongata) are called the brainstem. The brainstem takes in and sends out messages to and from the spinal cord.



3.6 The nervous system

The spinal cord

The spinal cord is the other part of the CNS. It is a long, thin tube containing nervous tissue. It runs from the brainstem to the bottom of the back. The spinal cord transmits messages from the PNS to and from the brain.



Further information

The spinal cord is protected by the spine. The spine is split into four areas of vertebrae (bones) and nerves:

- ⊙ cervical
- ⊙ thoracic
- ⊙ lumbar
- ⊙ sacral

The spinal cord also controls the body's reflexes. A reflex is a quick action that the body does without telling the brain, such as pulling your hand away from something hot.

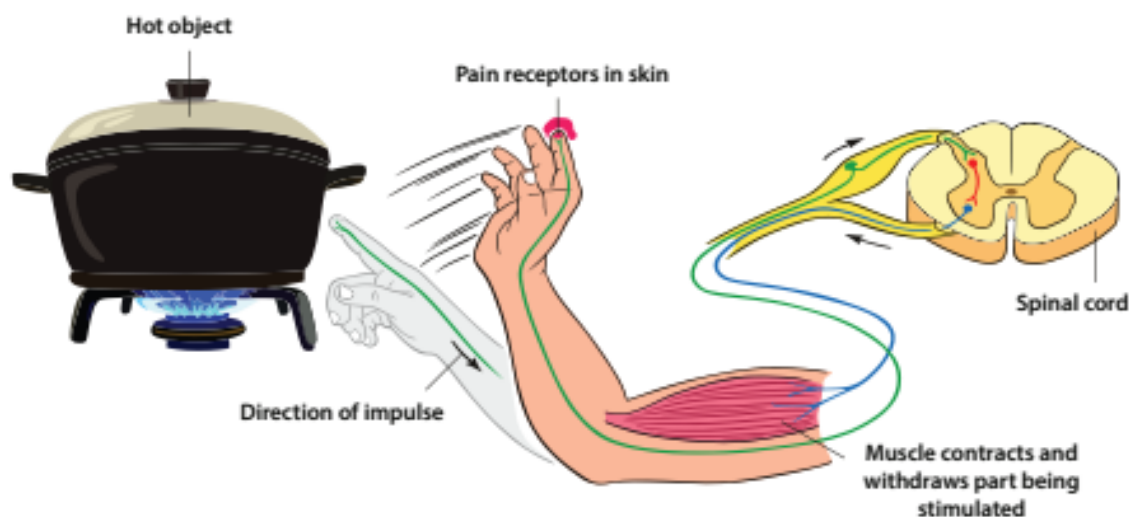


Keyword

reflex

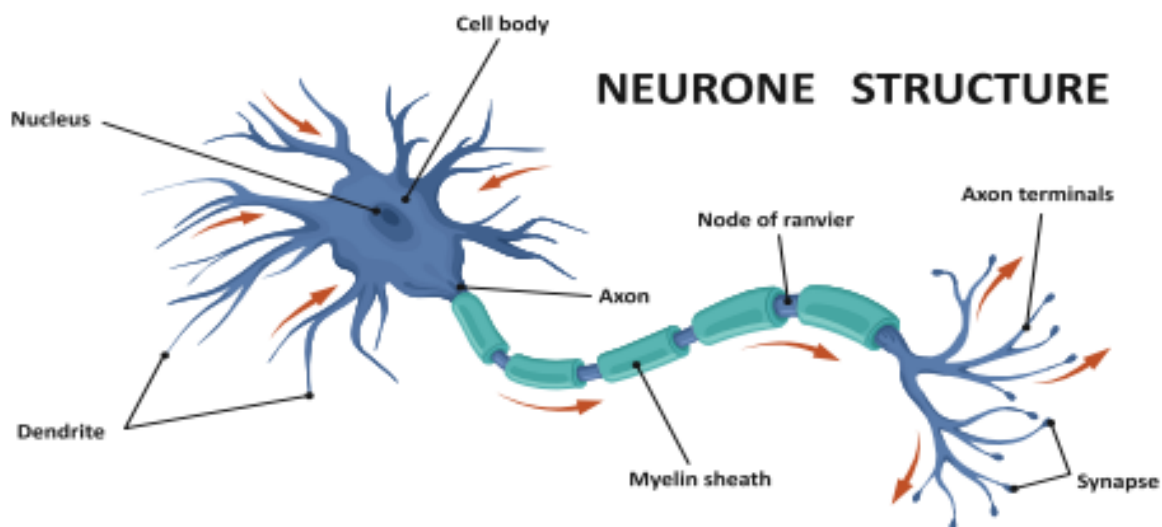
an action or movement of the body that is a reaction to something and happens without thinking

Reflex



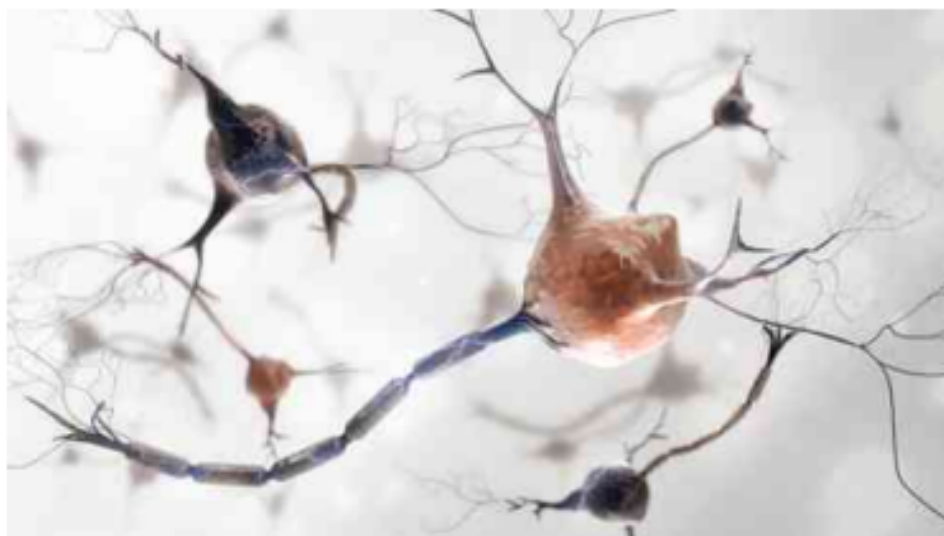
Neurones

Neurones carry communication signals from the spinal cord around the rest of the body; these signals are carried by the PNS. Neurones are nerve cells that carry electrical signals.



