

UNIT 2

DISEASES OF THE BODY SYSTEMS



UNIT SUMMARY

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WHAT ARE DISEASES?

Diseases and Disorders

Disease	is a medical condition that stops the body from working normally.
Sign	is evidence of a disease that can be seen by others, such as a skin rash or a cough.
Symptom	a feeling or physical change experienced by the patient, such as pain.

Classifications of Disease

Diseases can be either:

- **Communicable diseases** - can be passed or spread from one person to another.
- **Non-communicable diseases** - cannot be passed from one person to another.

Communicable diseases	Non-communicable diseases
influenza (flu)	epilepsy
COVID-19	hypertension
gastroenteritis	diabetes
malaria	multiple sclerosis

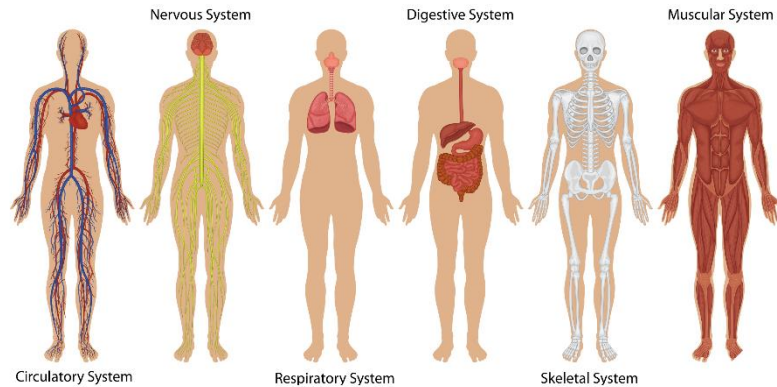
Diseases can be either:

- **Acute diseases** - last a **short** length of time, usually less than three months.
- **Chronic diseases** - last a **long** time and sometimes they last for a person's whole life.

Acute diseases	Chronic diseases
COVID-19	arthritis
common cold	diabetes
pneumonia	asthma
influenza (flu)	allergies

WHAT ARE DISEASES?

The Systems of the Body



The main systems of the body are:

- **The Musculoskeletal system** - provides the structure of the body and allows the body to move.
- **The Nervous system** - sends signals all around the body so that it can respond to stimulation.
- **The Respiratory system** - responsible for breathing.
- **The Digestive system** - breaks down the food that we eat.
- **The Circulatory system** - transports blood, oxygen and nutrients around the body.
- **The Immune system** - protects the body from illness and fights disease.

Medical Specialists

Orthopaedic surgeons specialise in the skeletal system including bones and joints.

Neurologists diagnose and treat nervous system disorders.

Pulmonologists diagnose and treat conditions of the respiratory system.

Gastroenterologists are experts on the digestive system.

Cardiologists diagnose and treat diseases of the circulatory system.

Immunologists diagnose, treat, and manage all types of allergies and diseases of the immune system.

DISEASES OF THE MUSCULOSKELETAL SYSTEM

The Musculoskeletal System Recap

The musculoskeletal system provides the body **form**, **stability** and **support** and allows the body to move. It is made up of:

- Bones
- Muscles
- Joints
- Cartilage
- Ligaments
- Tendons
- Connective tissue



Conditions Affecting the Musculoskeletal System

Conditions that affect the musculoskeletal system include:

- Arthritis
- Osteoporosis
- Osteopenia
- Rickets
- Gout
- Sarcopenia
- Spine, back and neck pain
- Other pain disorders and inflammation-causing diseases

Inflammation: a condition where a part of the body becomes swollen, red, and painful.

Arthritis

Arthritis is a **chronic** disease. It is the inflammation of the joints. This happens because of cartilage breaking down between the bones in a joint, which can result in one bone grinding directly on another.

There are over 100 different types of arthritis, but the two most common are called **osteoarthritis** and **rheumatoid arthritis**.

Who does arthritis affect?

Arthritis is more common in **adults** over the age of 65 but it can also develop in children, teenagers, and young adults. It affects more women than men. Arthritis is non-communicable.

