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موقع المناهج ← المناهج الإماراتية ← الصف الثاني عشر ← علوم صحية ← الفصل الثالث ← الملف

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التواصل الاجتماعي بحسب الصف الثاني عشر



اضغط هنا للحصول على جميع روابط "الصف الثاني عشر"

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المزيد من الملفات بحسب الصف الثاني عشر والمادة علوم صحية في الفصل الثالث

[مراجعة امتحانية اختيار من متعدد نموذج ثالث](#)

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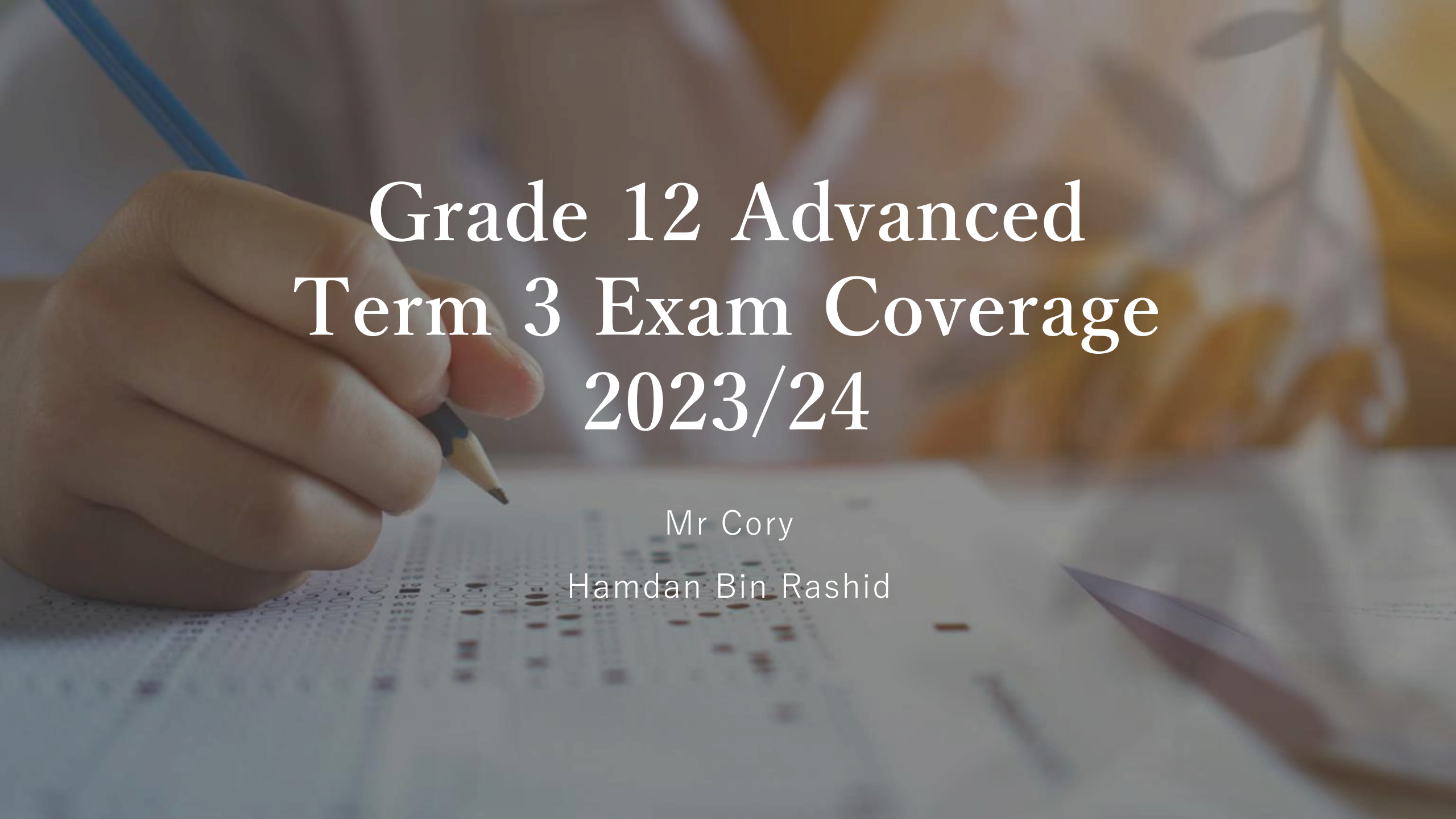
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Grade 12 Advanced Term 3 Exam Coverage 2023/24

Mr Cory

Hamdan Bin Rashid

HSC.3.9.01.006 Demonstrate an understanding of the history of systems of medicine, medicines, and pharmacy

Pharmacy is the science of collecting, preparing and dispensing drugs.

It is the clinical health science that combines medical science, chemistry and biology.

Pharmacy is the study of drug action and the effects that those drugs have on our body.

In history, the first time it was discovered that a person was treated using a drug, was in ancient (old) Greece by **Asclepius** and **Hygeia**. It is said that they used a plant to treat a wound (injury). They were considered the masters of medicine, health and hygiene.

In ancient (old) Egypt, India and China, physicians (doctors) started treating sick people using natural plants and herbs.

However, in ancient Egypt a small separation between pharmacy and medicine happened. It was decided that some physicians would visit sick people and other physicians would prepare treatments and wait for sick people to visit them.



Keyword

herbs

a plant or a part of a plant that is used to make medicines



During the Islamic Golden age (8th century to the 14th century), the separation between pharmacy and medicine happened. Muslim scientists and physicians had a lot of knowledge in chemistry and botany. This helped them discover different ways of preparing medicines, they also wrote a lot of books, which were later used by scientists in Europe.

HSC.3.9.01.006 Demonstrate an understanding of the history of systems of medicine, medicines, and pharmacy

Al Razi was a Muslim doctor, scientist and philosopher. During the Islamic Golden Age, he was the first to write books based on home treatments. His knowledge helped in the development of pharmacy and the separation of it from medicine.

The knowledge of pharmacy started spreading around the world very quickly by translating the books that were written in Arabic during the Islamic Golden Age.

In the 16th century, a law (rule) was created that didn't allow doctors (physicians) to prepare medicines for their patients. Pharmacists were the only professionals allowed to prepare medicines.



Keyword

pharmacist

a healthcare professional specialised in preparing, using, storing and providing medicine



Nowadays, the responsibility of a pharmacist depends on which type of pharmacy they practice, and if they are specialised in an area of treatment.

Example Question 1:

When did the separation between pharmacy and medicine occur?

- a) The Egyptian golden age
- b) Ancient Greece
- c) The Islamic golden age
- d) The 21st Century

Example Question 2:

Which of the following best describes pharmacy?

- a) The science of the brain and human behaviour
- b) The science of collecting, preparing and dispensing drugs
- c) The study of the digestive system
- d) The study of human growth and development

HSC.3.9.01.008 Identify the evolving roles of the pharmacists in different disciplines.