There are two main types of neurones: sensory neurones and motor neurones.

- ⦿ **Sensory neurones** – Take in sensory information about what you hear, see, taste, touch and smell. They send signals to the CNS.
- ⦿ **Motor neurones** – Take information from the CNS to muscles and glands so they can react in the correct way.



3.7 The digestive system

The anatomy of the digestive system

The digestive system breaks down food and drink into smaller pieces. It does this until they can be absorbed into the body and turned into energy.



Keyword

digestion

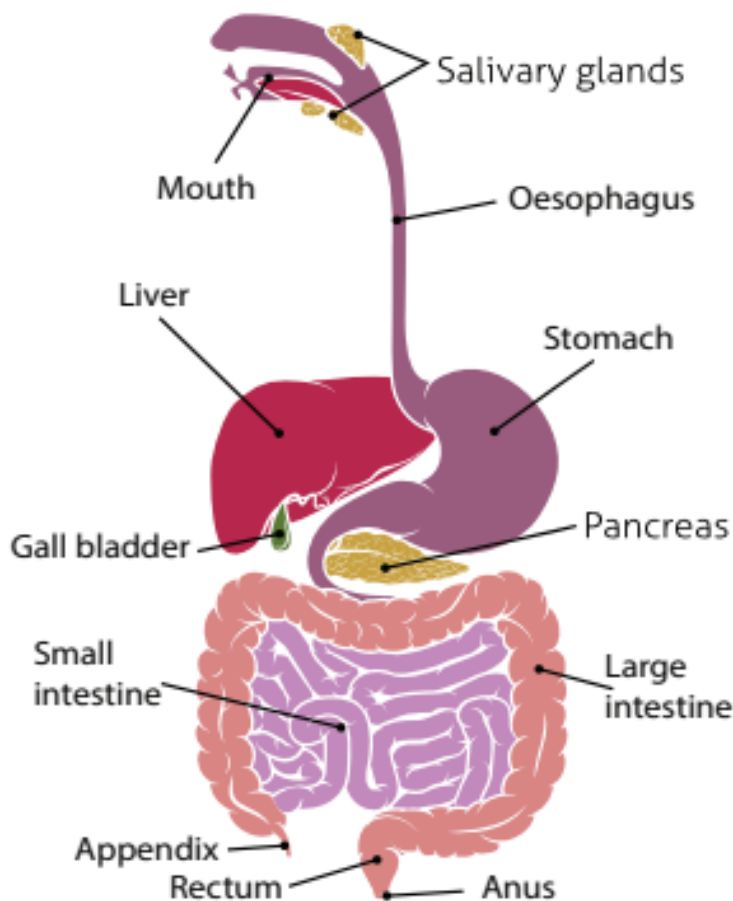
the process in which food is changed into a more simple form after it is eaten

There are many parts that make up the digestive system including:

- ⊙ the gastrointestinal (GI) tract
 - mouth
 - oesophagus
 - stomach
 - small intestine
 - large intestine
 - rectum
 - anus
- ⊙ the liver
- ⊙ the pancreas
- ⊙ the gallbladder

Other things are also required for digestion. This includes bacteria which is found in the gastrointestinal tract.

Different body systems also help digestion, such as parts of the nervous and circulatory systems, and the muscles.



The physiology of the digestive system

Digestion starts when food enters the **mouth**. When food is chewed, the mouth releases saliva. The saliva starts to break down the food and makes it easier to swallow.

When food is swallowed, it travels down the **oesophagus** into the stomach.



Keyword

enzyme

a chemical substance in humans and animals that causes a natural process like digestion

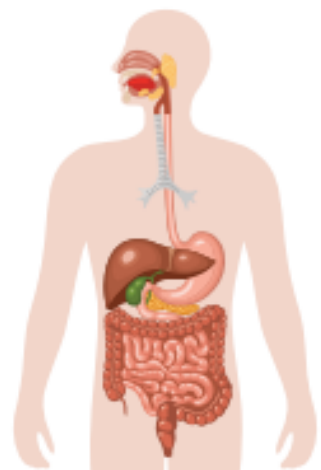
In the **stomach**, food is mixed with enzymes and acids which break it down into very small pieces. When the contents of the stomach have been broken down, they are released into the small intestine.

The **small intestine** breaks down the mixture even more so the body can absorb all the nutrients contained in the food. Once the nutrients needed by the body have been absorbed, a waste product, called stool, moves into the large intestine.

In the **large intestine**, the majority of water contained in the stool is removed.

The stool then passes into the **rectum**, towards the **anus**. This is where the stool is passed out of the body.

The whole digestive process takes between 24 and 72 hours.



Did you know?

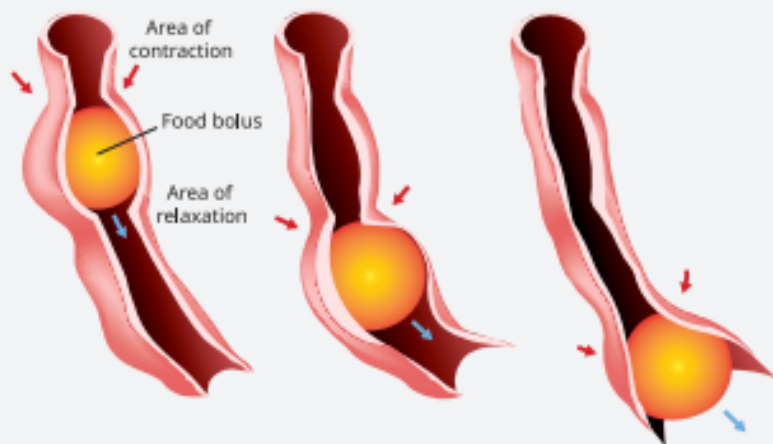
Together an adult's small and large intestines measure around 7.5 metres long. The small intestine is about 6 metres long; the large intestine is about 1.5 metres long.

