Unit 5
Disease Prevention

UNIT SUMMARY

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THE CAUSES OF DISEASE AND ILLNESS

What is a Disease or Illness?

A **disease** or an **illness** is a medical condition that stops a person's body from working properly. The reasons for developing a disease might be:

- genetics,
- environmental factors,
- or a person's lifestyle

Disease Prevention

Prevent: to stop something from happening.

Disease prevention means preventing or lowering the chance of getting a disease or illness. The best way that people can lower their risk of disease is by:

- living a healthy lifestyle.
- practicing good personal hygiene.
- having regular medical check-ups.

The Causes of Disease and Illness

The cause of diseases can be split into **two** categories:

1) Diseases caused by **bacteria**, **viruses** and **parasites** which enter a person's body and make them sick.

2) Diseases caused by a person's **lifestyle** choices, the **environment** they live in, or their **family history**.

Communicable and Non-communicable Diseases Recap

Communicable diseases are caused by **bacteria**, **viruses** and **parasites** which can be passed or spread from one person to another. They can be spread through:

- contact with an infected person,
- contaminated food or drinks,
- insect bites or the air.

Most risk factors for communicable diseases are modifiable. You can help to prevent them by:

- practising good personal hygiene.
- cleaning and disinfecting shared areas.
- staying a safe distance from people who are sick.

THE CAUSES OF DISEASE AND ILLNESS

Having a healthy lifestyle can help to prevent from getting some communicable diseases or getting as sick as somebody who does not have a healthy lifestyle.

This is because the body's immune system is more able to fight the bacteria and viruses that can make you sick. You can help your immune system stay healthy by eating foods that contain lots of different nutrients, getting enough sleep and exercising.

Non-communicable Diseases

Non-communicable diseases do not pass from one person to another. They are usually long-term diseases. **Four** of the most common non-communicable diseases are:

- cardiovascular disease
- cancer
- respiratory disease
- diabetes

Non-communicable diseases are usually **caused** by:

- having an unhealthy lifestyle,
- living in an unhealthy environment,
- genetics (family history).

People can lower their risk factors for non-communicable diseases by changing their lifestyle habits, such as **losing weight** or **stopping smoking**.

MODIFIABLE AND NON-MODIFIABLE RISK FACTORS

Risk Factors

Risk factor <mark>is something that increases a person's chance of getting a disease.</mark> The more risk factors for a disease you have, the greater your chance of getting the disease.

There are **two** types of risk factors:

- **Modifiable** risk factors are risk factors that you **can change**.
- **Non-modifiable** risk factors are ones that you **cannot change**.

Modifiable Risk Factors

Modifiable risk factors for disease include:

- Sedentary lifestyle (*lack of exercise*)
- Being overweight or obese
- Type 2 diabetes
- Smoking
- High blood pressure (*hypertension*)
- High blood cholesterol
- High stress levels

Lifestyle changes: changing long-term habits such as diet or exercise to become healthier.

The effect of modifiable risk factors can be reduced if you make lifestyle changes. Not getting enough physical activity can increase your risk of developing heart disease. You can change this risk factor by changing your lifestyle to be more physically active which can reduce your risk of getting heart disease.

Non-modifiable Risk Factors

There are certain risk factors that you cannot change. This is because you have no control over them.