DISEASES OF THE MUSCULOSKELETAL SYSTEM

Signs and Symptoms

- Pain and swelling around the affected joint
- Lack of motion: the joint will not be able to move as much as it should
- Stiffness after sleeping or sitting for a long time
- Grating: a feeling of bones rubbing together inside the joint

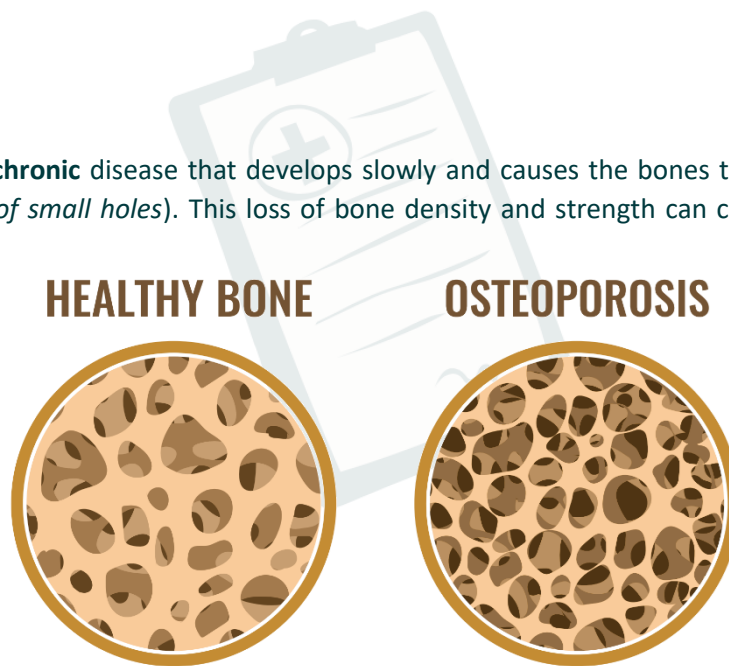
Treatment for arthritis

Arthritis can be managed by:

- **Medication** to reduce pain, inflammation and swelling.
- **Physiotherapy**, including exercises to strengthen the muscles surrounding the affected joint.
- **Surgery** to replace the affected joint with an artificial one, for example, a knee replacement.

Osteoporosis

Osteoporosis is a **chronic** disease that develops slowly and causes the bones to become **weak** and **porous** (*has a lot of small holes*). This loss of bone density and strength can cause bones to break easily.



Who does osteoporosis affect?

Osteoporosis can develop as people reach **middle-age** and it affects more women than men. It is more likely to affect people who do not exercise.

Having low levels of **calcium** and **vitamin D** in the diet can also lead to weaker bones. Around **70%** of the UAE population are **deficient** in vitamin D.

Signs and Symptoms

- Bones that break easily
- Back pain
- Stooped posture
- Loss of height

DISEASES OF THE MUSCULOSKELETAL SYSTEM

Treatment for Osteoporosis

Osteoporosis can be managed by:

- Getting enough calcium in the diet
- Reducing intake of fizzy drinks and caffeine.
- Getting enough vitamin D from food and non-food sources.
- Doing weight-bearing physical activity such as running, walking and weightlifting.
- Taking medication which slows down the weakening of the bones.

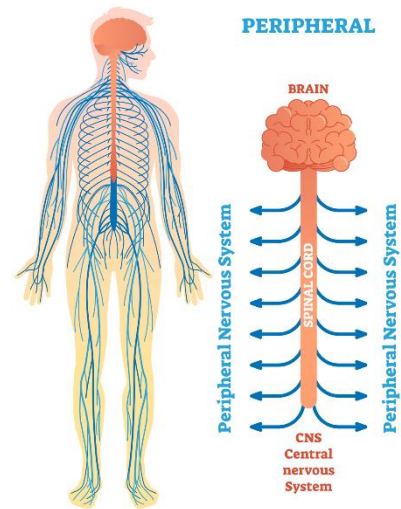


DISEASES OF THE NERVOUS SYSTEM

The Nervous System Recap

The nervous system is made up of:

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



Conditions Affecting the Nervous System

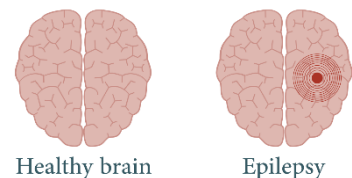
Diseases that affect the nervous system include:

- Epilepsy
- Parkinson's disease
- Alzheimer's disease
- Sciatica

Epilepsy

Epilepsy is a **chronic** disease affecting the **central nervous system**. It causes abnormal brain activity which can lead to **seizures**. Epilepsy is **non-communicable**.

Seizure: a reaction to abnormal brain activity causing sudden body movements and loss of consciousness.



Who does epilepsy affect?

Anybody can develop epilepsy, but it is more common in young children and older adults. The cause of most cases of epilepsy is **unknown**, but sometimes it is caused by a brain injury, a serious illness, high fever or stroke.

Signs and Symptoms

Seizures are the main sign of epilepsy. If somebody is having a seizure they might:

- have a stiff body with an arching back.
- have noisy, difficult breathing.

DISEASES OF THE NERVOUS SYSTEM

- have sudden uncontrolled movements.
- fall down.
- suddenly become unresponsive or unconscious.
- Grating: a feeling of bones rubbing together inside the joint

Treatment for Epilepsy

Epilepsy is usually managed by a treatment plan including:

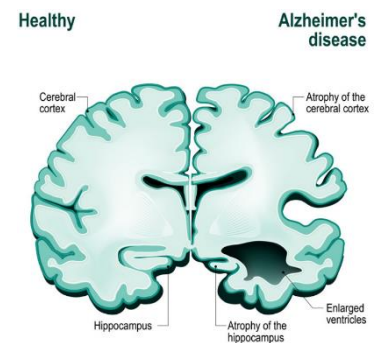
- **anti-epileptic medications** that reduce or stop the seizures.
- a **diet** that contains high levels of **healthy fats** and **low carbohydrates**.
- **brain surgery** which is sometimes used to remove or alter the area of the brain that causes the seizures.

Alzheimer's Disease

Alzheimer's is a disease that causes brain cells to **waste** away and **die**. A person with Alzheimer's will experience **memory loss** at the beginning.

Dementia a term used to describe a decline in memory, language and thinking. There are many causes of dementia but Alzheimer's is the most common.

The damage to brain cells can impact someone's way of thinking, behaving and their feelings. It is not a normal part of aging. Alzheimer's is a disease; dementia is **not**.



Who does Alzheimer's affect?

Usually affects people older than 65 years old. After age 65, the risk of developing the disease doubles every five years. The risk of developing Alzheimer's is higher for people who have a family member with the disease. **Women** are more likely to develop it than men.

Signs and Symptoms

- Difficulty remembering newly learned information.
- Forgetting people's names, or the names of everyday things.
- Getting lost in familiar places.
- Having trouble with vocabulary and following conversations.
- Difficulty concentrating or thinking.
- Behaviour changes such as mood swings or depression.

DISEASES OF THE NERVOUS SYSTEM

Treatment for Alzheimer's Disease

There is **no cure** for Alzheimer's. Some medications are available that can help with memory problems or slow down the destruction of brain cells.

There are also non-drug treatments. This includes group therapy sessions where Alzheimer's sufferers take part in activities designed to improve memory. Therapists may speak about events from the past using **photos** or **music**. This helps to improve mood and memory.

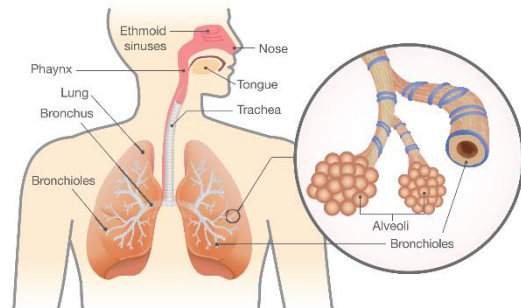


DISEASES OF THE RESPIRATORY SYSTEM

The Respiratory System Recap

The respiratory system's main function is to supply oxygen to all parts of the body. The main parts of the respiratory system are:

- the nose and mouth.
- the trachea.
- the bronchus.
- the lungs.
- the bronchioles.
- the alveoli.