3.7 The digestive system



Further information

Food is able to pass through the organs of the GI tract because of a process called peristalsis. During this process, smooth muscles in each of the organs contract and relax in a wave-like motion. This moves the food along. These muscle contractions are involuntary, meaning you cannot physically control this process.



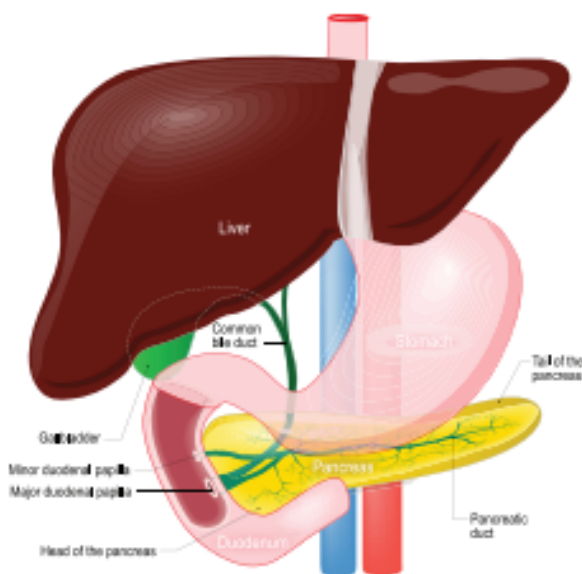
Physiology of the liver, gallbladder and pancreas

Although food does not travel through the liver, gallbladder and pancreas, these organs are still an important part of the digestive system.

The pancreas - The pancreas produces enzymes that help to digest proteins, fats, and carbohydrates.

The liver - Nutrient-rich blood goes to the liver for processing. The liver filters out harmful substances and waste. It sends nutrients to the rest of the body or stores them in the liver for when they are needed. The liver also produces a substance called bile which helps the body absorb fat.

The gallbladder - stores bile from the liver until it is needed. The enzymes and bile travel directly into the small intestine. This is where they help to digest food.



WHERE DOES MY FOOD GO AFTER I EAT IT?



Hello, apple!
You look yummy...
let's go!

On a journey through
my digestive system...

my **salivary glands**
make saliva, which
have enzymes that
start to chemically
break down the food

my **teeth** and
jaw chew the food
into small pieces

my **liver**
makes bile, which
helps neutralise
stomach acid and
digest some vitamins

bile is stored in
my **gall bladder**
until it's needed

in my **duodenum**,
bile and enzymes
from my pancreas
continue to break
down the food

my **colon**
absorbs water
and electrolytes

my **tongue**
mixes saliva
with the food

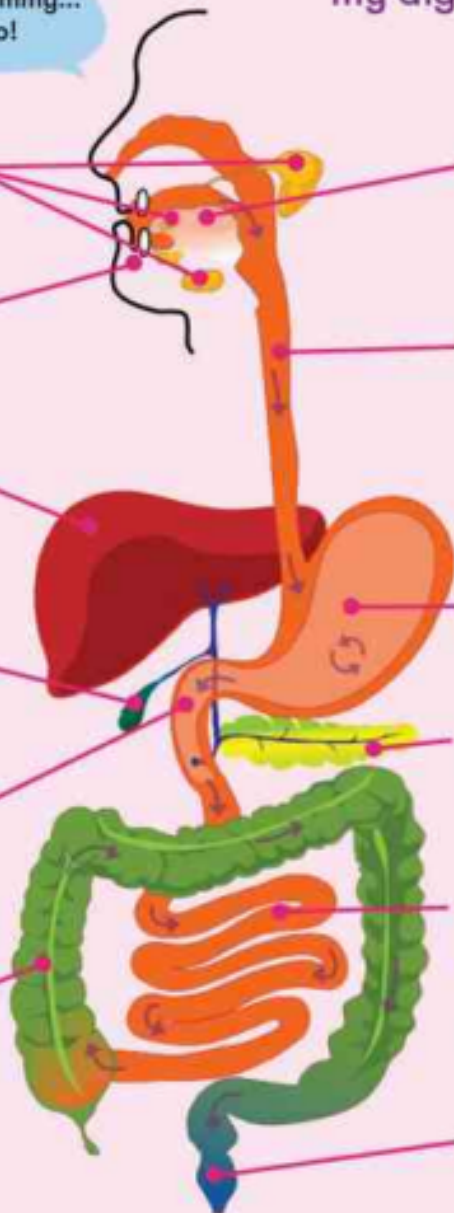
muscle contractions
push the food down
my **oesophagus**

my **stomach**
churns the food,
mixes it with strong
acid, and turns it
into a thick soup

my **pancreas**
makes enzymes
that break down
the food

muscle contractions
push the food through
my **small intestine**,
which digests and
absorbs the nutrients
from the food

my **rectum** passes
the leftover waste out
into the toilet



3.8 The immune system

The anatomy of the immune system

The function of the body's immune system is to 'fight' any diseases that enter the body. It does this by producing antibodies which fight infections and help the body to stay healthy.