If you have a parent who has heart disease, it means that you are more likely to develop heart disease as you get older. You cannot change this risk factor.
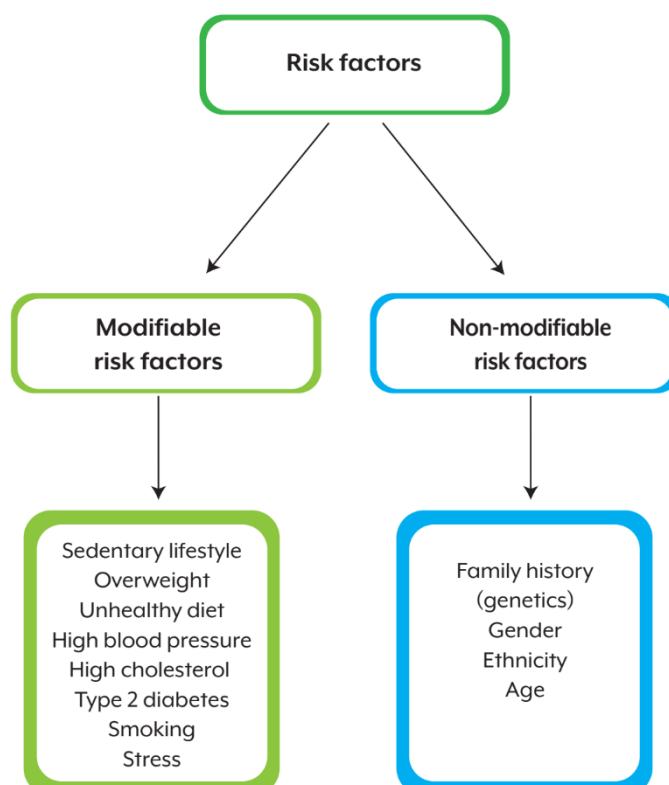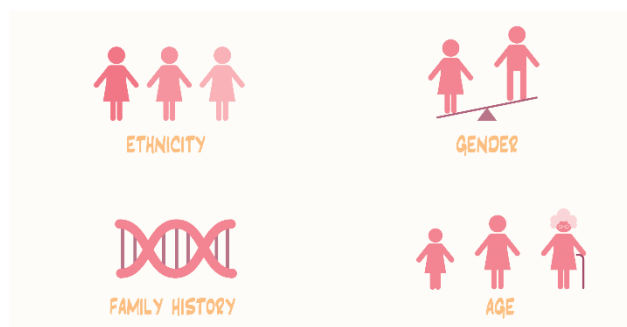
Non-modifiable risk factors include the following:

- **Gender -** You are at higher risk of developing certain diseases depending on whether you are male or female.

- **Age -** As you get older, your risk for developing certain diseases can increase.

- **Family history -** If a family member has a certain disease it could mean you are more likely to develop the same disease. This is also known as genetics.

- **Ethnicity -** Some ethnic groups are more likely to develop certain diseases compared to others.

MODIFIABLE AND NON-MODIFIABLE RISK FACTORS

Ethnicity: a large group of people who have the same customs or origin. (عِرْق)

Genetics is the study of the way that physical features and characteristics are passed from one generation to the next. As well as receiving physical features like eye colour or hair colour from their parents, a person may inherit a disease if it is carried by one, or both parents.

ETHNICITY

GENDER

FAMILY HISTORY

AGE

```
                    Risk factors
                   /            \
         Modifiable            Non-modifiable
         risk factors          risk factors
              |                      |
    Sedentary lifestyle       Family history
    Overweight                (genetics)
    Unhealthy diet            Gender
    High blood pressure       Ethnicity
    High cholesterol          Age
    Type 2 diabetes
    Smoking
    Stress
```

MODIFIABLE AND NON-MODIFIABLE RISK FACTORS

Personal Health Behaviours

Personal health behaviours are lifestyle habits that can affect a person's health. Positive health behaviours include:

- Having a healthy diet and drinking enough water
- Getting enough sleep
- Having good personal hygiene
- Being physically active
- Getting regular medical check-ups

Having good personal health behaviours and a healthy lifestyle could affect your modifiable risk factors for developing a disease.

Healthy Diet

Having a healthy, balanced diet is important to help the body stay healthy and get all the nutrients that it needs. A healthy diet can also help to prevent diseases.

Maintaining a Healthy Weight

Being overweight or obese is a risk factor for many diseases such as cardiovascular disease or diabetes. Being overweight puts pressure on the body's organs and blood vessels which can lead to a heart attack or stroke. Too much fat in the diet can cause diabetes.

