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**HEALTH SCIENCE**  
**TERM 2**  
**ANSWER UNIT 5**

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## 5.1 Communicable and non-communicable diseases

### What is a disease?

#### Activity 1: What is a disease?

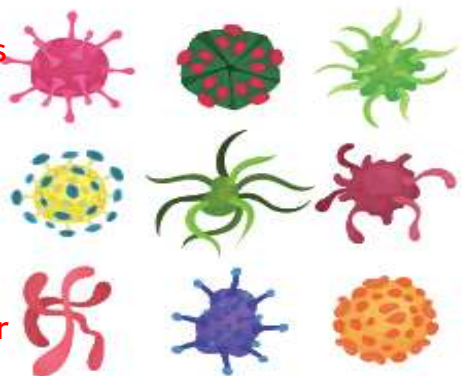
In groups, discuss the term disease: What does it mean? Can you name any diseases? How can you get a disease? Make notes in the space provided.

What does the term 'disease' mean?

A definite pathological process having a characteristic set of signs and symptoms

What diseases can you name?

How do you get diseases?



When the body is in an unhealthy state or something bad happens to the body

The definition of a disease is 'a definite pathological process having a characteristic set of signs and symptoms. It may affect the whole body or any of its parts...'

This means that a disease is when the body is in an unhealthy state or something bad happens to the body. Diseases can cause pain, parts of the body to stop working properly and in some cases, they can cause death. Any part or system of the body can be affected by diseases. It is important to understand the signs and symptoms of diseases so that the appropriate treatment can be given for them.



#### Activity 2: Disease definition

Based on your understanding of what a disease is, create a definition in your own words.

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### Communicable and non-communicable diseases

There are two types of diseases: communicable and non-communicable.

**Communicable diseases** are diseases that can be spread from one person to another. Examples of communicable diseases include the common cold, chickenpox, measles, Ebola and MRSA.

**Non-communicable diseases** cannot be passed from one person to another. Examples of non-communicable diseases include heart disease, asthma and cancer.

## 5.1 Communicable and non-communicable diseases

### Activity 3: Categorise the disease

Look at the following diseases. Discuss with your class which diseases you think are communicable diseases and which are non-communicable diseases. Do some research about the diseases if you don't know the answers. Then, assign each disease to the correct column:

Common cold    Diabetes    Heart disease    Hypertension  
 Asthma    Cancer    Osteoporosis    Osteopenia  
 Parkinson's disease    MRSA    Emphysema    Multiple sclerosis  
 Chickenpox    Motor neurone disease

Communicable diseases	Non-communicable diseases
Common cold	Cancer
MRSA	Heart diseases
Chickenpox	Asthma

### Acute and chronic diseases

Diseases can also be classed as acute or chronic. Acute means the disease is temporary or short-term. Chronic means the disease is long-term. Chronic diseases generally last three months or more.

Examples of acute diseases include the following:

- ⊙ The common cold
- ⊙ Chickenpox
- ⊙ Flu

Examples of chronic diseases include:

- ⊙ Osteoporosis
- ⊙ Tuberculosis
- ⊙ Multiple sclerosis



### Activity 4: Acute and chronic diseases

Look at the following diseases. Decide if they are acute or chronic diseases. Put them into the correct column.

Common cold    Diabetes    Heart disease    Hypertension  
 Asthma    Cancer    Osteoporosis    Osteopenia  
 Parkinson's disease    MRSA    Emphysema    Multiple sclerosis  
 Chickenpox    Motor neurone disease

Acute diseases	Chronic diseases
Cheikenpox flu	osteoporosis
	Tuberculosis
	Multiple sclerosis

### Causes of communicable diseases

Communicable diseases are caused by pathogenic microorganisms. These are also called pathogens.

Pathogens are infectious and include:

- ⊙ Bacteria
- ⊙ Virus
- ⊙ Fungi
- ⊙ Parasites



### Bacteria

Bacteria are tiny one-cell organisms that can multiply in the body and cause infections. Bacteria release toxins (poisons) that can make you feel ill. There are a number of communicable diseases that are caused by bacteria; these include typhoid, cholera, tuberculosis and whooping cough.

## 5.1 Communicable and non-communicable diseases

### Virus

Viruses are a lot smaller than bacteria. They can only multiply within another cell, and when they do this they cause a lot of damage. A virus can multiply hundreds of thousands of times and 'take over' the cell.