Keyword

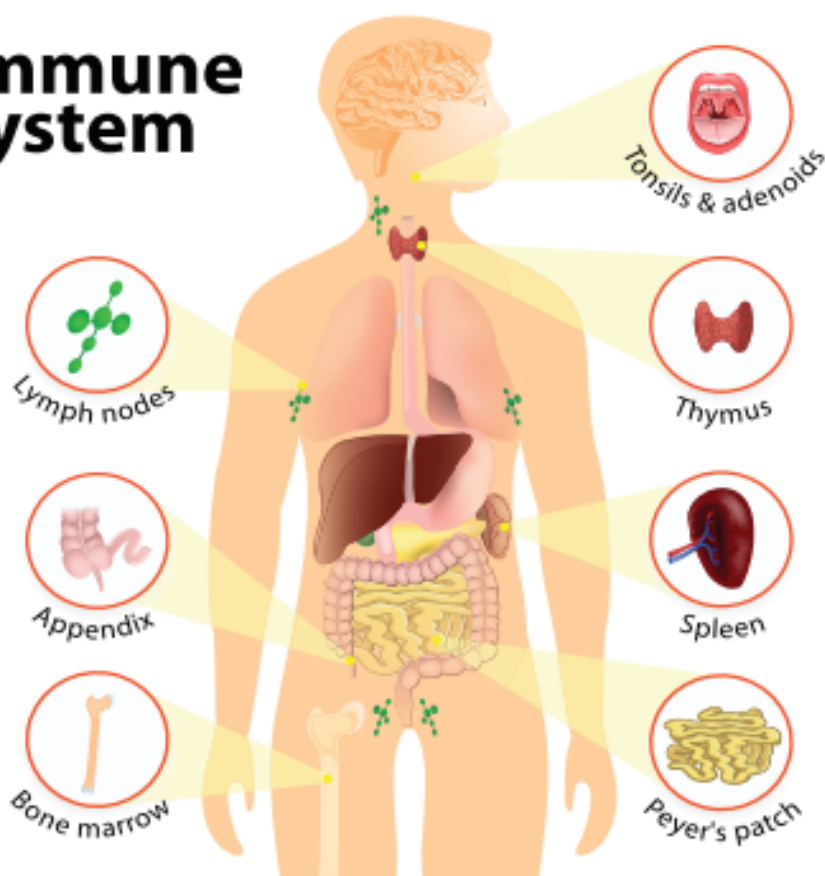
immune

protected from a disease

The immune system contains these parts of the body:

- ⊙ white blood cells
- ⊙ the tonsils and adenoids
- ⊙ the lymph nodes
- ⊙ the thymus
- ⊙ the appendix
- ⊙ the spleen
- ⊙ bone marrow
- ⊙ Peyer's patches (in the intestine)

Immune system



Components of the immune system

White blood cells

White blood cells are the cells that help protect the body against infectious diseases, bacteria and foreign bodies. A foreign body is something that is inside the body but should not be there.



Example

If you cut yourself, the white blood cells travel to the area of the cut to destroy any bacteria that may have entered the body.

Let's look at two common types of white blood cells:

Phagocytes - Around 70 per cent of white blood cells are phagocytes. These cells destroy any disease-causing organisms that enter the body. They do this by surrounding and ingesting the bacterial cells. Phagocytes do not produce antibodies, instead they surround and enclose the bacterial cell. They then secrete enzymes to destroy the bacterial cell.

White blood cell
(phagocyte)



Lymphocytes - Around 25 per cent of white blood cells are lymphocytes. These white blood cells are created in the bone marrow. There are two types of lymphocytes:

White blood cell
(lymphocyte)



- ⊙ B-lymphocytes (B-cells) – make antibodies to fight a foreign body in a variety of ways.
- ⊙ T-lymphocytes (T-cells) – kill the body's own cells that have already been taken over by a foreign body.



Keyword

antibody

something produced by the body to fight disease

3.8 The immune system

Lymph nodes

Lymph nodes are small, bean-shaped glands that produce and store cells; these cells fight infection and disease.

The lymph nodes are part of the **lymphatic system**. They are found in the neck, armpits and groin. This system also contains the bone marrow, spleen and thymus.

Spleen

The spleen contains white blood cells. It helps to control the amount of blood in the body and destroys old or damaged blood cells.

Bone marrow

Bone marrow is the soft tissue in the centre of a bone where white blood cells are made.

Thymus

This is where the T-cells develop.

The physiology of the immune system

When the body senses the presence of foreign substances, the white blood cells work to find these foreign substances and destroy them.



The immune system does this by telling the B-cells to make antibodies. The antibodies surround and attach to the surface of the foreign substances.

They destroy foreign bodies by:

- ⊙ causing them to burst open and die.
- ⊙ labelling them so they are recognised more easily by phagocytes.
- ⊙ sticking them together in clumps so that they can be engulfed by phagocytes more easily.

Immunity

Immunity means that the body can protect itself from disease.

There are three types of immunity:

Passive immunity – Passive immunity is 'borrowed' from another source and lasts for a short time. For example, the antibodies in a mother's breastmilk give a baby temporary immunity to any diseases the mother has been exposed to.

Innate immunity – Everyone is born with innate (natural) immunity. Innate immunity is a general type of protection. For example, the skin blocks germs from entering the body.

Adaptive immunity – Adaptive (or active) immunity develops throughout your lifetime. People develop adaptive immunity when they are exposed to diseases.



Example

If you get a disease like chickenpox, you probably will not get it again. This is because the body has already made antibodies to protect you against this infection.



Further information

Some vaccines work in the same way as adaptive immunity to prevent some diseases.

The traditional style of vaccination introduces a small amount of a particular disease antigen to the body; however, it does not introduce enough to cause illness. This tells the body's immune system to make antibodies. These antibodies will protect the body from this disease in the future.





UNIT 4

Healthcare and ethics

- 4.1 Healthcare professionals
- 4.2 Health services
- 4.3 Outpatient and inpatient care
- 4.4 Patient rights and responsibilities
- 4.5 Ethics in healthcare
- 4.6 Patient confidentiality
- 4.7 Patient safety

Introduction

Healthcare is often something that we take for granted. However, the quality of healthcare you receive is something that can have a significant effect on your overall health.

You will explore the roles of different healthcare professionals. You will identify what ethics refers to within healthcare and explore the legal regulations that apply to healthcare delivery. It is important to be aware of a patient's rights and responsibilities within healthcare, whether you are the healthcare professional or the patient.

Everyone should know what their rights are within healthcare to ensure that they are being treated fairly and receiving the best treatment possible. This will allow you to be an empowered patient and make the best choices for yourself and your family.



Learning outcomes

Standard: HSC 3.2.01: Explore the role of healthcare professionals and identify rights and responsibilities within healthcare.

Learning outcomes:

HSC.3.2.01.001	List the types of healthcare professionals and their roles.
HSC.3.2.01.002	Identify different health services available in the community.
HSC.3.2.01.003	Compare and contrast inpatient and outpatient care.
HSC.3.2.01.004	Explain patient's rights and responsibilities in healthcare.
HSC.3.2.01.005	Define ethics in relation to healthcare.
HSC.3.2.01.006	Identify the legal and ethical regulations that apply to healthcare.
HSC.3.2.01.007	Explain the moral basis of patient confidentiality.
HSC.3.2.01.008	Identify the major principles of patient safety and harm prevention.