Consuming Enough Nutrients

Nutrients that the body needs include protein, healthy fats, carbohydrates, vitamins, and minerals. Not including enough nutrients in the diet can increase a person's risk of certain diseases.

Without enough calcium, a person could develop a disease of the bones called osteoporosis where their bones become weak.

Controlling Cholesterol

Cholesterol is a type of **fat** that is produced by the body and found in certain foods. A small amount of cholesterol is important for the body's organs to work properly. But having too much can block the blood vessels and increase the risk of diseases of the blood vessels and heart.

Fast food, unhealthy snacks and processed foods contain high amounts of cholesterol. Limiting these foods can lower the risk of diseases caused by high cholesterol.

MODIFIABLE AND NON-MODIFIABLE RISK FACTORS

A Healthy Diet and Mental Health

Having a healthy diet not only keeps the body healthy, but it has also been shown to benefit mental health and lower stress levels. This can lower the risk of diseases such as **depression** and **anxiety**.

Improving your diet may:

- improve your mood.
- lower your stress levels.
- help you think more clearly.

Getting Enough Sleep

Sleep is one of the most important things that the body needs to maintain health and well-being. Not getting enough sleep can have negative health effects. After a bad night's sleep, people can feel tired, in a bad mood or even unwell.

Over a long time, not getting enough sleep can lead to a higher risk of diseases such as type 2 diabetes, obesity, high blood pressure, heart disease and poor mental health.

How to Get Enough Sleep

To lower the risk of diseases linked to lack of sleep, a person can make some changes to their sleep habits. They should:

- aim to get between **7-9 hours** of sleep a night.
- try to go to bed at the same time every night.
- not eat a large meal or drink caffeine before bed.
- not use televisions, laptops, or phones in the bedroom.

Personal Hygiene

Hygiene is keeping yourself and your surroundings clean. It is important for:

- killing bad bacteria (germs).
- keeping the body clean and healthy.
- stopping the spread of illness and infection.

When you wake up in the morning, you should brush your teeth, take a shower, wash your body, and put on clean clothes. All of these actions are examples of good personal hygiene.

Keeping your body and hands clean helps to stop bacteria and viruses from spreading.

MODIFIABLE AND NON-MODIFIABLE RISK FACTORS

You should wash your hands:

- before, during and after preparing food.
- before eating.
- after using the bathroom.
- after blowing your nose, coughing, or sneezing.
- after touching someone who is sick.
- before and after giving first aid.
- after touching any animals.

PHYSICAL ACTIVITY AND DISEASE PREVENTION

What is Physical Activity?

Physical activity is defined by the World Health Organization as: **"any bodily movement produced by skeletal muscles that requires energy expenditure"**. This means that anything that gets you moving and increases your heart rate can be classed as physical activity.

The Benefits of Physical Activity

Physical Health

Physical activity can improve how the body works and reduce the risk of disease in the following ways:

- **Helping to Control Body Weight**
  Exercise helps to control your weight. If you do regular exercise, you will burn a lot more calories than someone who is not very active.

- **Reducing the Risk of Certain Diseases**
  Exercise reduces the amount of harmful cholesterol and fats in your blood which keeps arteries and veins clear and helps to lower blood pressure. This can reduce your risk of heart attack and stroke.

- **Improving Bone and Muscular Strength**
  Exercise strengthens bones by increasing bone density. This helps to prevent weak bone conditions such as **osteoporosis** and reduces the risk of breaking bones. Strong muscles support joints which help to prevent injuries.

  Your heart is a **muscle** that gets stronger when you exercise regularly. Strengthening your heart can help reduce the chance of developing heart disease.

- **Improving Lung Function**
  Exercise improves the function of the lungs. It helps with how well the lungs can move air in and out of the body. As a result, more oxygen is drawn into the body, and more carbon dioxide and other waste products are removed.