There are different types of pharmacy where a pharmacist can work, some of these include:

- ⦿ Community pharmacist – pharmacists who work in a pharmacy where you would go to buy medicines.
- ⦿ Clinical pharmacist – pharmacists who work in hospitals with doctors and nurses. They decide and advice which treatment each patient needs to improve.
- ⦿ Home care pharmacist – pharmacists who are responsible for preparing and sending medication to people who are home as they are very sick or old.
- ⦿ Research pharmacist – pharmacists who develop new drugs.

Hospital pharmacists can also specialise in different areas, such as oncology (cancer), geriatric (old age), paediatric (infants and children) and psychiatry (mental health disorders).

Example Question 3:

Ahmed is a research pharmacist who specialises in oncology. What does this mean?

- a) Ahmed works in a community pharmacy to dispense medicines to the elderly.
- b) Ahmed works in a hospital pharmacy to dispense medicines to cancer patients
- c) Ahmed works in a research facility to develop medicines that fight or prevent cancer
- d) Ahmed works in a hospital pharmacy to dispense medicines to patients with mental illnesses.

HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients

Pharmacodynamics



Break it down:

Phar-ma-co-dy-nam-ics

Pharmacodynamics is the study of what the **drug** does to the **body**. The most important points to consider in pharmacodynamics are:

- ⊙ What does the drug do to the body?
- ⊙ What receptors are activated?
- ⊙ What other effects does the drug have?

There are factors that influence pharmacodynamics, these are:

- ⊙ Patient age
- ⊙ Disease type
- ⊙ Pregnancy
- ⊙ Other drugs in the body

Pharmacokinetics



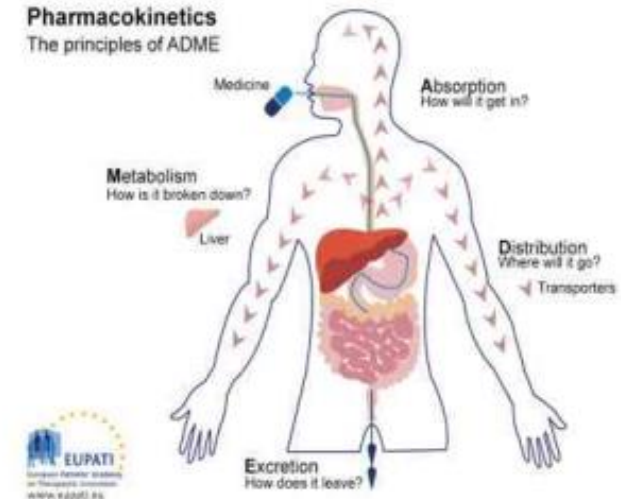
Break it down:

Phar-ma-co-ki-net-ics

Pharmacokinetics is the study of what the body does to the drug. To understand this, pharmacokinetics has four stages (parts):

- ⊙ How the medicine gets into the body: **absorption**
- ⊙ Where the medicine goes in the body: **distribution**
- ⊙ What the body does to the medicine: **metabolism**
- ⊙ How the body gets rid of (removes) the medicine: **excretion**

Pharmacokinetics The principles of ADME



HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients



Further information

Receptors

When a drug enters the body, it starts interacting with receptors. Receptors are the parts of a cell that connect to a substance and cause a chemical reaction in that cell.

There are many types of receptors for different purposes. Cell receptors can be on the outside or the inside of the cell. If they are on the outside, they are known as cell surface receptors. If they are on the inside, they are known as intracellular receptors.

When a drug connects to a receptor, the level of the response differs. There are three different levels of response.

Full agonist

When a drug connects to a receptor and produces a maximum effect

Partial agonist

When a drug connects to a receptor and produces less than a maximum effect

Antagonist

When a drug connects to a receptor, but there is no effect

Drug, medicine and excipient

The words "drug" and "medicine" can be used to describe the same thing, however, in pharmacy these two words have different meanings.



Drugs are chemical substances that are taken from plants, animals, microorganisms or minerals. Drugs are considered ingredients. They are not used directly as a treatment.

Medicines are used directly as a treatment, for example: medicines can treat a pain or cure an infection. Medicines are the result of a drug or drugs being mixed, sometimes with an excipient or without it.



Excipients are used when making medicines. An excipient helps formulating, protecting or supporting a medicine. Excipients make medicines safer for us to use. Most medicines have excipients added to them.

Example Question 4:

Pharmacokinetics describes _____.

- a) What the body does to a drug
- b) What a drug does to the body
- c) Which medicines contain excipients
- d) What type of medicine is being used

Example Question 5:

Most medicines have _____ added to help formulate, protect or support them. These make medicines safer for us to use.

- a) Drugs
- b) Excipients
- c) Metabolites
- d) Antagonists

Example Question 6:

When a drug connects to a receptor and produces a full effect, this is known as what?

- a) Full agonist
- b) Partial agonist
- c) Excipient
- d) Antagonist

Example Question 7:

Which of the following does not influence pharmacodynamics

- a) Patient age
- b) Disease type
- c) Pregnancy
- d) Hair colour

HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.

Oral

This route is the most commonly used. It is where the patient takes medication through the mouth. Drugs taken orally are normally pills or capsules. The pill or capsule is broken apart along the way to the intestines and then dissolved and transported into the bloodstream. Once it is in the bloodstream, it can act on many organs of the body including the brain.



Advantages

- ⦿ It is the easiest, safest and most cost-effective route.
- ⦿ Tablets and capsules are very stable drugs. This means they provide a very accurate dose for the patient.
- ⦿ There are "slow-release" forms available. This means that the drug releases slowly over a period of time, like twelve or twenty-four hours. Patients will only need to take a tablet once or twice a day.

Disadvantages

- ⦿ The unpredictable absorption of a drug - If there is food in any part of the digestive system, this will change the rate of absorption. Because of this, the drug will not have the expected (wanted) effect.
- ⦿ Slow absorption - Drugs taken orally are absorbed into the body slower than other routes. It takes a while for the drug to start showing any effects. If an immediate effect was needed, it would be better to use a different route of administration.

Sublingual administration

The drug is placed (put) under the tongue. It will dissolve and absorb into the blood through the tissue under the tongue.



Advantages:

- ⦿ Lower doses can be given because the drug goes straight into the bloodstream.
- ⦿ If a patient is unable to swallow tablets, this route is a good alternative.
- ⦿ If oral tablets cause the patient to suffer from side effects such as nausea, using the sublingual route is an easier alternative (way).