Conditions Affecting the Respiratory System

Common diseases that affect the respiratory system include:

- Asthma
- Chronic obstructive pulmonary disease (COPD)
- Pneumonia
- COVID-19
- Other viruses that affect the respiratory system

Asthma

Asthma is a **chronic** disease that causes **inflammation** of the airways. When the airway becomes inflamed, it becomes swollen and makes breathing very difficult.



Who does asthma affect?

Asthma often starts in **childhood** and lasts into adulthood. It is more common if other family members have the disease, or in people who have allergies, or those exposed to smoking.

Signs and Symptoms

- Coughing
- Shortness of breath when exercising
- Tightness in the chest
- A wheezing or whistling sound when breathing

DISEASES OF THE RESPIRATORY SYSTEM

Treatment for Asthma

There is no cure for asthma, but the treatments available are very effective. They include:

- **long-term medications** which are taken daily to control the symptoms of asthma.
- medications that can be used during an asthma attack.
- **Lifestyle changes** can manage asthma. Eating a healthy diet, maintaining a healthy weight, doing regular exercise, and not smoking can all help to reduce the risk of asthma attacks.

COVID-19 (Coronavirus)

COVID-19 (Coronavirus) is caused by the virus **SARS-CoV-2** which was first discovered at the end of 2019. People infected with COVID-19 experience mild to moderate respiratory illness.

The COVID-19 virus spreads through **droplets** from the nose or mouth of an infected person when he or she coughs or sneezes. COVID-19 is infectious, therefore it is a **communicable** disease.

Who does COVID-19 affect?

Anyone can become infected with COVID-19. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious symptoms. Meanwhile, children tend to be less affected by the disease unless they have underlying medical conditions.

Signs and Symptoms

Signs and symptoms vary from person to person. Usually, they appear around **five days** after becoming infected. The most common symptoms include:

- loss of taste and/or smell
- dry cough
- fever
- tiredness
- headache
- aches and pains
- sore throat

Treatment for COVID-19

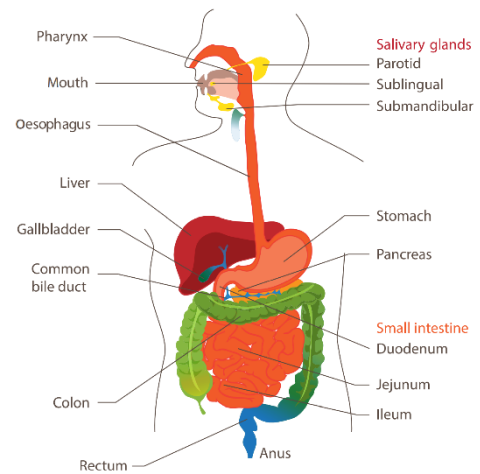
Most people will recover without requiring special treatment such as hospitalisation. For those who do require hospitalisation, they might need assistance with their breathing through a device called a ventilator. These new medicines are used to speed up the recovery of patients, reduce COVID-19-related deaths and reduce the length of time spent in intensive care units.

DISEASES OF THE DIGESTIVE SYSTEM

The Digestive System Recap

The digestive system breaks down food into nutrients for the body. The main parts of the digestive system are:

- the mouth, including the tongue, and salivary glands.
- the oesophagus.
- the liver.
- the stomach.
- the pancreas.
- the intestines.
- the colon.
- the rectum.



Conditions Affecting the Digestive System

Some of the most common digestive system problems include:

- Gastroenteritis
- Stomach ulcers or gastritis (inflammation of the stomach).
- Inflammatory bowel disease
- Irritable bowel syndrome.
- Food intolerances
- Constipation

Gastroenteritis

Gastroenteritis (*commonly known as a **stomach flu** or a **stomach bug***) happens when bacteria or viruses cause inflammation in the stomach and intestines.