Mental and Emotional Health

Exercise reduces stress and improves the mood by making the body release endorphins which can make you feel happy and improve your mood.

Endorphins: a group of hormones which are released by the brain and nervous system to reduce pain and raise pleasure and wellbeing.

PHYSICAL ACTIVITY AND DISEASE PREVENTION

Exercise can improve mental and emotional health by:

- improving energy levels. This makes you feel more alert and less tired during the day.
- improving emotional wellbeing. Most people feel calmer and better about themselves after they exercise.
- raising brain function by improving motor skills, problem-solving and increasing attention span.

Social Health

Taking part in group sports can help to:

- increase confidence.
- learn leadership skills.
- make new friends.
- increase motivation to exercise.

Having a healthy social life is important. It has been shown to improve health by reducing stress, improving heart and lung functions, and helping the body's immune system.

Recommendations for Exercise

The World Health Organization (WHO) recommends the following guidelines for exercise:

Children and Teenagers Aged 5-17 Years Old

- Should do at least **60 minutes** of moderate to high-intensity activity each day.
- Should do activities that strengthen muscles and bones at least **three times** a week.

Adults Aged 18-64 Years Old

- At least **150 minutes** of moderate-intensity physical activity or **75 minutes** of high-intensity activity each week should be done.

- For further health benefits, adults should do **300 minutes** of moderate-intensity physical activity or more each week.

- Aerobic activities such as running or swimming should last for at least **10 minutes** at a time.

- Activities that strengthen the muscles such as weight training should be done at least **two times** each week.

PHYSICAL ACTIVITY AND DISEASE PREVENTION

Exercise Intensity

Exercise intensity is how hard your body works while doing physical activity. The exact intensity of exercises will vary between different people. It will depend on your level of fitness and the effort that you put into exercises.

Moderate-Intensity Activity

Moderate-intensity activity is when you are working at **70-80%** of your maximum heart rate (MHR). You should still be able to talk comfortably during moderate-intensity exercise and you should be sweating lightly.

Examples of moderate-intensity activity include:

- Moderate walking (around 5km per hour)
- Cycling (less than 16km per hour)
- Swimming slowly
- Gardening/heavy housework
- Golf

High-Intensity Activity

A high-intensity activity is an exercise that creates a big increase in your heart and breathing rate. You should be working at **80-85%** of MHR. You should be able to speak a few words, but not hold a conversation and you will be sweating a lot.

Examples of high-intensity activity include:

- Running
- Playing sports such as football
- Swimming fast laps
- Cycling (over 16km per hour)
- Hiking in the mountains
- High-intensity aerobics

A '**sedentary lifestyle**' means that a person does not do regular physical activity. Having this kind of lifestyle puts people at risk of developing diseases associated with being inactive such as high blood pressure and cardiovascular disease.

According to the WHO, **60** to **85%** of the world's population do not exercise enough. Diseases relating to inactivity are the **4th** biggest cause of death worldwide.

MEDICAL CARE FOR DISEASE PREVENTION

How Medical Care Can Prevent Disease

there are some medical procedures that can help to prevent different diseases before they happen. Two of these are:

- **Immunisation.** This is when people are made immune or resistant to an infectious disease, usually by the injection of a vaccine.

- **Screening.** This involves testing people to see if they have any signs of a disease or illness.

Immunisation

Many countries, including the United Arab Emirates, have immunisation programmes to protect the health of their population. Immunisations involve giving people a vaccine which makes them immune or resistant to certain diseases.

Vaccine: something that is injected into a person to protect them from a disease.

How do Vaccines Work?

Vaccinations work by injecting a very small amount of the virus or bacteria that causes a certain disease into the body. It is a small enough amount so that it does not make you ill.

This makes the body's immune system create **antibodies** to fight off the injected disease. Then, if the disease enters your body again in the future, your immune system knows what it is and already has the antibodies to fight it. This is called **immunity**.