Because the virus multiplies so much, the cell will eventually burst open. Once this happens, the virus is spread throughout the body in the bloodstream and airways. Communicable diseases that are caused by viruses include flu, common colds, chickenpox, AIDS and measles.



## 5.2 Systems of the human body



### Activity 7: Systems of the human body

Your teacher will show you a video about the systems of the body. Answer the following about the video:

1. List the names of each of the systems from the video:

- Circulatory System
- Digestive System
- Endocrine System
- Muscular System
- Nervous System

2. Give one function for each of the systems mentioned in the video.

- Equalizes temperature in the body.
- Mechanical and chemical processes that provide nutrients via the [mouth](#), [esophagus](#), [stomach](#) and [intestines](#).
- Provides chemical communications within the body using [hormones](#).



### Activity 5: Bacteria and viruses

Your teacher will show you the video about bacteria and viruses. Make notes in the following space. Discuss with your class.

Bacteria are single-celled microorganisms that thrive in many different types of environments. Some varieties live in extremes of cold or heat.

Viruses are even smaller than bacteria and require living hosts — such as people, plants or animals — to multiply.



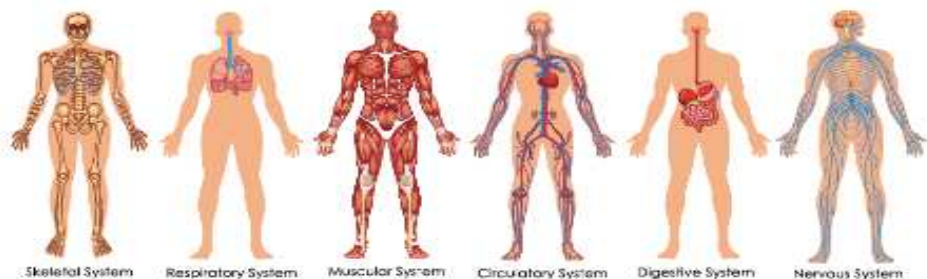
### Activity 8: Journey through the human body

Your teacher will show you the video about the human body. Which systems did you see in this video? Discuss with your class.

The human body is the structure of a **human being**. It is composed of many different types of **cells** that together create **tissues** and subsequently **organ systems**. They ensure **homeostasis** and the **viability** of the human body. It comprises a head, **neck**, **trunk** (which includes the **thorax** and **abdomen**), arms and hands, **legs** and feet.

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#### Human body organ systems



### Activity 9: Musculoskeletal system

Decide if the following statements are true or false. Write 'true' in the space provided if you think the statements are true. Write 'false' in the space provided if you think the statements are false.

- The musculoskeletal system gives your body support and allows you to move. **True**
- The musculoskeletal system is made up of muscles, bones, joints, the heart and lungs. **False**
- The main function of the musculoskeletal system is to provide form, support, stability and movement for the body. **True**
- The muscular system protects the body's internal organs and supports the weight of the body. **True**
- The muscular system keeps bones in place. **True**

There are many conditions that affect the musculoskeletal system. Musculoskeletal conditions affect people all over the world. Up to 33% of people in the world live with a musculoskeletal condition.

These include:

- Arthritis – including osteoarthritis and rheumatoid arthritis
- Osteoporosis
- Sarcopenia – a disorder of the muscles
- Spine, back and neck pain
- Other pain disorders and inflammatory diseases



## 5.3 The musculoskeletal system

### Arthritis

Arthritis is a disease that affects the musculoskeletal system. It is a term that describes pain and disease of the joints. Anyone can get arthritis. It is associated with joint pain and stiffness. Arthritis can make it more difficult to do daily tasks.

The two main types of arthritis are **osteoarthritis** and **rheumatoid arthritis**.

Signs and symptoms of arthritis:

- ☉ Pain
- ☉ Reduced motion in the joint
- ☉ Stiffness
- ☉ Swelling



### Activity 10: Arthritis

In pairs, do some research about arthritis. Choose either osteoarthritis or rheumatoid arthritis. Make notes about your findings in the following space. Share your answers with your class.

**Arthritis is a disease that affects the musculoskeletal system.**

**The two main types of arthritis are osteoarthritis and rheumatoid arthritis.**

## 5.3 The musculoskeletal system



### Activity 11: True or false



Decide if each of the following statements about osteoporosis are true or false.