Disadvantages:

- ⦿ It can be uncomfortable for a patient to hold a small tablet in their mouth for a long time.
- ⦿ A patient can accidentally swallow the drug. This will take longer to have the desired (wanted) effects. Another dose cannot be given as this can lead to an overdose.
- ⦿ If the patient eats or drinks while the tablet is in their mouth, it can affect how the drug is absorbed and how well it works

Buccal administration

The drug is placed (put) between the gum and cheek. Here it will be dissolved and absorbed into the blood.



Topical

The drug is administered in the form of a cream or gel applied directly to the area that needs treatment. This is used when the area needed to be treated is easy to reach. It includes areas such as the skin, eyes, ears and nose.



Advantages

- ⦿ Easy to apply for any age.
- ⦿ Good if treatment is only needed in the specific area.
- ⦿ Low risk of side effects and affecting other drugs.

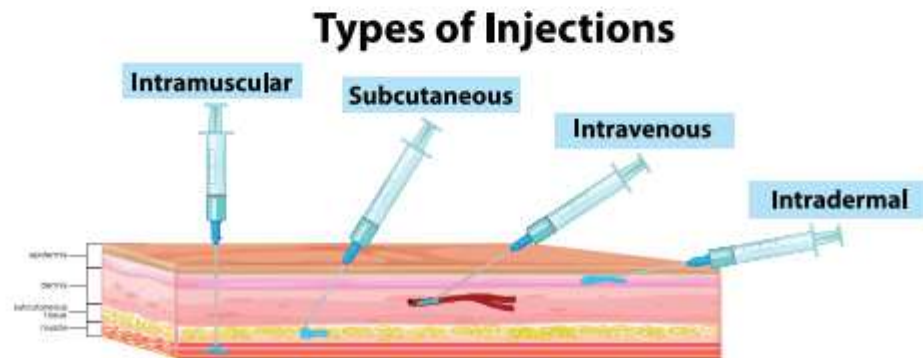
Disadvantages

- ⦿ Not well absorbed into deeper layers of the skin.
- ⦿ Absorption can be slow.
- ⦿ Creams and ointments applied to the skin can stain clothes.

Parenteral

The most common type of parenteral administration is the use of injections. There are four different types of injection, these are:

- ⊙ Intradermal – the substance is injected into layers of skin, for example, allergy testing
- ⊙ Intravenous – the drug is injected into the bloodstream through a vein, for example, saline 0.9% infusion
- ⊙ Subcutaneous – the drug is injected into the fat layer under the skin, for example, insulin
- ⊙ Intramuscular – the drug is injected into the muscle, for example, vaccines



Advantages

- ⊙ The drug action is faster, so it is suitable for use in an emergency.
- ⊙ It is useful in unconscious patients.
- ⊙ It is suitable when orally administered drugs do not work.

Disadvantages

- ⊙ They require aseptic (clean) conditions and preparation should be sterile.
- ⊙ The equipment is expensive.
- ⊙ The technique can be uncomfortable or painful for the patient.
- ⊙ Most injections cannot be self-administered as they require a trained medical professional.
- ⊙ They can be dangerous if administered incorrectly.

The table below shows the time taken for each route of administration to have an effect:

Route of administration	Time until effect
Oral	20 minutes - 1 hour
Sublingual and buccal	3-5 minutes
Topical	Variable (minutes to hours)
Subcutaneous	15-30 minutes
Intravenous	30-60 seconds
Intramuscular	10-20 minutes

Routes of administration and forms of medication:

Oral medication	Sublingual and buccal medication	Topical medication	Parenteral medication
Capsules	Small tablets	Creams	Injections
Liquids	Films	Lotions	Infusion
Pastilles	Wafers	Gels	
Powder	Sprays	Ointments	
		Sprays	
		Liquids	

Example Question 8:

Which of the following forms of medicine can be administered using the topical route of administration?

- a) Cream
- b) Capsules
- c) Injections
- d) All the answers are correct

Example Question 9:

The doctor has explained to Latifa that since her body cannot produce insulin by itself, she should regularly be injected with insulin into the fat layer under the skin. Which type of injection is this?

- a) Intradermal
- b) Intravenous
- c) Intramuscular
- d) Subcutaneous

Example Question 10:

Which of the following routes of administration involve placing the drug under the tongue?

- a) Oral
- b) Sublingual
- c) Buccal
- d) Topical

HSC.3.9.01.002 Identify the appropriate use of antibiotics.

What are antibiotics?



Break it down:

An-ti-bi-ot-ics

Antibiotics are medicines that destroy or slow the growth of bacteria. They include a range of strong drugs and treat diseases which are caused by bacteria.

Using antibiotics

People usually take antibiotics orally. They can also be administered via an injection or directly applied to the part of the body that is infected.

Most antibiotics begin fighting bacteria within a few hours. It is important to complete the whole course of medication even after symptoms of the infection have improved. This means you should take all of the antibiotics that you have been prescribed by the doctor even if you feel well. By doing this, it reduces the risk that bacteria will become resistant to the antibiotics.

Antibiotic resistance



Keyword
resistance

stopping something from having an effect

Medical professionals believe that people are overusing antibiotics. This overuse is making more bacteria resistant to antibiotics. In other words, the antibiotic becomes useless against the bacteria because the bacteria have improved their defences therefore are not destroyed by the antibiotic.

Antibiotics can cause the following common side effects:

- ⊙ diarrhoea
- ⊙ nausea
- ⊙ vomiting
- ⊙ rash
- ⊙ upset stomach

Less common side effects:

- ⊙ kidney stones
- ⊙ blood clotting
- ⊙ blood disorders
- ⊙ bowel inflammation



Antibiotics should only be prescribed to treat conditions:

- ⊙ that are unlikely to be cured without the use of antibiotics.
- ⊙ that could spread if not treated.
- ⊙ where antibiotics can significantly speed up recovery time.
- ⊙ where the risk of not prescribing antibiotics can lead to more dangerous complications.

Example Question 11:

Which of the following diseases can be treated by taking antibiotics?

- a) Covid-19
- b) Influenza
- c) Diabetes
- d) Tonsillitis

Example Question 12:

Which of the following is a common side effect of using antibiotics?

- a) Kidney stones
- b) Blood clotting
- c) Upset stomach
- d) Blood disorders

Example Question 13:

How long will it take for antibiotics to start fighting bacteria after consumption?