The Importance of Vaccinations

- Vaccinations save an estimated **2.5 million** lives every year.

- Vaccines reduce the risk of getting a disease by working with the body's natural defences to build protection.

- Vaccines are available to prevent more than **20 life-threatening** diseases, helping people of all ages live longer, healthier lives.

- Vaccinations are important for the prevention and control of infectious disease outbreaks.

Some vaccination programmes have been so successful in targeting certain diseases that they have eliminated the disease worldwide. **Smallpox** is one such disease. Smallpox killed **35%** of people who were infected and caused scarring and blindness in others.

MEDICAL CARE FOR DISEASE PREVENTION

Over many years, WHO used a vaccination programme to prevent people from getting smallpox. Eventually, enough people were immune to the disease which meant it could no longer spread.

UAE National Immunisation Programme

In the United Arab Emirates, there is an immunisation schedule to vaccinate children against many different diseases. The vaccination schedule starts when a child is born and usually continues until the child is in **grade 11**.

If you miss some injections when you are a child, you can still have them as an adult. Also, there are other vaccinations you can request as an adult, such as a **flu injection**, or vaccinations for when you are travelling to different countries which have a high risk of certain diseases.

The UAE vaccinates children against diseases such as:

- *Tuberculosis (BCG)*   (السُّل)
- *Hepatitis B (Hep B)*   (التهاب الكبد بي)
- *Polio (OPV/IPV)*   (شلل الأطفال)
- *Measles, mumps, rubella (MMR)*   (الحصبة والنكاف والحُميراء)
- *Varicella (chickenpox)*   (جدري الماء)
- *Influenza (Hib)*   (الإنفلونزا البكتيرية النوع بي)
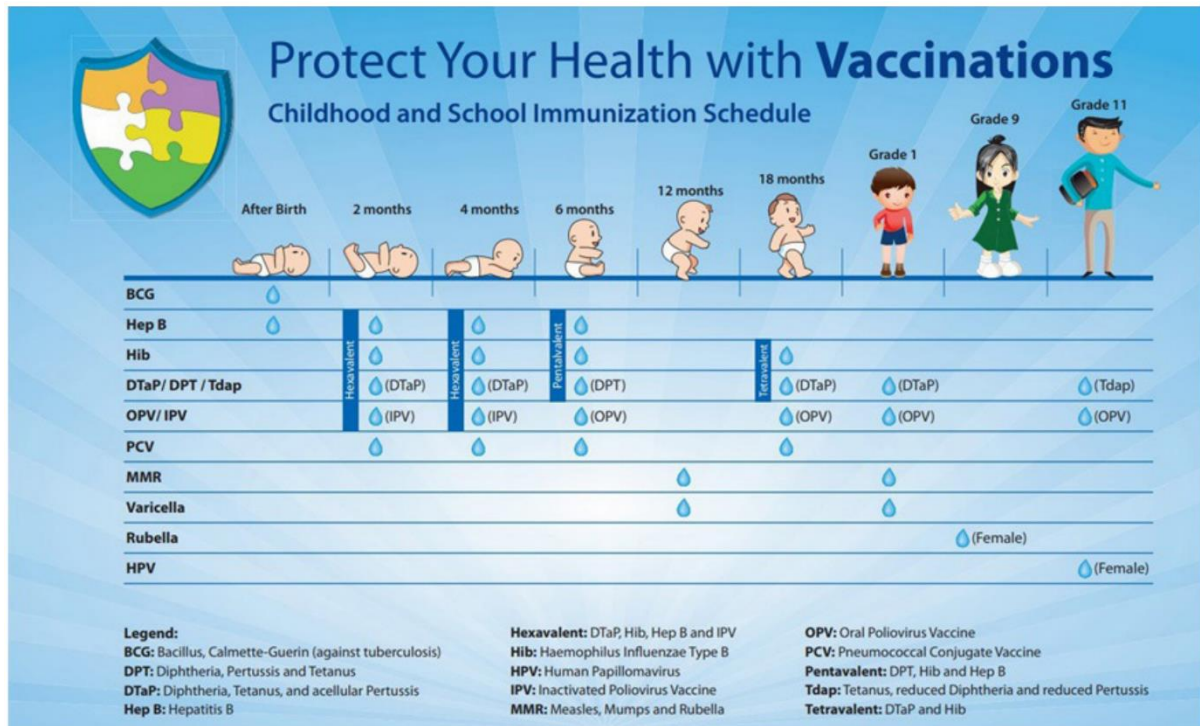
MEDICAL CARE FOR DISEASE PREVENTION