- Osteoporosis is a communicable disease. **Fals**
- Osteoporosis is a condition where the bones become porous. **True**
- Weight-bearing exercise includes walking, jogging and lifting weights. **True**
- A person with osteoporosis is likely to have really good posture. **Fals**
- Having enough calcium and vitamin D can help to prevent osteoporosis. **True**
- Drinking fizzy drinks helps to prevent osteoporosis. **True**
- Osteoporosis is a condition that develops overnight. **Fals**
- A person who has osteoporosis can easily fracture bones. **True**

**TRUE**

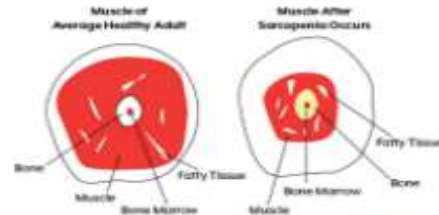
**FALSE**

## Sarcopenia

Sarcopenia is a term that describes the loss of muscle strength and muscle mass (the amount of muscle on the body). It is a disease that is associated with ageing. Lack of physical activity and poor nutrition can increase the rate of muscle loss. Sarcopenia can have effects on activities of daily living because mobility (the ability to move) can be affected.

Signs of sarcopenia:

- ⊙ Frailty
- ⊙ Functional decline
- ⊙ Reduced mobility
- ⊙ Reduced muscle mass
- ⊙ Weakness

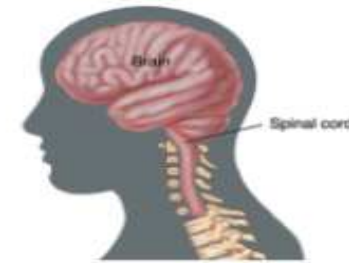
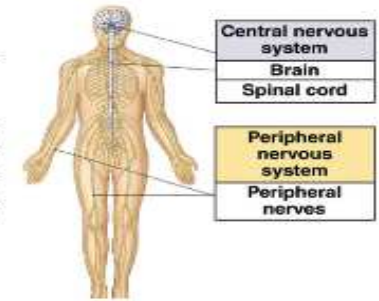


## 5.4 The nervous system

### The nervous system

The nervous system is made up of the central nervous system and the peripheral nervous system.

The central nervous system (CNS) is made up of the brain and the spinal cord. The peripheral nervous system (PNS) includes the peripheral nerves. These are away from the central part of the body and are found in the arms and legs.



Together, the CNS and PNS make up the nervous system. The peripheral nervous system is responsible for taking messages from the sensory receptors and passing on these messages to the CNS. The CNS is responsible for interpreting the messages sent by the PNS. The CNS sends messages back to the body with how it should react.

### Activity 12: Matching activity

Match the following symptoms with the correct disease or disorder.

Frailty

Stooped posture

Swelling of the joints

Reduced muscle mass

Easily fractured bones

Stiffness in a joint

Arthritis

Osteoporosis

Sarcopenia



### Activity 13: Diseases and disorders

In groups, list as many diseases and disorders of the nervous system you already know. Share your understanding of these with your class.

**The nervous system is made up of the central nervous system and the peripheral nervous system.**



## 5.4 The nervous system

### Activity 14: Motor neurone disease

In pairs, discuss how motor neurone disease can affect a person's quality of life. What might they find difficult to do? Think about what you do every day. Make notes in the space provided and explain your answers. Then share your answers with your class. Make note of anything you did not think of.

**Motor neurone disease (MND) is a disease that effects the motor neurones.**

**Motor neurones are part of the nervous system that are responsible for voluntary movement; for example, talking and walking.**

### Parkinson's disease



Parkinson's disease is a degenerative disease (a disease that gradually stops the body part that it affects from working properly). Parkinson's disease affects the central nervous system (CNS). Specifically, it affects the dopamine-producing neurones. Dopamine controls movement. When levels of dopamine decrease, it leads to the symptoms of Parkinson's disease. Symptoms of Parkinson's disease develop over time and can gradually get worse.

Signs of Parkinson's disease:

- ⊙ Difficulty concentrating
- ⊙ Fatigue
- ⊙ Freezing – unable to move from one place
- ⊙ Loss of sense of smell or taste
- ⊙ Rigidity
- ⊙ Slow movement and shuffling
- ⊙ Soft speech
- ⊙ Tremor that can be felt in the hands

### Activity 15: The nervous system

Identify which disease or disorder the following signs and symptoms relate to. Write your answers in the space provided.