- a) A few minutes
- b) A few hours
- c) A few days
- d) A few weeks

HSC.3.9.01.007 Interpret basic Latin prescription abbreviations

Common abbreviations used in healthcare:

Measurements	
Abbreviation	Meaning
kg	kilogram
g	gram
mg	milligram
mcg	microgram
ml	milliliter
tsp	Teaspoon (5ml)

Routes of administration	
Abbreviation	Meaning
IM	intramuscular
IV	intravenous
PO	by mouth
SC	subcutaneous
SL	sublingual
TOP	topical

Other abbreviations

Abbreviation	Meaning
Dr.	doctor
XR	X-ray
Dx	diagnosis
Sx	symptom
Tx	treatment
FBC	full blood count
BP	blood pressure

Common Latin abbreviations used in prescriptions:

Prescriptions		
Abbreviation	Latin	Meaning
Rx	praescriptus	prescription
ac	ante cibum	before meals
pc	post cibum	after meals
hs	hora somni	at bedtime
prn	pro re nata	as needed
stat	statim	give now
ad	ad libitum	as desired/wanted
bid	bis in die	twice a day
tid	ter in die	three times a day
qid	quarter die sumendus	four times a day

Example 1

Prescription:

"Rx Captopril 25mg, i, SL, STAT, high BP"

Interpretation:

"Prescription: Captopril 25 milligrams, one tablet, sublingual, give now. This medication is being administered because the patient has high blood pressure"

Example Question 14:

Use the information in the prescription to identify how often the patient must take her tablets.

- a) Twice a day
- b) Three times a day
- c) Four times a day
- d) Once a day

Emirates Pharmacy Sheikh Rashid Blvd, Dubai, U.A.E	
Name: Hessa Al Hammadi	D.O.B.: 01/05/2008
Address: Downtown Dubai	
	Date: 09/06/2023
R_x	Ciprofloxacin 500mg i, PO, bid, respiratory tract infection

Example Question 15:

Use the information in the prescription to identify the route of administration for Ciprofloxacin 500mg.

- a) Intravenous (parenteral)
- b) Topical
- c) Buccal
- d) Oral (By mouth)

Emirates Pharmacy Sheikh Rashid Blvd, Dubai, U.A.E	
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HSC.3.9.01.004 Demonstrate competence in a broad range of basic, scientific, and pharmaceutical calculations.

Common unit conversions

It is important to be able to convert (change) commonly used units of measurement. Correct unit conversion makes sure the wrong dose of a medication is not given to a patient.

Solids		
1 kg = 1000g	1g = 1000mg	1 mg = 1000mcg
3 kg = 3000g	4 g = 4000mg	2 mg = 2000mcg

Volume	
1000ml = 1L	5000ml = 5L

Time	
60 sec = 1 min	60 min = 1 hour
180 sec = 3 min	120 min = 2 hours

Drug formulas in pharmacy

Calculating drug dosages

Tablet dosage

This is used to calculate how many tablets will be needed to fill a prescription from a doctor. This is also known as the "basic formula".

$$\text{Prescribed dose} \div \text{stock strength} = \text{number of tablets needed}$$



Example

The doctor prescribed 120mg of a drug. The drug is only available in 30mg tablets. How many tablets should be given to the patient?

Answer:

Prescribed dose	Equation	Stock strength	Equals	Tablets to take
120 mg	÷	30 mg	=	4

The doctor prescribed 200mg of a drug. The drug is only available in 40mg tablets. How many tablets should be given to the patient?

Answer

Prescribed dose	Equation	Stock strength	Equals	Tablets to take
200 mg	÷	40 mg	=	5

Mixtures and solution

To calculate the amount of a solution that should be given **to the patient** we can use the following formula.

$$\text{Desired dose} + \text{stock strength} \times \text{stock volume} = \text{amount of solution}$$



Example

The doctor prescribed 120mg paracetamol liquid four times a day. The drug is available in 250mg/5ml. How much liquid is needed per dose?

Answer:

Desired dosage	Equation	Stock strength	Equation	Stock volume	Equals	Amount of solution required
120mg	+	250mg	X	5ml	*	2.4ml per dose

Calculate IV rate

This calculation is used mainly in a hospital setting. It calculates the rate of administration of IV fluids. This can be calculated over either minutes or hours.

$$\text{Total IV volume} \div \text{time (hours or minutes)} = \text{ml administered per hour or minute}$$



Example

The doctor wants to administer a drug intravenously. 120ml of liquid X needs to be administered by IV over a period of six hours. How much liquid is administered per hour?

Answer:

Total IV Volume	Equation	Time (Hours)	Equals	mls administered
120ml	÷	6	=	20ml per hour

Example Question 16:

A patient requires 600 ml of an intravenous (IV) fluid to be administered over a period of 4 hours. Use the formula below to calculate how much liquid is administered per hour.

$$\text{Total IV volume (ml)} \div \text{time (hours)} = \text{quantity administered per hour (ml)}$$

- a) 66.67 ml
- b) 150 ml
- c) 2400 ml
- d) 300 ml

Example Question 17:

There is 5mg of prednisolone in one tablet. The doctor wants the patient to take 40mg once daily at 7am. How many tablets should the patient take at 7am?

Prescribed dose ÷ stock strength = number of tablets needed

- a) 2
- b) 4
- c) 6
- d) 8

HSC.3.9.01.009 Demonstrate an understanding of essential communication skills applied to pharmacy.

Written and verbal communication are the two most used methods of communication in healthcare. Communicating effectively can prevent a lot of medical errors, such as drug errors. Therefore, an important part of safety measures is effective communication.



Discussion: Latin abbreviations in the future

What are the most common medical errors that could happen in a hospital because of poor communication?

Pharmacists usually communicate with other healthcare professionals through written and verbal communication. This includes doctors, nurses, other pharmacists and pharmacy technicians. Communication also happens with patients and sometimes their families, mostly regarding prescriptions. Good communication skills help to:

- ⊙ ensure patient's safety
- ⊙ avoid drug errors
- ⊙ deliver better treatment for the patient
- ⊙ build good relationships with patients.



How can pharmacists ensure patient safety through good communication?

Effective communication skills can improve patient safety. There are many ways to make communication more effective, for example using and remembering the 5 C's of effective communication. The 5 C's involve remembering to be:

1. Clear
2. Cohesive
3. Complete
4. Concise
5. Concrete

1. Clear

What exactly do I want to communicate?

2. Cohesive

Does all the information make sense?

3. Complete

Have I communicated all the information?

4. Concrete

Am I being as specific as possible?

5. Concise

Am I being direct and brief? Or am I using words that are not needed?

Safety measures administering medication

Nurses are mostly involved in the administration of drugs in a hospital. At home, the administration of drugs can be given by a responsible person. There are six rules to follow if you are asked to give drugs to a family member. These rules are known as 'the six rights of drug administration'.

The six rights of drug administration

1. Right drug

The correct drug must be given to the patient. Errors can happen when the pharmacy dispenses the wrong drug. A caregiver can also administer the wrong drug to a patient. This sometimes happens if the drugs have similar names. Always make sure you are using the correct drug every time you administer them.



2. Right patient

Give the drug to the right patient. Errors can happen at the pharmacy when two people have very similar names. At home, there may be many medications for different people kept in the same place. To avoid this, the caregiver should double-check the patient's name and date of birth when collecting and administering the drug.

3. Right dosage

Give the medication at the correct dose as directed by the doctor. If you are not sure, **you** should always check with the patient's doctor or pharmacist.