Keywords

Word	Form	Definition
autonomy	noun	independence; freedom of choice
beneficence	noun	to be of benefit
confidentiality	noun	keeping information private
diagnosis	noun	identification of an illness or other problem by examining the symptoms
ethics	noun	moral principles that control a person's behaviour, the way they act and how they live their day-to-day life
harm prevention	noun	practical strategies and ideas aimed at stopping or reducing negative consequences
healthcare provider	noun	a person or practice who helps in identifying, preventing or treating an illness or disability
justice	noun	fair behaviour or treatment
medical history	noun	record of past illnesses and treatments
medication	noun	a drug or other form of medicine that is used to treat or prevent disease
non-maleficence	noun	to do no harm
morals	adjective	the principles of what you believe to be right and wrong
primary care	noun	the initial healthcare provider you would see
regulate	verb	to control or maintain something
responsibility	noun	something you are required to do
right	noun	a moral or legal entitlement to have or do something
secondary care	noun	medical care that is provided by a specialist
tertiary care	noun	specialised care (usually in a hospital) you would be referred to from primary or secondary care

4.1 Healthcare professionals

What are healthcare professionals?

Healthcare professionals are educated and trained in different areas of healthcare. There are many different areas of health, and they can be involved in any of these areas, including:

- ⦿ the prevention of illness and disease.
- ⦿ the promotion of health.
- ⦿ health education.
- ⦿ the detection of illness and disease.
- ⦿ the treatment of illness and disease.



Types of healthcare professionals

There are many different healthcare professionals and they all have different responsibilities. However, the goal of all healthcare professionals is the same, this is to improve the patient's health.

Let's look at some example of healthcare professionals on the following pages.



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Doctor: A doctor can examine and diagnose a patient who is sick. They can recommend treatment to the patient. Doctors can specialise in many different areas of health.

Nurse: A nurse would usually work very closely to a doctor. Nurses can give treatment to patients who are sick. Then they follow up how patients are feeling after having the treatment. Nurses can specialise in many different areas of health and they have different responsibilities depending on their specialisation.

Dietitian: A dietitian will identify the nutritional needs patients. They make meal plans for people who have a medical condition. They promote healthy eating and educate people on the diet that is suitable for them.

Health promoter: A health promoter is responsible for educating people about their health before they become sick. There are many ways of doing this, which you will learn about whilst studying Health Sciences.

Pharmacist: A pharmacist prepares and dispenses prescriptions of medicines. They understand drug dosage, usage, and interactions in the body.

Paramedic: Paramedics are the people who arrive first on the scene of an emergency and provide the first care to the patient.



4.1 Healthcare professionals

Physiotherapist: A physiotherapist works closely with a patient who has an illness or disability. They aim to encourage movement, reduce pain, and reduce the chances of long-term disability.

Psychologist: A psychologist will assess, diagnose, and treat mental illnesses such as depression, developmental delay and learning difficulties.



Emergency medical technician (EMT): An EMT is an emergency responder trained to provide emergency medical care to the critically ill and injured.

There are many organisations in the UAE that provide training for people who want to have a career in healthcare. The National Ambulance and Dubai Corporation for Ambulance Services are just two of them.

The poster on the following page shows the National Ambulance programme to become an EMT.



NATIONAL AMBULANCE

EMIRATI EMERGENCY MEDICAL TECHNICIAN PROGRAMME

IN PARTNERSHIP WITH THE UNIVERSITY OF SHARJAH



AN EDUCATIONAL INITIATIVE TO PREPARE UAE NATIONALS TO BECOME EMERGENCY MEDICAL TECHNICIANS (EMTs)



ENTRY REQUIREMENTS

- THE CANDIDATE MUST:
- BE UAE NATIONAL
 - BE BETWEEN THE AGE OF 18 AND 35
 - HAVE A MINIMUM OF HIGH SCHOOL DIPLOMA OR EQUIVALENT
 - HAVE COMPLETED UAE NATIONAL SERVICE (FOR MALE APPLICANTS)
 - SUBMIT A CERTIFICATE OF GOOD CONDUCT
 - HAVE A VALID UAE DRIVING LICENCE
 - HAVE BASIC ENGLISH LANGUAGE SKILLS
 - BE MEDICALLY FIT
 - PASS THE SELECTION INTERVIEW

TRAINING PHASES

PHASE 1

FOUNDATION

- CORE CLINICAL TERMINOLOGY
- INTRO TO ANATOMY
- INTRO TO PHYSIOLOGY



PHASE 2

CORE

- CLINICAL INSTRUCTION BASED ON INTERNATIONAL CURRICULUM +
- BASIC LIFE SUPPORT (BLS)
- BASIC AIRWAY COURSE
- BASIC MEDICATION COURSE
- PEDIATRIC EMERGENCY ASSESSMENT
- RESUSCITATION & STABILISATION (PEARS) COURSE
- MAJOR INCIDENT MEDICAL MANAGEMENT SYSTEMS (MIMS) COURSE
- PRE-HOSPITAL TRAUMA LIFE SUPPORT (PHTLS)



PHASE 3

OPERATIONS (Practical Training)

- AMBULANCE PRACTICAL TRAINING
- HOSPITAL EMERGENCY ROOM EXPOSURE
- EMERGENCY COMMUNICATION TRAINING
- ADVANCE CARDIAC LIFE SUPPORT (ACLS) COURSE
- ADVANCE PEDIATRIC LIFE SUPPORT (PALS) COURSE



PROFESSIONAL DIPLOMA EMERGENCY MEDICAL TECHNICIAN (EMT-I)

THE PROGRAMMES AIMS TO ATTRACT MORE THAN:

50
STUDENTS



COURSE BY NUMBERS

ONE-YEAR PROGRAMME



1000+ HOURS OF INSTRUCTIONAL TIME



300+ HOURS OF EMERGENCY PRACTICAL EXPOSURE (ER + AMBULANCE PLACEMENT + AMBULANCE COMMUNICATIONS CENTRE)



5+ INTERNATIONALLY ACCREDITED LICENSED COURSES



GRADUATION

AS AN EMERGENCY MEDICAL TECHNICIAN-INTERMEDIATE (EMT-I)

- PROFESSIONAL DIPLOMA I PRE-HOSPITAL CARE
- EMPLOYMENT WITH NATIONAL AMBULANCE AS AN EMT-I

#BeAnEMT
#MakeADifference

FOR REGISTRATION OR MORE INFORMATION:
www.nationalambulance.ae/emt

الإسعاف الوطني National Ambulance



جامعة الشارقة
UNIVERSITY OF SHARJAH

4.1 Healthcare professionals

Healthcare careers



Keyword

career

a profession that a person has for most of his or her life.