Burning pain down the leg

Lower back pain

Arm or leg weakness

Slow movement

Sharp pains

Poor grip

Tremor in hands

Unable to move from a place

Sciatica

Motor neurone disease

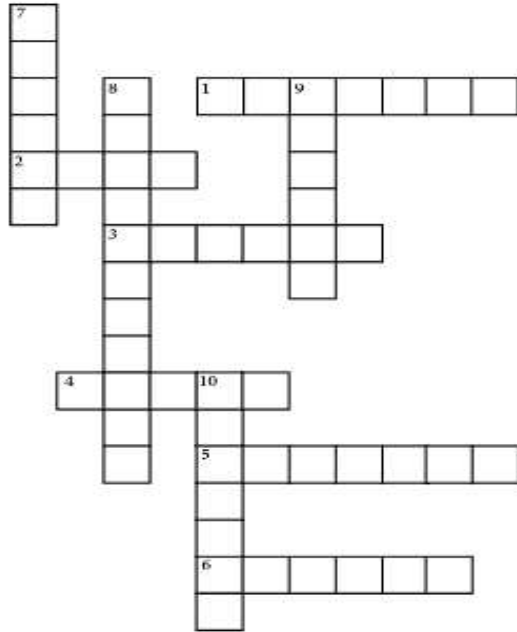
- Burning pain down the leg
- Lower back pain
- Sharp pains
- Unable to move from a place
- Poor grip
- Arm or leg weakness

Parkinson's disease

- Slow movement
- Tremor in hands

### Activity 16: Crossword

Using the clues, fill in the crossword.



**Across** →

1. Inhaling and exhaling **pharynx**
2. Air can be taken in from here **sair**
3. Breathe in **exhale**
4. Take in air and eat food from here **mouth**
5. These are at the end of each bronchus **Alveoli**
6. Happens to the lungs during inhalation **oxygen**

**Down** ↓

7. This allows people to talk
8. This system allows people to breathe
9. Breathe out
10. Another name for this is the windpipe

### Activity 17: Asthma

Have you ever had asthma? Do you know someone with this condition? What are their symptoms? What do they do to relieve their symptoms? Write your answers in the space provided.

**Asthma is a condition that makes breathing more difficult.**

**Asthma causes inflammation of the airway**



## 5.5 The respiratory system

### Emphysema

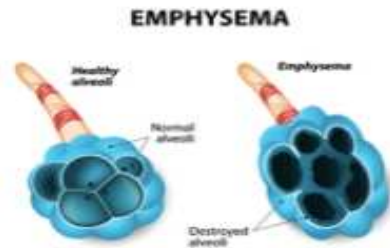
Emphysema is a long-term disease. It is classed as a chronic disease that affects the lungs. Emphysema occurs when the alveoli are damaged. Over time, the condition gets worse. Because the alveoli get damaged, it can reduce the amount of oxygen that gets to the bloodstream.

This means that when a person with emphysema exhales (breathes out), the old air doesn't fully leave the lungs. In turn, there is less room for oxygenated air to enter the lungs.

People can have emphysema for a long time without knowing it. It usually presents with shortness of breath that gets worse as more alveoli become damaged. Eventually, the person will experience shortness of breath when not exercising.

There are many things that can lead to the development of emphysema:

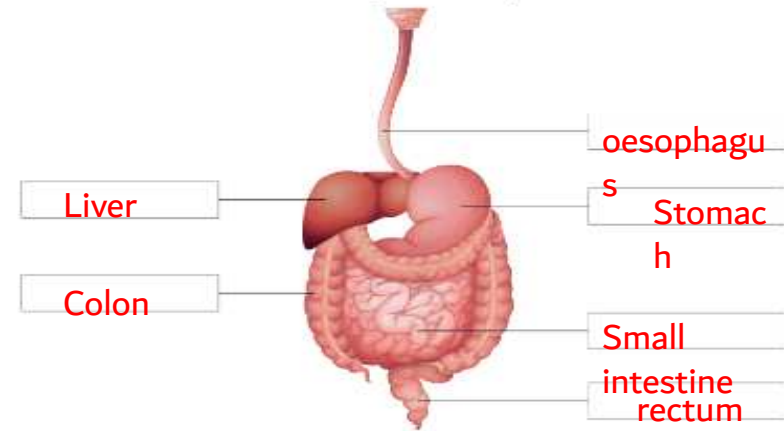
- Air pollutants
- Exposure to chemicals
- Exposure to dust
- Cigarette smoke and passive cigarette smoke



## 5.6 The digestive system

### Activity 19: Label the digestive system

#### Human Digestive System



### Activity 20: What's the difference?

What is the difference between irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD)? Write your answers in the space provided.