4. Right route of administration

The medication should only be given by the route it was prescribed for by the doctor. Healthcare professionals, especially nurses, should be aware of the usual route of administration of each drug. Nurses are responsible of training patients or caregivers how to administer drugs correctly.



5. Right time

The medication should be given at the correct time as prescribed by the doctor. Thirty minutes before or after the prescribed time is acceptable. Be aware that some medication must be taken on an empty stomach and some medication should be taken with food. Healthcare professionals should know this when giving you advice.

6. Right documentation



If a nurse administers medication, they should make a record as soon as possible. This is so another nurse will not double the dose. This is also useful at home. You should record:

- ⊙ When (what day and time)
- ⊙ What (medication, dose, route)
- ⊙ Any side effects

Example Question 18:

Which of the following is **NOT** one of the 5 C's of effective communication?

- a) Clear
- b) Concise
- c) **Complicated**
- d) Complete

HS.4.2.01.001 List the causes of foodborne illness

What are foodborne illnesses?



Keyword

foodborne

when something is carried through food

A foodborne illness is an illness that happens because of eating foods that contain disease-causing microorganisms. The most common disease-causing microorganisms found in food are bacteria, but can also include viruses, fungi, parasites, or chemicals.

Most foodborne illnesses happen suddenly and last a short time. They can happen from 6–72 hours after eating contaminated food. Most people recover on their own without treatment. Sometimes, foodborne illnesses may cause more dangerous complications.

Bacteria

Harmful bacteria may already be in foods when you buy them. Raw (not cooked) foods may be contaminated with bacteria that cause foodborne illness. Contamination can happen very easily, it can happen during:

- ⊙ growth.
- ⊙ harvesting.
- ⊙ slaughter (when animals are killed to be eaten).
- ⊙ processing.
- ⊙ storage.
- ⊙ transportation.
- ⊙ preparation in a kitchen.



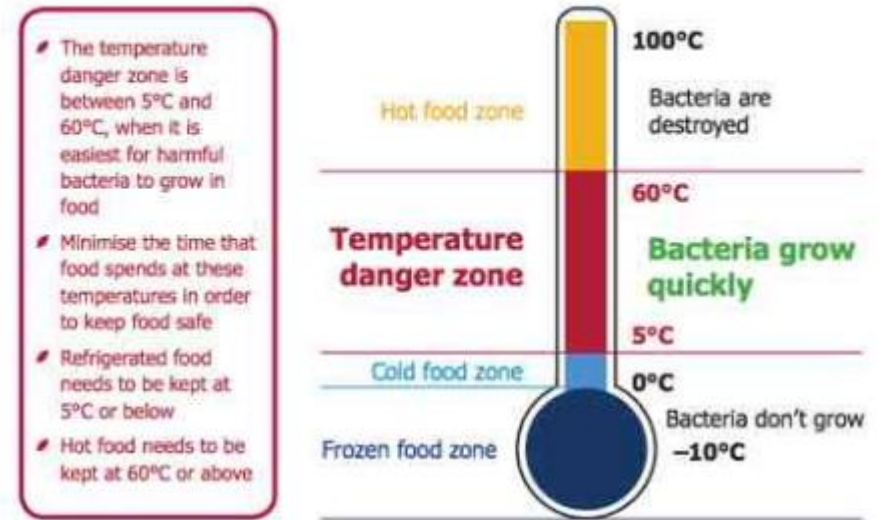
Bacterial growth

Bacteria grow by multiplying and they can do this very quickly. They need certain conditions to grow. These conditions are:

- ⊙ **Time:** Bacteria double every 15 minutes. This means that within six hours, one bacterium can multiply to over 16 million.

- ⊙ **Food:** Just like people, bacteria need nutrients to grow. Meat, seafood, cooked rice, cooked pasta, milk, cheese and eggs are all foods that provide very good growing conditions for bacteria.

Warmth: Bacteria need warmth to multiply. The ideal temperature is 37°C. They can multiply in temperatures between 5°C and 60°C.



- ⊙ **Water:** Bacteria need moisture to grow.

High-risk foods

Some foods are more likely to make you sick than others. This is because these foods are more at risk of bacterial growth. If they are not cooked to a safe temperature, or stored or handled properly, there is a higher chance they will make you sick.

Most foodborne illnesses develop quickly. However, some can take days to develop, so it can be difficult to find the exact cause of the illness. Knowing which foods to be extra careful with when storing, handling and cooking is helpful.

Poultry

Raw and undercooked poultry can be dangerous. Small amounts of bacteria can make people very sick. Cooking to a safe temperature normally kills dangerous bacteria. Avoid washing raw chicken as this will spread the bacteria around the kitchen. Wash and sanitise anything that raw poultry has touched.



Eggs

Raw and undercooked eggs are also high-risk. Bacteria can live in the yolk (yellow part), the white part of the egg and on the eggshell. Normally the egg will not look, smell or taste any different.

Seafood

From the moment a fish is caught until it is eaten, it must be stored correctly. There are many different bacteria and toxins that can cause foodborne illness from fish. Fish can become contaminated through sewage in the water where they live. Even cooking to at high temperatures cannot kill some of the toxins found in seafood.

Vegetables

Vegetables are a common source of foodborne illness, especially when eaten raw. They can become contaminated at many stages from growth to storage to preparation. Leafy green vegetables are especially dangerous as they are usually eaten raw. It is important to wash vegetables before eating them.

Rice

Sometimes bacteria can live in uncooked rice. Cooked rice provides heat, moisture and food which are perfect conditions for bacteria to multiply.

Example Question 19:

Which of the following temperatures is ideal for bacterial growth?

- a) -10 degrees C
- b) 0 degrees C
- c) 37 degrees C
- d) 70 degrees C

HS.4.2.01.002 Explore the concept of cross-contamination.

What is cross-contamination?

Contamination is when food becomes dangerous because it contains harmful or unwanted substance like bacteria. Cross-contamination is how bacteria can spread in food. It happens when bacteria from another object or piece of food, come into contact with 'clean' food. This happens when raw food touches cooked food. Cross-contamination can result in food poisoning.

Food-to-food

This is when contaminated food comes into contact with 'clean' food. Raw, undercooked or unclean food can contain large amounts of bacteria which can spread to other food that comes into contact with it. This can happen if you let raw food touch clean food, or if the the juices (liquid) from raw food drips onto other food, either in the fridge, shopping trolley or while preparing food.

People-to-food

It is easy for humans to transfer bacteria from their body or clothes to food during food preparation. Not washing hands regularly when handling food can cause contamination.



Example

If a person coughs into their hand or touches raw chicken, then touches 'clean' food without washing their hands, it can cause contamination.

Equipment to food

This is one of the most common types of cross-contamination.