It can happen as a result of **poor hygiene**, after contact with animals or after eating **contaminated** food or drinks. The disease is **acute**, usually lasts for one week but sometimes it can last a little longer.

Contaminated food: the presence of harmful substances in food which can cause illness.

Who does gastroenteritis affect?

Gastroenteritis can affect **any person** of any age. It is more dangerous for very young children, older adults and people with other serious medical conditions.

Most cases of gastroenteritis are **communicable** however there are some noncommunicable variations, for example food poisoning.

DISEASES OF THE DIGESTIVE SYSTEM

Signs and Symptoms

- Watery diarrhoea
- Cramps and pain in the stomach
- Nausea, vomiting or both
- Muscle aches
- Headache
- Fever

Treatment for Gastroenteritis

The best way to prevent gastroenteritis is to practise **good personal hygiene**. This includes washing hands after touching animals, raw food, unclean surfaces and after being in contact with other people.

There is **no cure** for gastroenteritis. However, the following steps can help to speed up recovery:

- Stop eating solid foods for at least a few hours.
- Get plenty of rest.
- Remain hydrated by drinking water.
- If the symptoms do not improve after several days, call a doctor or organise a consultation from a virtual clinic.
- For infants and children, call the doctor straight away if there is a high fever of 38.9 °C or more, or if the child is in pain or dehydrated.

Food Intolerance

Food intolerance means a person has **difficulty** digesting certain foods. Foods that people commonly have an intolerance to include:

- lactose (found in dairy products),
- gluten and eggs.

It is not a life-threatening condition, but it can be painful and uncomfortable.

Who does food intolerance affect?

Food intolerances can affect **anyone**. They can develop at any point in life. Even if someone has been able to eat certain foods in the past, they could still develop an intolerance to it in the future.

Signs and Symptoms

- Stomach pain
- Bloating
- Headaches
- Nausea
- Diarrhoea

DISEASES OF THE DIGESTIVE SYSTEM

Treatment for Food Intolerance

Food intolerances are **difficult to diagnose** as the symptoms are similar to many other digestive conditions. Usually, a dietitian will ask a person to keep a food diary for a number of days and identify the points over those days when they feel unwell or experience any symptoms of a food intolerance.

The dietitian will then ask the patient to remove **suspected** foods from their diet to see if any changes are noticed. If they stop experiencing symptoms after removing a certain food, it is likely that they are intolerant to it.



DAIRY FREE



EGG FREE



GLUTEN FREE



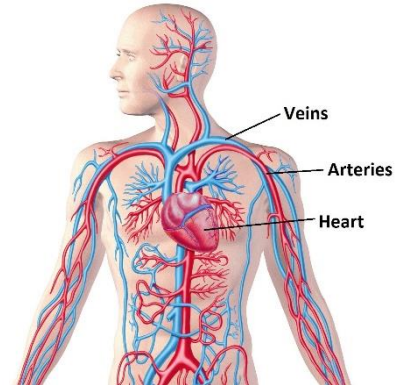
DISEASES OF THE CIRCULATORY SYSTEM

The Circulatory System Recap

The function of the circulatory system is to transport blood. Blood is pumped around the body by the heart. This blood carries nutrients and oxygen around the body.

The main parts of the circulatory system are:

- the heart.
- arteries.
- veins.
- capillaries.
- blood.



Conditions Affecting the Circulatory System

Some of the most common circulatory system problems include:

- Hypertension
- Atherosclerosis
- Angina
- Heart failure
- Stroke
- Venous thrombosis

Hypertension

Hypertension is also known as **high blood pressure**. It means that the blood pressure in the arteries is higher than it should be. This makes the heart work **harder** than normal to circulate blood through the blood vessels. It is a **chronic** condition.

A measurement for hypertension is **140/90 mmHg**. The normal blood pressure is **120/80 mmHg**. A reading between these two numbers could mean the person is **at risk** of developing hypertension.