- IBS is a disorder that affects the digestive system.
- IBS shows no structural issues in the digestive system.
- The exact cause of IBS is not known.
- It is a different condition to inflammatory bowel disease (IBD)

## Activity 22: Circulatory system

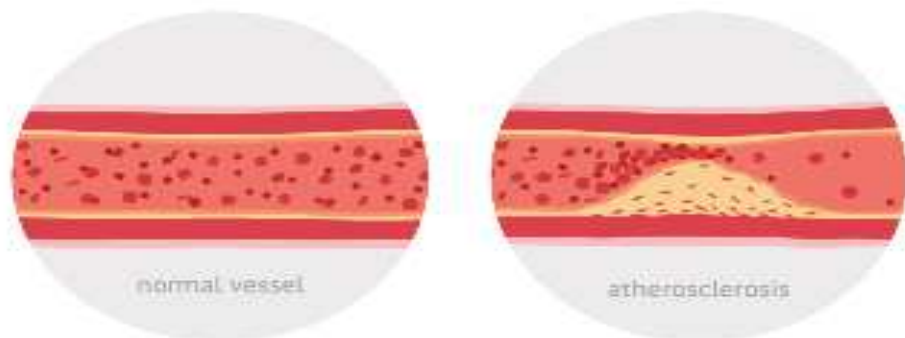
In pairs, research one part of the local circulatory system. Find the function of this part. Write your answers in the space provided. Then share your answers with your class. Make notes about the parts you did not research.

The circulatory system or cardiovascular system is a system of the body that is responsible for delivering nutrients and oxygen to all cells in the body.

## Atherosclerosis

Atherosclerosis is a disease of the circulatory system. Atherosclerosis is a term used to describe the plaque (fat, cholesterol) that builds up on the walls of the arteries. Arteries are the part of the circulatory system that brings oxygenated blood to the rest of the body.

As the plaque builds, it narrows the artery walls. This means that less blood can get through the artery. Atherosclerosis can lead to heart attacks and stroke.



## 5.7 The circulatory system

### Activity 23: Atherosclerosis

Your teacher will show you the video about atherosclerosis. Write two things you learned about atherosclerosis from watching the video.

1. Normal vessel
2. atherosclerosis

Although the exact cause of atherosclerosis is not known, there are some modifiable and non-modifiable risk factors for developing it.

Modifiable risk factors	Non-modifiable risk factors
Diet with too much saturated fat or trans fat	Age
Not enough physical activity	Family history—if a parent or parents have had it
Other lifestyle behaviours such as smoking	Gender—males are at greater risk. After menopause, women are more likely to develop atherosclerosis
Being overweight or obese	Ethnicity

### Signs of atherosclerosis:

- Atherosclerosis doesn't show any signs until there is a considerable blockage. Signs will be different depending on where the blockage is.
- If the blockage is in the artery to the heart, it can lead to chest pain.
- If the blockage is in the artery to the brain, it can affect hearing and eyes. It can also cause slurred speech and blurred vision. If these symptoms are not treated, it can lead to stroke.

Antibodies lock on to the organism that should not be in the body and they destroy them. Once the body has produced an antibody that fights off a specific pathogen, these antibodies stay in your body.

Therefore if that pathogen enters the body again, the body can destroy it more easily. For example, if you have already had a disease such as chickenpox you will usually not get it again as your body knows how to fight it. A disease or disorder of the immune system occurs when any part of the immune system does not work as it should.



### Activity 25: The immune system

Your teacher will show you the video about the immune system. Did you identify any parts of the immune system working? Make notes about what you saw in the video.

The body's immune system is responsible for fighting off disease.

It is constantly working to keep your body healthy and free from infection.

The immune system is made up of cells, tissues and organs.

These parts all work together to protect the body.

## 5.8 The immune system

### Allergy

Allergies occur when the immune system reacts to a substance that, for others, is not harmful. The immune system thinks that it is a threat to the person. This is a type of auto-immune disease. Anything can cause an allergy. People can be allergic to dust, pollen, nuts and fish amongst many other things.

When the person is exposed to the substance the body's immune system reacts as if it is harmful to the body. It develops a 'allergic antibody' called immunoglobulin E (IgE). A person can have mild allergy that leads to sneezing and watery eyes. A severe allergy can lead to anaphylaxis. This occurs when IgE antibodies are made by the immune system. You learned about this in term one.