Bacteria can live for a long time on surfaces like countertops, cutting boards, utensils (knives and forks), storage containers and factory equipment. Therefore, it is very important to wash all surfaces and equipment properly using soap and hot water.

Prevent cross-contamination

Use the correct colour coded chopping boards and knives

Raw meats and poultry only

Raw fish and shellfish only

Raw unwashed vegetables, salads and fruits only

Ready to eat and cooked foods only

Washed vegetables, salads and fruits only

Bakery and dairy products only

Food Hygiene Act 1995

Example Question 20:

Maitha used a knife to cut some cooked vegetables. The knife had not been washed properly, this caused harmful bacteria to be transferred from the knife to the vegetables. Which type of cross-contamination is this?

- a) Food-to-food
- b) **Equipment-to-food**
- c) People-to-food
- d) Allergen-to-food

HS.4.2.01.004 Identify the importance of proper hygiene practices.

1. Keep clean

Just because something looks clean it does not mean that it is. It takes over 2.5 billion bacteria to make 250ml of water look cloudy. However, in some cases, it only takes twenty harmful bacteria to make a person sick.

Why is it important?

Dangerous germs are widely found in soil, water, animals and people. These germs are carried by hands, clothes and kitchen equipment. The slightest contact can transfer germs to food and cause foodborne diseases.

Cleaning plates and kitchen equipment

Some general advice from the WHO includes the following:

- ⦿ Clean while preparing food so bacteria do not have a chance to grow.
- ⦿ Give a lot of attention to equipment that may touch both raw food and cooked foods and anything that will touch someone's mouth.
- ⦿ Sanitise cutting boards and equipment after they have been in contact with raw meat or seafood.
- ⦿ Don't forget to clean and dry the cleaning equipment as bacteria grow fast in damp (slightly wet) places.



Handwashing

Hands transfer germs from one place to another, so handwashing is very important. You should wash your hands:

- ⦿ before, during and after handling food.
- ⦿ before eating.
- ⦿ after going to the toilet.
- ⦿ after blowing your nose.
- ⦿ after handling rubbish.
- ⦿ after handling cleaning products.
- ⦿ after touching animals or playing with pets.



By now, you should be very familiar with how to properly wash your hands.





Think

Know the difference between cleaning and sanitising. Cleaning is the process of physically removing dirt and crumbs of food. Sanitising is the process of killing germs or disinfecting.

Protect food from pests

Pests include cockroaches, mice, rats, flies and insects. They can pass harmful germs onto food and kitchen surfaces. Pets carry pests in their fur or their feet. Do the following things to keep food safe from pests:



- ⦿ Food should be covered or in closed containers.
- ⦿ Rubbish bins should be covered and rubbish should be removed regularly.
- ⦿ Food preparation areas should be in good condition (repair cracks or holes).
- ⦿ Keep house pets away from food preparation areas.

Example Question 21:

Which of the following best describes the process of sanitising?

- a) Physically removing dirt and crumbs of food
- b) Killing germs and disinfecting
- c) The transfer of bacteria from hands to food
- d) Separating raw and cooked foods

HS.4.2.01.005 Compare and contrast food allergies and food intolerances

A food allergy is when the body's immune system responds abnormally to certain foods. When you have a food allergy, your body reacts to the food and tries to fight against it. It might handle harmless substances in the food you eat and see them as a threat. This tells the body to release chemicals which cause an allergic reaction. Food allergies can be so severe that they cause a reaction called anaphylaxis. They can even be life-threatening.

Common causes of allergy

Foods that commonly cause allergies are called allergens. Some examples of allergens include:

Peanuts (and other nuts)	Shellfish
Eggs	Fish
Gluten	Milk and dairy foods
Mustard	Sesame seeds



Further information

The rise in food allergy cases

The number of people with food allergies has risen a lot over the past few decades. The reason for this is unclear but there are a couple of theories that suggest why. One theory is that the typical child's diet has changed a lot over the last thirty to forty years. Another theory is that children are growing up in 'germ-free' environments. Their immune systems might not develop properly because they are not exposed to germs. When they eat certain foods, their bodies mistake harmless substances for bacteria, and they think they are being attacked, causing an allergic reaction.

Food intolerances

Food intolerance happens when the body cannot properly digest the food that is eaten. It can also happen when a particular food irritates the digestive system. It can be difficult to know if a person has a food intolerance as the symptoms are similar to other conditions. Reactions due to food intolerances are not life-threatening.

Types of intolerances

Some common types of food intolerance are:

Lactose	Caffeine
Gluten	Histamine in mushrooms and pickles
Additives e.g. artificial sweeteners, colouring or flavours	

Lactose intolerance

This is one of the most common intolerances. It happens when a person has digestive problems after eating dairy products. Their body cannot digest lactose which is a natural sugar found in milk, yoghurt and soft cheeses.

Gluten intolerance

Many people experience digestive problems caused by gluten, but not all of these people are gluten intolerant. Gluten is a protein in wheat, barley and rye. It is used in foods like bread, pasta, cereal, pastries, cookies and doughnuts.

The following table shows a comparison between the signs and symptoms of food allergies and food intolerances.

Food allergy	Food intolerance
<ul style="list-style-type: none"> ⊙ It usually comes on suddenly. ⊙ Small amounts of food can trigger a reaction. ⊙ A reaction happens every time the food is eaten. ⊙ It can be life-threatening. 	<ul style="list-style-type: none"> ⊙ It usually comes on gradually. ⊙ A reaction may only happen when a lot of the food is eaten. ⊙ A reaction may only happen if the food is eaten often. ⊙ It is not life-threatening.



Symptoms of allergic reactions	Symptoms of food intolerance
<ul style="list-style-type: none"> ⊙ Rashes or hives ⊙ Itchy mouth ⊙ Swelling of face, tongue and lips ⊙ Trouble breathing 	<ul style="list-style-type: none"> ⊙ Gas ⊙ Stomach cramps/bloating ⊙ Heartburn ⊙ Headaches

Symptoms of both
<ul style="list-style-type: none"> ⊙ Nausea ⊙ Abdominal pain ⊙ Diarrhoea ⊙ Vomiting



Further information

Anaphylaxis

Anaphylaxis is a severe allergic reaction to certain foods and it can lead to death. A person who has an anaphylaxis reaction needs immediate emergency medical care.

Symptoms of anaphylaxis include:

- ⊙ Difficulty breathing
- ⊙ Rash on the skin
- ⊙ Rapid heart rate
- ⊙ Nausea

If someone has a severe reaction, they may go into a state known as anaphylactic shock. This is life-threatening and can cause death. You can save a person's life by using an injection of adrenaline that comes in the form of an auto-injector. An ambulance should also be called immediately. Most people with severe allergies carry an adrenaline auto-injector with them.



Example Question 22:

Which of the following is a characteristic of food intolerance?