If hypertension is not controlled, it can lead to other serious conditions including:

- **heart attack** or stroke due to hardening of the arteries.
- **heart failure**, because the heart is working too hard to pump blood.

Who does hypertension affect?

High blood pressure can affect **anyone**. The risk of developing it increases with age and if there is a family history of hypertension.

DISEASES OF THE CIRCULATORY SYSTEM

Lifestyle factors such as:

- being overweight,
- having too much salt in the diet,
- smoking,
- not doing exercise,
- and having high-stress levels

add to the risk of developing the condition.

Signs and Symptoms

Most people with high blood pressure have **no signs and symptoms**, **except** when it is **very high**. Because of this, it is important that people **regularly** check their blood pressure.

If it is very high, they could experience:

- severe headache.
- tiredness or confusion.
- vision problems.
- chest pain.
- irregular heartbeat.
- irregular breathing.



Treatment for Hypertension

The faster the hypertension is diagnosed, the less damage it will cause. Having a **healthy lifestyle** can both reduce the risk of developing hypertension and help to manage the condition after it has been diagnosed. This means:

- eating a diet low in salt, fat and caffeine,
- maintaining a healthy weight and exercising,
- and avoiding smoking.

Medications are also available that lower blood pressure and relax the blood vessels.

Atherosclerosis

Atherosclerosis happens when a **fatty substance** called **plaque** builds up in the arteries and eventually blocks blood flow.



If this happens in the **arteries** of the **heart**, it can cause a blockage which can lead to a **heart attack**. In the **brain**, it can cause a **stroke**. One of the main causes of atherosclerosis is hypertension.

DISEASES OF THE CIRCULATORY SYSTEM

Who does food atherosclerosis affect?

The narrowing of arteries happens over time. Risk factors include:

- hypertension,
- being overweight,
- having an unhealthy diet and not exercising.

It is also more common if another family member has heart disease.

Signs and Symptoms

Atherosclerosis develops **slowly**, often people do not know they have it until they have a blockage in an artery. Symptoms include:

- severe chest pain if the blockage is in the **heart**.
- weakness in the body, loss of vision and difficulty speaking if the blockage is in the **brain**.
- pain in the arms or legs if the blockage is in either of those areas.

Treatment for Atherosclerosis

The best way to manage atherosclerosis is by making **lifestyle changes** such as:

- losing weight,
- having a healthy diet,
- and exercising.

Treatment for the disease includes:

- medication which can slow the effects of the disease, including **drugs** to lower the fat (cholesterol) in the body and to lower blood pressure.
- **Surgery** to remove the plaque in the arteries or to create new arteries.

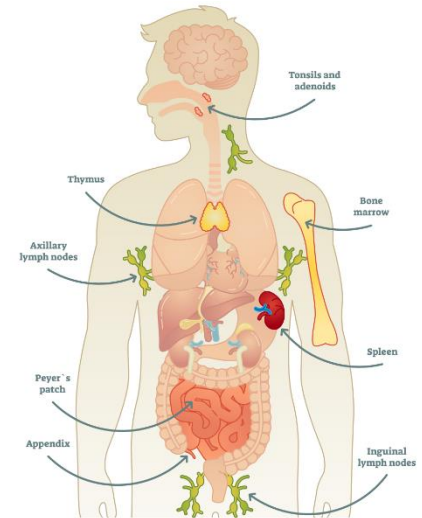
DISEASES OF THE IMMUNE SYSTEM

The Immune System Recap

The body's immune system is responsible for fighting disease. It produces **antibodies** which fights infections that enter the body.