Screening

Screenings are medical tests that doctors use to check for diseases and health conditions in people before there are any signs and symptoms. Most often, screening is done on **healthy people**.

Medical screening for diseases can be done in many ways, for example,

- blood tests,
- scans,
- and physical examinations.

Regular health checks and screenings are extremely important in disease prevention. They can:

- Diagnose diseases or health issues before they start to affect you.

- Allow to get treatment early. This increases the chances of recovering from certain life-threatening diseases as cancer.

- Allow to keep track of health, such as weight and blood pressure.

- Help to have a healthier, longer life.

- Give peace of mind. Knowing that you have been screened for certain conditions can help you to stop worrying.

Diagnose: to recognise a disease or illness in someone.

Screening Tests at Different Ages

How regularly you need health checks and screenings depends on your age, gender, general health, lifestyle choices and family history.

In Your 20s and 30s

- Blood pressure
- Cholesterol and glucose levels
- BMI, waist, and hip measurements
- Dental check and cleaning
- Skin cancer checks
- Cervical screening (females only)
- Diabetes risk assessment

MEDICAL CARE FOR DISEASE PREVENTION

In Your 40s

The same as your 20s and 30s plus:

- Cardiovascular disease risk assessment
- Eye checks for glaucoma (a condition that can cause blindness)
- Breast screening (females only)
- Prostate screening (males only)

In Your 50s and 60s

The same as your 40s plus:

- Osteoporosis risk assessment
- Bowel cancer screening
- Sight and hearing tests

General Screening Tests for Adults

For	To screen for	Type of test	Screening frequency
People over 18 years old	Obesity	Body mass index (BMI) and waist circumference	Once a year
People over 18 years old	Hypertension (high blood pressure)	Blood pressure measurement	Every 2 years (more if high risk)
People over 30 years old	Diabetes High cholesterol	Fasting blood glucose/lipids test	Every 3 years (more if high risk)
People over 50 years old	Bowel cancer	Test to find blood in stools or colonoscopy	Once a year
Women 25-65 years old	Cervical cancer	Pap smear test	Every 3 years
Women 40-69 years old	Breast cancer	Mammogram	Every 2 years
Men over 45 years old	Prostate cancer	Blood test or physical examination	Every 2-3 years

MEDICAL CARE FOR DISEASE PREVENTION

What do Screening Results Mean?

If someone gets a **'negative'** result from a screening test it means they are at **low** risk of having the condition they were screened for. However, it does not mean that they will never develop the condition in the future. This is why certain screening needs to be carried out every few years.

If a person gets a **'positive'** result from screening, it means they **might have** the condition they were screened for. It will usually require further tests *(diagnostic tests)* to confirm the results. They can then be given treatment for the condition that has been detected.

The Difference Between Screening and Diagnostic Tests

The main difference between screening and diagnostic tests is that screenings are carried out on people who do not have any signs or symptoms of a disease.

Diagnostic tests are carried out when a person has signs or symptoms of a disease or has had a positive result from a general screening.