- a) It is a digestive problem
- b) It is an immune response
- c) It is life-threatening
- d) It can lead to anaphylaxis

Example Question 23:

Which of the following is a sign/symptom of both an allergy and an intolerance?

- a) Vomiting
- b) Rashes and hives
- c) Headaches
- d) Trouble breathing

HSC.4.3.01.002 Outline the purpose of therapeutic diets

Therapeutic diets

The word therapeutic relates to the healing of disease.

The word diet relates to the foods and drinks that you regularly eat.

Therefore, a therapeutic diet refers to the use of diet or certain foods to treat and manage diseases.

A therapeutic diet is a special diet plan designed by a healthcare professional. It controls the intake of certain types of foods or nutrients based on the nutritional needs and health status of a patient. Therapeutic diets can be altered for nutrients, texture, food allergies or food intolerances.

Who benefits from therapeutic diets?

It is very important for people who have an illness or disease to have a healthy diet.

A therapeutic diet can benefit individuals with health conditions such as:

- ⊙ Cardiovascular disease
- ⊙ Obesity
- ⊙ Diabetes
- ⊙ Food allergies
- ⊙ Digestive diseases
- ⊙ Eating disorders

Therapeutic diets can play a very important role in the management of a disease. They can reduce the amount of medication that is needed, increase quality of life and even increase life expectancy. In some cases, a therapeutic diet can cure some conditions.

Why are therapeutic diets needed?

There are many reasons why a patient may be given a therapeutic diet. Some of the common reasons include the following.

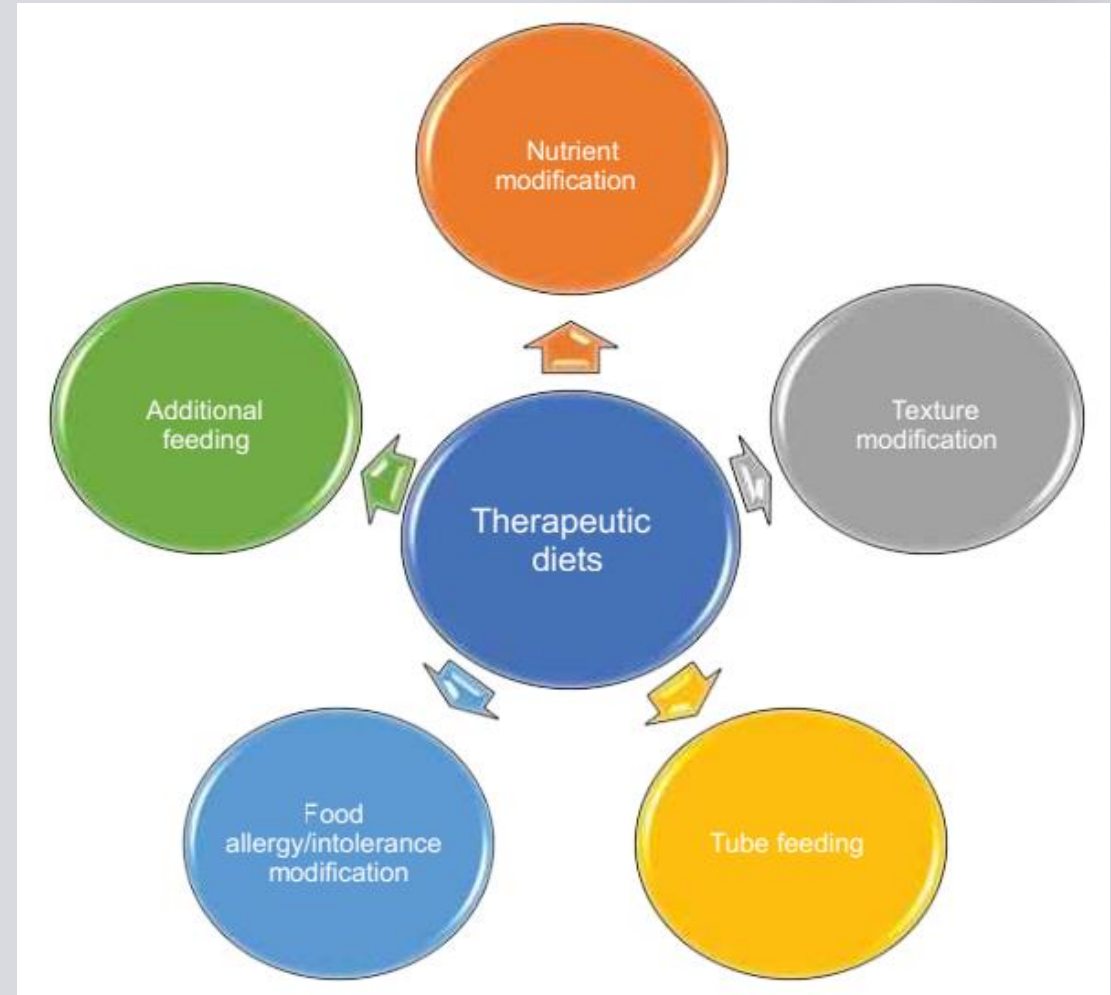
- ⊙ To increase, decrease or eliminate a type of food or nutrient, such as dairy or salt.
- ⊙ To maintain or improve nutritional status.
- ⊙ To provide extra calories for weight gain.
- ⊙ To balance the diet.
- ⊙ To remove certain foods that affect medication.
- ⊙ To help with digestion.
- ⊙ To remove foods due to allergies or intolerances.
- ⊙ To provide changes in texture due to problems with chewing or swallowing.

Nutrient modifications

This is where one or more nutrients are added or removed from the diet. Nutrient modifications are normally used to help fight diseases such as osteoporosis, hypertension or diabetes. Adding or removing nutrients can reduce the effects of a disease.

Common nutrient modified diets include:

- ⊙ Low sugar diet
- ⊙ Low sodium (salt) diet
- ⊙ Low-fat diet
- ⊙ High fibre diet
- ⊙ Renal diet (low sodium, potassium and phosphorous)