Working in healthcare can be one of the most rewarding things you can ever do.

Healthcare professionals save people's lives and help sick people get better.

It is also an excellent way of serving the local community and making your country very proud of you.

Becoming a healthcare professional involves working with people all the time, for example working with other healthcare professionals and patients. Having good communication skills is very important to do a good job.



Research

Research what other important skills a healthcare professional needs in order to be good at their work.

The UAE is encouraging Emiratis to have a career in healthcare. For example, UAE has universities that offer excellent degrees in healthcare. The universities have very advanced laboratories and equipment. You will also have opportunities of studying outside of UAE and learning at the best universities in the world. After graduation, you will also have a stable job with a very good salary.

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4.2 Health services

What are health services?

Health services include healthcare professionals, organisations, and other healthcare workers who provide medical care to those in need.

Health services serve patients, families, communities, and populations. These services focus on making healthcare accessible and high quality for everyone. Many different types of care and people are needed to provide successful health services.

Types of health services



Discussion: Why is it important?

If you become injured or unwell, what health services would you need?

Health services cover many different types of medical issues. Many people think of family medicine and emergency care when they need to manage an illness or if they are injured or not feeling well. However, there are other health services that exist for certain illnesses or injuries. Some of the many health services include:

- ⦿ Family medicine
- ⦿ Dental care
- ⦿ Urgent treatment
- ⦿ Emergency care
- ⦿ Prenatal care
- ⦿ Physical and occupational therapy
- ⦿ Dietitians and nutritional support
- ⦿ Pharmacy
- ⦿ Mental health care



Not everyone will need each health service. However, some people may need many different health services to manage or treat their medical condition.

Health service providers



Primary care

A primary care provider is the person you would usually go to first when you are feeling unwell or have an injury. Primary care providers are the people who help to manage your overall health. They are who you go to for regular health check-ups and screenings. Primary care providers include family medicine doctors and nurses.



4.2 Health services

Secondary care

Secondary care providers are specialists in a particular area. They are the people that your primary care provider will refer you to. They will specialise in a certain area of the body or a particular disease. For example, cardiologists specialise in the heart and oncologists specialise in cancer.



Research: Specialists

Research the names of some more medical specialists you would find in secondary care.

Tertiary care

Tertiary care is specialised care usually given in a hospital setting. Patients may be referred by the primary or secondary care provider to get tertiary care for further medical investigations or treatment. Examples of tertiary care include cancer treatment, neurosurgery, cardiac surgery, and burns treatment.



Think

Think about the health services you discussed earlier. Are they examples of primary, secondary or tertiary care?

Healthcare in the UAE

The Ministry of Health and Prevention (MoHAP) is responsible for supervising health services in the country. However, healthcare is usually managed by a health authority in different emirates, such as the Dubai Health Authority (DHA) and the Department of Health in Abu Dhabi.



UNITED ARAB EMIRATES
MINISTRY OF HEALTH & PREVENTION

هيئة الصحة بدبي
DUBAI HEALTH AUTHORITY



دائرة الصحة
DEPARTMENT OF HEALTH

Healthcare services in the UAE are amongst the best in the world. The services have qualified healthcare professional, they are accessible and have very modern and advanced equipment to help treat patients in the best possible way.

4.3 Outpatient and inpatient care

What is outpatient care?

Outpatient care involves medical procedures, tests, and services that can be provided to the patient in a setting that doesn't involve an overnight hospital stay.



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Types of outpatient care

Primary care clinics

This is where patients go to see a primary care doctor. The primary care doctor can direct patients to other specialised medical care, but only when needed. Examples of primary care doctors are family medicine doctors and paediatricians. They are the doctor that you visit for check-ups.

Urgent treatment centres

These centres are outpatient clinics that provide medical services for patients who need immediate treatment for illness and injuries. These patients cannot wait a day or two for an appointment with the primary care physician, however, their illness is not life-threatening or dangerous enough to require a trip to the emergency department.

Emergency departments

This department within a hospital is classed as outpatient care. Emergency departments are staffed with trained doctors, nurses, radiologists, and other healthcare professionals who provide a wide range of emergency medical services to patients suffering from traumatic injuries or illnesses. This is a common route of entry for patients from outpatient care to inpatient care.



Specialised outpatient clinics

These clinics offer care to patients in speciality areas such as cardiology (heart conditions), orthopaedics (musculoskeletal conditions), wound care, or chemotherapy treatment.



4.3 Outpatient and inpatient care

What is inpatient care?

Inpatient care starts when a person is formally admitted to a hospital by a doctor for the management and treatment of an illness. This could last from a day or two to stabilise a condition, to more than a week to recover from surgery or to receive ongoing treatment.



Keyword

admitted

a patient is given a bed and kept in hospital for at least one night

Inpatients are more likely to deal with specialised doctors. They will experience secondary and tertiary care, as compared to primary care. It is normal for inpatients to receive treatment or care from a larger group of healthcare professionals. If you stay in a hospital, you could interact with doctors, nurses, dietitians, physical therapists, pharmacists and others.

Inpatients remain in a hospital until they are discharged by a doctor.



Keyword

discharged

when a person can officially leave a place, such as a hospital



Comparing services

Below is a list of the types of treatment and services that are common in outpatient and inpatient care.

Outpatient care

- ⊙ X-rays, MRIs, and other scans
- ⊙ Blood tests
- ⊙ Minor surgeries
- ⊙ Screening tests
- ⊙ Dialysis
- ⊙ Consultations or follow-ups with a specialist
- ⊙ Routine physical exams
- ⊙ Stitches and same-day emergency care
- ⊙ Chemotherapy or radiation treatment

Inpatient care

- ⊙ Complex surgeries
- ⊙ Severe illnesses or medical issues that need to be monitored by healthcare professionals
- ⊙ Delivering a baby
- ⊙ Rehabilitation services for some mental health conditions or bad injuries



4.4 Patient rights and responsibilities

What are patient rights and responsibilities?