### Activity 26: Identify anaphylaxis

What do you remember about anaphylaxis? What are the signs? How can it be treated? Discuss with your class and make notes in the following space.



Allergies occur when the immune system reacts to a substance that, for others, is not harmful.

The immune system thinks that it is a threat to the person.

This is a type of auto-immune disease.

Anything can cause an allergy. People can be allergic to dust, pollen, nuts and fish amongst many other things.

## Multiple sclerosis

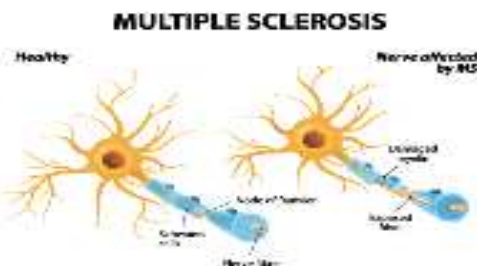
Multiple sclerosis (MS) is a disease that affects the central nervous system (the brain and the spinal cord). It is a condition that the person will have for life. This means that if it is a chronic condition, it occurs when the immune system attacks the myelin (a fatty substance that protects nerves on nerve cells). This process is called demyelination. When messages are passed through a nerve cell that has been demyelinated, the messages are interrupted.

Over time, the body stops attacking the myelin. This allows the body to develop scar tissue. It is possible for the myelin to be repaired if it is not too badly damaged. Over time, it is not as easy for the body to repair damaged myelin.

MS can show many different symptoms depending on where the nerve damage has happened.

### Signs and symptoms of MS:

- Numbness or weakness on one or both arms
- Loss of vision or double vision
- Slurred speech
- Dizziness
- Fatigue



## 5.9 Concepts of care for diseases and disorders

Most diseases and disorders will require treatment from a health professional. The patient might need the help of a health professional to make a diagnosis and to discuss and arrange a treatment plan.

Most diseases and disorders require a multidisciplinary team (a number of health professionals with different areas of knowledge) to properly care and treat the patient. This depends on their illness.

This team can include many healthcare professionals. They can work together to make decisions and recommend the best treatment for the patient. Some of these healthcare professionals include doctors, nurses, radiologists, surgeons and specialists.



### Activity 28: Types of treatment

Think about all of the diseases and disorders you have already learned about. Do you know any treatment or care that is recommended for patients with these conditions? Write your answers in the space provided and discuss with your class.

Most diseases and disorders will require treatment from a health professional.

The patient might need the help of a health professional to make a diagnosis and to discuss and arrange a treatment plan.

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### Activity 27: Multiple sclerosis

Decide if MS is an acute or chronic condition. Is it communicable or non-communicable?  
How do you think MS can affect a person's quality of life? Make notes and discuss with your class.

Multiple sclerosis (MS) is a disease that affects the central nervous system (the brain and the spinal cord).

It is a condition that the person will have for life.

## 5.9 Concepts of care for diseases and disorders

**Preventative medication**—medication can be used to help prevent the development of diseases and disorders. This can include giving calcium and vitamin D to a person who is at risk of developing osteoporosis.

**Reduce inflammation**—these are called anti-inflammatory. They reduce inflammation and can be used to treat certain conditions; for example inflammation that is associated with arthritis.

**Reduce pain**—this type of medication can be used to reduce pain caused by certain conditions. For example, painkillers are provided to patients who have multiple sclerosis who experience pain.



### Physiotherapy

#### Activity 29: Physiotherapy

You learned about physiotherapy in Term 1. What do you remember about it? Which diseases or disorders do you think physiotherapy would be useful for? Explain your answers.

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### Surgery

Some diseases and disorders require surgery. Surgery is a term used to describe the treatment that is given to a patient by a trained medical professional. This treatment is invasive (in the body).



### Manage triggers

People can manage certain diseases and disorders by identifying and managing the triggers. Triggers are the things that cause something else to happen. For example, a person with an allergy to nuts should not eat nuts. Nuts are a trigger for an anaphylactic reaction for this patient.



#### Activity 30: Triggers

In pairs, discuss the diseases and disorders you know about that can be controlled by managing the triggers. Write your answer in the space provided.

People can manage certain diseases and disorders by identifying and managing the triggers.

Triggers are the things that cause something else to happen.

For example,

a person with an allergy to nuts should not eat nuts.

Nuts are a trigger for an anaphylactic reaction for this patient.