Screening tests	Diagnostic tests
To check for early signs of a disease	To confirm the presence (or absence) of a disease
For large numbers of people	For one person who has signs or symptoms of a disease, or has had a positive screening result
One simple test, such as a blood test	More in-depth testing which may include lots of different tests
Low cost, to be able to afford testing for large numbers of people	Higher costs, because of the need for more accurate testing

INFECTION CONTROL FOR DISEASE PREVENTION

How Infections Spread

Infection: a disease caused by germs that enter the body.

Three things are needed for an infection to spread:

- **A Source:** where germs are found (surfaces/skin).
- **A person:** with a way for the germs to enter their body.
- **Transmission:** the way germs are moved to a person.

What Causes Healthcare Infections?

Bacteria, **fungi**, and **viruses** can cause healthcare infections. They are mainly spread through person-to-person contact such as unclean hands or unclean medical equipment such as needles.

People who are already sick are at more risk of developing healthcare infections.

Antibiotic Resistance

Antibiotics are medications designed to kill bacteria and prevent infections from spreading. If over time antibiotics are **overused**, they are no longer as effective in killing bacteria. This is called **antibiotic resistance**. This can increase the chance of infection spreading from person to person.

What is Infection Prevention and Control?

Infection prevention and control is an approach that aims to prevent patients and healthcare workers being harmed by avoidable infections.

Up to **one in ten** patients get an infection while receiving healthcare. Infections can lead to

- patients spending more time in hospital,
- disability,
- and even death.

Healthcare workers are at risk of infection too.

Types of Healthcare Infections

Healthcare infections can happen in any medical facility, including **hospitals**, **clinics**, **dentists**, and **care homes**. They can develop while a person is in a medical facility, or soon after they leave.

INFECTION CONTROL FOR DISEASE PREVENTION

The most common types of healthcare infections are:

- surgical infections, in the area a person has been operated on.
- bloodstream infections.
- meningitis, an infection of the brain and spinal cord.   (التهاب السحايا)
- pneumonia, an infection in one or both lungs.
- a urinary tract infection (UTI), which affects the kidneys and bladder.

Preventing Hospital Infections

In healthcare facilities, it is very hard to prevent all infections. But there are ways to reduce the risks. This is called **infection control**. Ways to practise infection control include:

Infection Control Program

This means having a plan in place in every healthcare setting that explains how to identify and prevent infections.

Screening

Patients should have screening checks for infections when they enter hospitals.

Having Good Hygiene and Regular Cleaning of Facilities

All staff and patients should practise good hygiene. Hands should be washed frequently. All areas of the healthcare facility and medical equipment should be cleaned properly.

Quarantine

It may be necessary to quarantine the person who has the infection and in some cases anyone who has come into contact with this person. This is to reduce the chance of the infection spreading to more people.

Procedures for the Decontamination of People and the Environment

A specialised cleaning plan is needed for areas where a contaminated patient has been, precautions are also required for the healthcare professionals who come into contact with this patient.

Personal Protective Equipment (PPE)

Personal protective equipment (PPE) can help protect the healthcare professional from catching an infection from the patient.

INFECTION CONTROL FOR DISEASE PREVENTION

PPE for a healthcare setting can include:

- gloves
- masks
- gowns
- overalls
- eye protection

(رداء الطبيب)

Infection Control in Day-to-day Life

There are a number of healthy habits you should carry out every day to reduce your chance of becoming ill or spreading infectious diseases to others.

- Wash hand regularly and properly
- Prepare and handle food properly
- Properly clean and disinfect surfaces in the home, especially kitchens and bathrooms
- Cough or sneeze into a tissue
- Don't share personal items with others
- Stay at home when you are sick
- Avoid touching wild animals
- Get vaccinated against communicable disease such as COVID-19

INFECTION CONTROL FOR DISEASE PREVENTION

Unit 5

Disease Prevention
U N I T   S U M M A R Y

Resources

- *G12 – Term 2 – Unit 5: Disease Prevention*

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