Discussion: Why is it important?

In groups, discuss why it is important to have patient rights and responsibilities.

A patient's rights and responsibilities are rules that need to be followed by healthcare providers and patients.

Patient rights describe how a patient should be treated in a healthcare setting.

Patient responsibilities describe how the patient is expected to behave in a healthcare setting.

Rights and responsibilities are helpful for both the patient and the medical professional.



Example

Patients have the right to be involved in any decision making about their treatment and care.

Patients are responsible for following the facility rules regarding smoking, noise and the use of electrical equipment.



Video: Know your rights

Watch the video from MoHAP that explains what to do if your patient rights are not met when visiting a healthcare facility in the UAE. Listen for the instructions on what action you as a patient should take.

Patient rights

The Department of Health - Abu Dhabi states the following as patient rights.

You have the right to:

- ⦿ be treated to the highest professional standards by licensed, qualified, and experienced healthcare providers in a properly licensed and approved facility.
- ⦿ be involved in any decision making about your treatment and care.
- ⦿ have communications in your native language or through the services of an interpreter.
- ⦿ refuse or accept treatment based on personal decisions.
- ⦿ have access to your medical records and expect those records to be up-to-date and accurate.
- ⦿ receive information on admission regarding the health care facilities regulations and relevant policies.
- ⦿ reasonable safety in relation to the healthcare facility environment and practices.
- ⦿ seek a second opinion if you want to.
- ⦿ privacy about yourself and your information.
- ⦿ be informed regarding any uncovered costs and expenses before making decisions.
- ⦿ receive treatment in an emergency situation regardless of the status of your insurance card.
- ⦿ receive information on how to make a complaint to the healthcare facility if you are unhappy about the lack of access to your rights, medical examination, treatment, behaviour of the staff or healthcare facility safety standards.



4.4 Patient rights and responsibilities

Patient responsibilities

The Department of Health - Abu Dhabi states the following as patient responsibilities.

Your responsibilities are to:

- ⦿ take your insurance card with you when you attend a healthcare facility.
- ⦿ follow any specific rules and regulations of the healthcare facility.
- ⦿ follow the treatment plan as described by your healthcare professional.
- ⦿ ask any questions if you are not clear about anything related to your health and treatment.
- ⦿ consider the rights and responsibilities of other patients and healthcare professionals.
- ⦿ not use abusive language or display unsocial behaviour to other patients, visitors, or staff.
- ⦿ show thoughtfulness to the needs of others at all times.
- ⦿ only use emergency services for very urgent problems or when you are unable to use other health services.
- ⦿ give the correct information about personal details, medical history, the medication you are receiving and your history of allergies or sensitivity to medicines.
- ⦿ face the outcomes of your own actions if you decide not to follow any advice, instructions and/or treatment plans.
- ⦿ safeguard your belongings while receiving any health care treatment.
- ⦿ keep appointments or inform staff if you are unable to attend so that the time can be used by other patients.
- ⦿ inform staff if you have any special needs when being discharged (leaving) from a hospital or clinic.





4.5 Ethics in healthcare

What are ethics?



Discussion: Ethics

Discuss what you understand by the term ethics.



Keyword

ethics

moral principles that control a person's behaviour, the way they act and how they live their day-to-day life

Ethics affect how people make decisions and lead their lives. Ethics are what is good or what is right for the person and society.

Ethics cover the following:

- ⦿ How to live a good life
- ⦿ Our rights and responsibilities
- ⦿ The difference between right and wrong
- ⦿ Moral decisions - knowing good from bad

Ethics are not always legal requirements but are what is morally right.





Further information

The difference between law and ethics

This table highlights the difference between laws and ethics.

	Laws	Ethics
Definition	rules and guidelines to enforce certain behaviours	moral guidelines followed by a person
Codes	people are required to follow these	everyone follows these based on their morals
Rules	established by the government and all people must follow them	decide the behaviour of a person
Enforce	required by law to follow certain rules	by the individual only
Decision	a rule that directly states what is right and what is wrong	what a person thinks is right and what is wrong
Characteristics	enforced and needs to be published; consistent and strictly followed	can't be enforced, doesn't need to be published; may not be consistent; not necessary to follow
Punishment	there are punishments (penalties) for breaking a law	no punishment for going against ethics
Judging	law is judged (decided legally) by legal standards	judged by moral standards
Made	created by using ethics as a guiding principle	come from a person's own moral values
Application	depends on the country, emirate, and the place of the crime	are universal and can be applied anywhere, all over the world

4.5 Ethics in healthcare

The principles of ethics in healthcare

Medical ethics are the moral principles connecting healthcare professionals to the right decisions. There are four main principles of ethics in healthcare:

- ⊙ Autonomy
- ⊙ Beneficence
- ⊙ Non-maleficence
- ⊙ Justice



Autonomy (freedom of choice):



Break it down:

au-ton-o-my

Patients should have control over what happens to their body. A healthcare professional can suggest or advise but should not force the patient into making decisions. The patient must be allowed to make their own decisions. It does not matter if the healthcare professional believes these decisions are the best for the patient.

Beneficence (for the patient's benefit):



Break it down:

be-nef-i-cence

Healthcare professionals must do all they can to benefit the patient. All procedures and treatments must be for the good of the patient. For beneficence, healthcare professionals must make sure they have a high level of skill and knowledge in their area. This includes making sure they have had good training. They must consider their patient's individual needs. What is good for one patient might not be the best thing for someone else.



Non-maleficence (do no harm):



Break it down:

non-ma-lef-i-cence

Non-maleficence means to do no harm. Healthcare professionals should not do anything to harm to the patient. The standard of care given should not put the patient at risk. A simple example of this is that a nurse should ensure to raise the side rails of the patient's bed to ensure they do not fall off and injure themselves.

4.5 Ethics in healthcare

Justice (fairness):



Break it down:

jus-tice

Healthcare professionals should be as fair as possible when offering treatments and giving out medical resources that may be in short supply. Healthcare professionals must follow all laws and legislation and be able to explain why they make certain decisions.