The main parts of the immune system are:

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



Conditions Affecting the Immune System

Sometimes the immune system recognises healthy body cells as **unhealthy** ones and attacks them. This is called an **autoimmune disease**. There are around **80** autoimmune diseases affecting different systems of the body. They include:

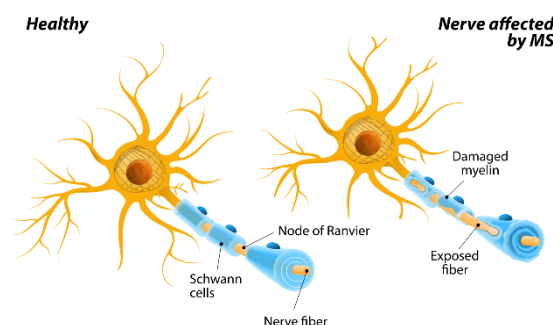
- **multiple sclerosis**, which affects the nervous system.
- certain types of **arthritis**, which affects the musculoskeletal system.
- certain **bowel** diseases, which affects the digestive system.

Allergies are also a condition of the immune system which happen when the system reacts to usually **harmless** substances.

Multiple Sclerosis

Multiple sclerosis (MS) is an **autoimmune** disease of the **brain** and **spinal cord**. It happens because the immune system attacks the **protective covering** (the myelin) of the nerve cells.

This causes damage to the nerves and **disrupts** the communication between the brain and the rest of the body. MS makes it difficult to do everyday tasks. It is a **chronic** disease.



DISEASES OF THE IMMUNE SYSTEM

Who does multiple sclerosis affect?

MS usually develops between the ages of **16-55**. **Women** are more likely than men to get the disease. The risk of developing MS is higher if a close family member has it.

Signs and Symptoms

The symptoms of the disease in some people come and go. In others, they get worse over time.

They include:

- tiredness and weakness.
- vision problems.
- movement problems.
- pain or numbness in the arms and legs.
- cognitive problems.

Treatment for Hypertension

There is **no cure** for MS, but there are some ways to **manage** the condition:

- Medication is available to slow the progression of the disease and to manage attacks.
- Physiotherapy to stretch and strengthen muscles, and to help with walking and doing day-to-day activities.

Allergy

Allergies happen when the immune system reacts to a substance such as **dust, animal hair, or a type of food**. The immune system produces antibodies which think that the substance is harmful. This can cause **inflammation of the skin, eyes, and airway**.

In some cases, allergies can cause a dangerous reaction called **anaphylaxis**. This is life-threatening.

Who do allergies affect?

Allergies can affect **anyone**. The risk is higher if there is a family history of allergies.

Signs and Symptoms

Signs and symptoms can range from **mild** to **severe**. Mild symptoms include:

- sneezing.
- watering, red, or swollen eyes.
- swelling of the face, lips, or throat.
- bumpy red rash forming on the skin.
- itchy mouth or nose.

DISEASES OF THE IMMUNE SYSTEM

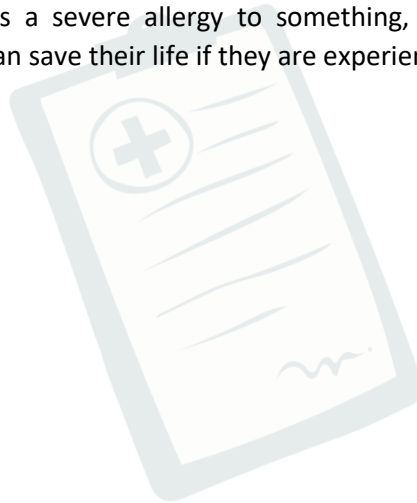
A severe allergic reaction is called **anaphylaxis**. Anaphylaxis can lead to **death**. It is a medical emergency. Signs and symptoms are:

- severe chest tightness and shortness of breath.
- skin rash.
- rapid weak pulse.
- loss of consciousness.

Treatment for Allergies

Preventing allergic reactions can be done by **avoiding** things that cause the reaction. For example, if someone is allergic to cats, they should not touch them. If someone is allergic to nuts, they should not eat any food containing nuts.

Medications can reduce the immune system reaction and improve symptoms. These are called **antihistamines**. If a person has a severe allergy to something, they might carry with them an **adrenaline auto-injector**. This can save their life if they are experiencing anaphylaxis.



UNIT 2

DISEASES OF THE BODY SYSTEMS

UNIT SUMMARY

Resources

- G12 – Term 1 – Unit 2: Diseases of the Body Systems

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