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Example

Sultan has a tumor. If it is not treated, Sultan could become very unwell. An operation to remove the tumor is the best treatment, but Sultan is frightened and does not want to have surgery. The doctor must work with the patient and respect the decision that he does not want to have the operation (autonomy). There needs to be a solution that would stop him from becoming more ill, which is in his best interest (beneficence). Although the surgery is the best choice, forcing Sultan to accept surgery would be harmful to him (non-maleficence). The doctor also needs to consider the impact that Sultan's choices might have on others. If he becomes more unwell, he will need another type of treatment which is very rare. This may affect others who also need the same treatment (justice).

Who regulates healthcare in the UAE?

You should remember that several authorities in the UAE regulate healthcare. These include:

- The Ministry of Health and Prevention
- Department of Health – Abu Dhabi
- Dubai Health Authority (DHA)

These groups create laws and rules for medical professionals. They make sure that all staff members are following ethical and legal codes of practice.



**UNITED ARAB EMIRATES
MINISTRY OF HEALTH & PREVENTION**



Research: Your emirate

Research who regulates healthcare in the emirate you live in.

Ethics and COVID-19

Ensuring the best quality of healthcare for everyone is extremely difficult during a pandemic. Access to hospitals, ventilators, personal protective equipment (PPE), medicines and vaccines are likely to be limited due to the number of people that need them. Healthcare regulators, such as MoHAP, set guidelines on who can access these resources. In many countries, following these guidelines could mean the difference between someone surviving or not. This is why we have ethics. All decisions must be made with an ethical reason.

Ethical dilemmas that have been seen around the world include the lack of masks for healthcare workers in the USA in 2020. Some workers had to re-use their single-use masks. The lack of hospital beds and ventilators seen in India a few months ago meant that they were only given to patients who had a better chance of survival. In some cases, patients had to share hospital beds because of the shortage.

4.6 Patient confidentiality

What is patient confidentiality?



Keyword

confidentiality

keeping information private

Patient confidentiality means that personal and medical information given to a healthcare provider will not be disclosed (shared with others). This is unless the individual has given permission to release it.



The DHA has a document called the code of professional conduct which should be followed by all healthcare professionals in Dubai. The document states that as a healthcare professional, you must:

- ① keep your patient's records confidential. Only use the information that you have collected for the reason that it was given, or where it is lawful.
- ① make sure that patient information is not shared without the patient's consent (them agreeing to this). This is except when it is required or allowed by law or when it is required to protect your patient or others from harm.
- ① not abuse the relationship with your patient and the trust your patient has in you.
- ① take suitable steps to make sure that there is no access to your patient's information without permission. You must also make sure there is no accidental release of your patient's information.

Breaching confidentiality



Keyword

breach

the process of breaking or failing to follow a law, rule, or code of conduct

Imagine you are a doctor. On your day off you meet with your friends for coffee. While you are chatting with your friends, you tell them about a patient you saw yesterday that had an embarrassing body problem because you think they will find it funny. It may seem like this is not a problem, but what if one of your friends knows the patient? What if your friends are now scared to go to their doctors with problems that they have because they think the doctor will tell their friends the same way you did?

You have breached confidentiality in this case, which is one of the main ethical laws of being a doctor.

Consequences

The consequences of breaching confidentiality are punished all over the world. They vary depending on the nature of the breach of confidentiality.

Examples include:

- ⊙ a written warning.
- ⊙ removing the individual's licence to practise as a healthcare professional.
- ⊙ trial in a court of law facing criminal charges with large fines (between 700,000 – 1 million AED) and/or imprisonment.



No matter what consequences the person faces, they will lose a lot of respect from current patients which may have taken years to build. These patients would be very likely to go somewhere else in the future for their medical needs.

4.7 Patient safety

Harm in healthcare

Every part of healthcare has a certain amount of risk. Thousands of patients around the world suffer from harm that could have been avoided or are put at risk of injury while receiving healthcare every single day. This harm has resulted in permanent injury, further illness, an increased length of stay in a hospital, or even death.



Did you know?

There is a 1 in 300 chance of a patient being harmed in a healthcare facility.

Harm to patients can be caused by a number of things. This includes:

- ⊙ the unsafe use of medication.
- ⊙ hospital infection outbreaks.
- ⊙ surgical complications.
- ⊙ incorrect or slow diagnosis.
- ⊙ accidents such as falls within a healthcare facility.
- ⊙ healthcare workers being stressed or tired.
- ⊙ administration errors.

The WHO does a lot of work globally to try to reduce harm in healthcare. They have many campaigns. More recently they have a day dedicated to patient safety called World Patient Safety Day that happens every year on 17th September.

Speak up for patient safety!

No one should be
harmed in health care



World Health
Organization



World
Patient Safety
Day 17 September





Video: Medication without harm

Watch the video showing a campaign from the WHO about giving and taking the correct medication.

Improving patient safety

While healthcare has improved it has also become more complicated, thanks to the use of new technology, medicines, and treatments. Health services generally treat older and more unwell patients. This means difficult decisions need to be made and the risk of an error is higher. Making sure patients are safe is a challenge in all countries, rich and poor.

Six main goals have been identified to improve patient safety. These are:

1. Identify patients correctly.
2. Improve effective communication.
3. Improve the safety of high-alert medications.
4. Ensure safe surgery.
5. Reduce the risk of healthcare-associated infections.
6. Reduce the risk of patient harm resulting from falls.

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The image shows a medical history form with various sections and checkboxes. A prominent yellow tag with the text "FALL RISK PATIENT SAFETY" is attached to the form. The visible text on the form includes:

- What type of reaction did you have?
☐ Obtained from patient
☐ Obtained from family
- Do you have a history of?
High Blood Pressure
Allergy to Iodine
Other Allergies
Asthma / COPD / Emphysema
Heart Disease
Myasthenia Gravis
Multiple Myeloma
Kidney Disease
Are you on L...
Neochrome...
le Cell Dis...
- What medications?
...you have?
...to the contrast?
...pretreated for today's exam?
- ...ordering
...d? ☐ Yes
...at type?
...if yes, what type?
...Unknown