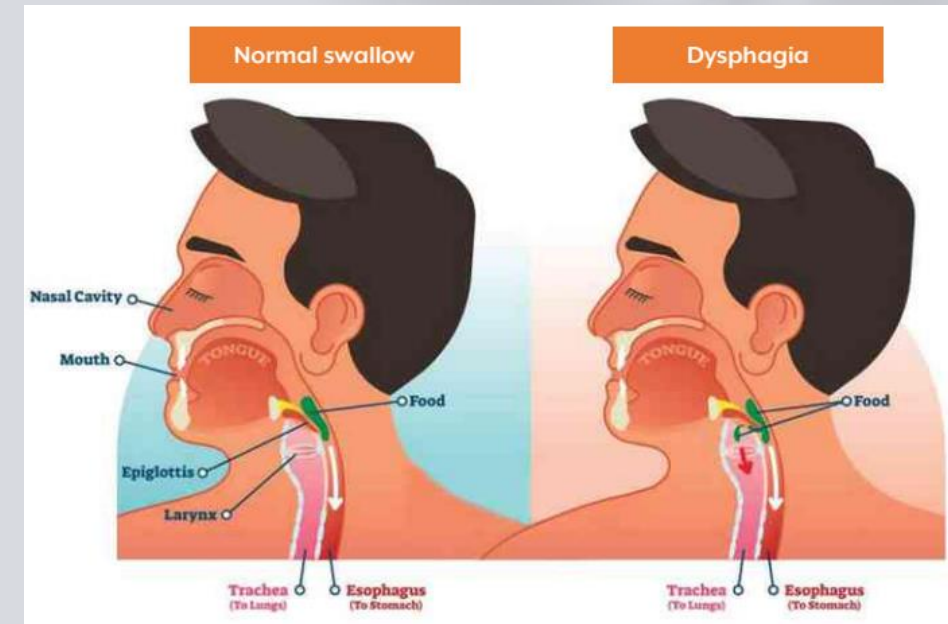


Texture modification

Swallowing is a complex function. When we eat food, it is chewed and moved around the mouth until it reaches an area at the back of the tongue. Here, the swallow reflex is triggered. For some people, the brain does not register when the food reaches this area. Some people do not have teeth to properly chew food. Eating and drinking can become a slow and difficult process, and choking is a hazard. The medical term used to describe when people have problems with swallowing food is dysphagia. The texture and consistency of food can be modified to make eating easier for these people.

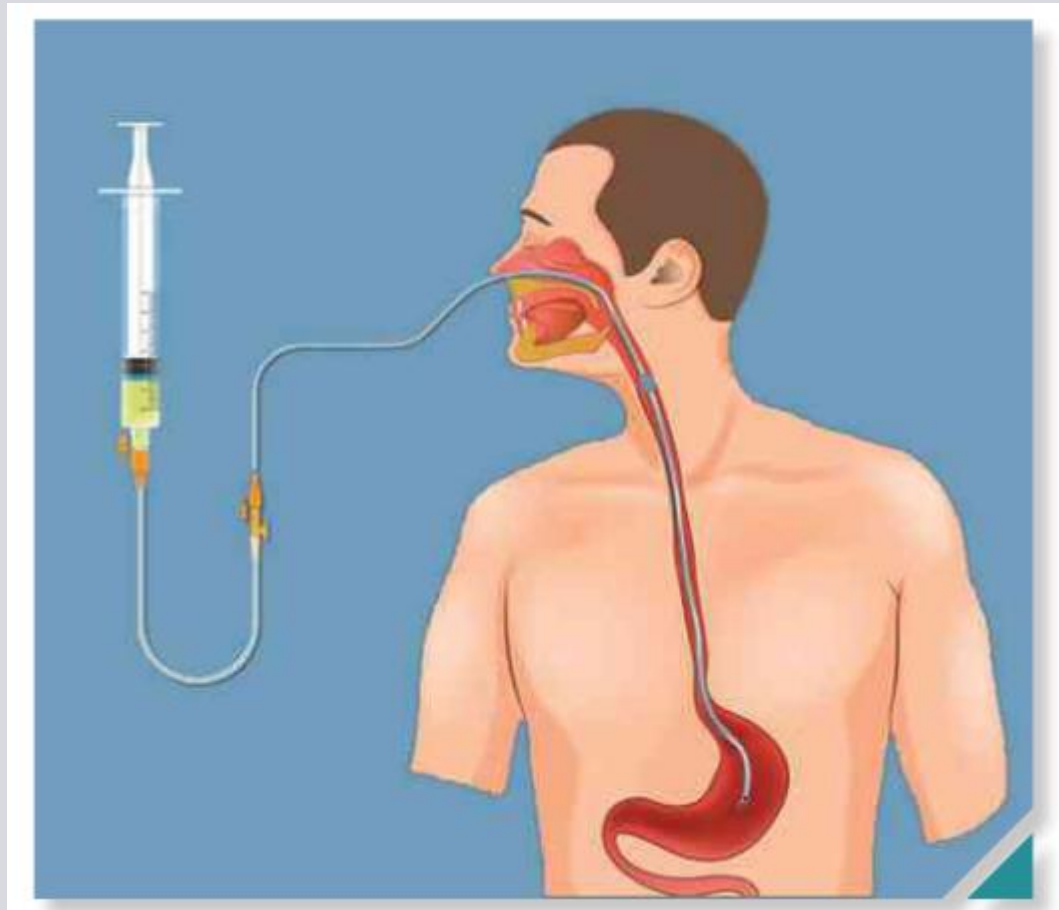
There are three main levels of texture modification of foods:

- ⦿ **Soft** – when food is cooked or cut so it can be easily chewed with minimal effort.
- ⦿ **Minced and moist** – food is soft, easily mashed with a fork; any lumps that are present are smooth.
- ⦿ **Puree diet** – food is smooth, moist and lump-free; Sometimes pureed food is grainy.



Tube feeding

People may need tube feeding because they cannot get enough nutrients on their own. This could be because they have problems with their mouths or have difficulty swallowing food. The nutrients they receive are similar to normal food and their bodies digest them in the same way. In some cases, tubes are inserted through the nose or mouth and go down the oesophagus into the stomach. In other cases, the tubes are inserted directly into the stomach.



Example Question 24:

Which type of therapeutic diet is given to a patient with dysphagia?

- a) nutrient modification
- b) texture modification
- c) intolerance modification
- d) allergy modification

HSC.4.3.01.001 Explain the dietary guidance for overweight individuals.

Overweight and obesity

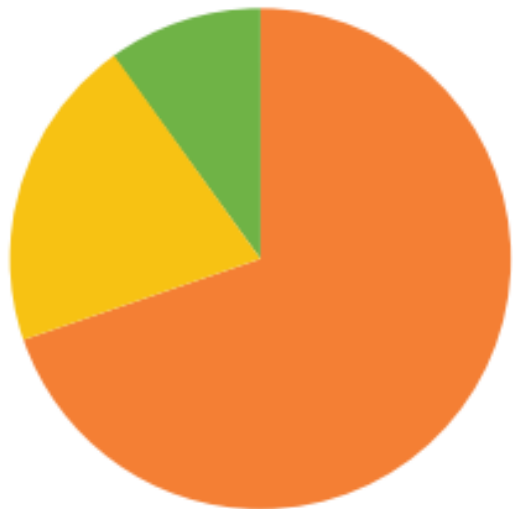
If a person is overweight or obese, it increases their risk of developing other diseases such as diabetes, heart disease and cancer.



Remember

A person who has a BMI between 25-29.9 is classed as overweight. A person with a BMI above 30 is classed as obese.

Energy output



■ BMR ■ Physical activity ■ Thermal effect of food

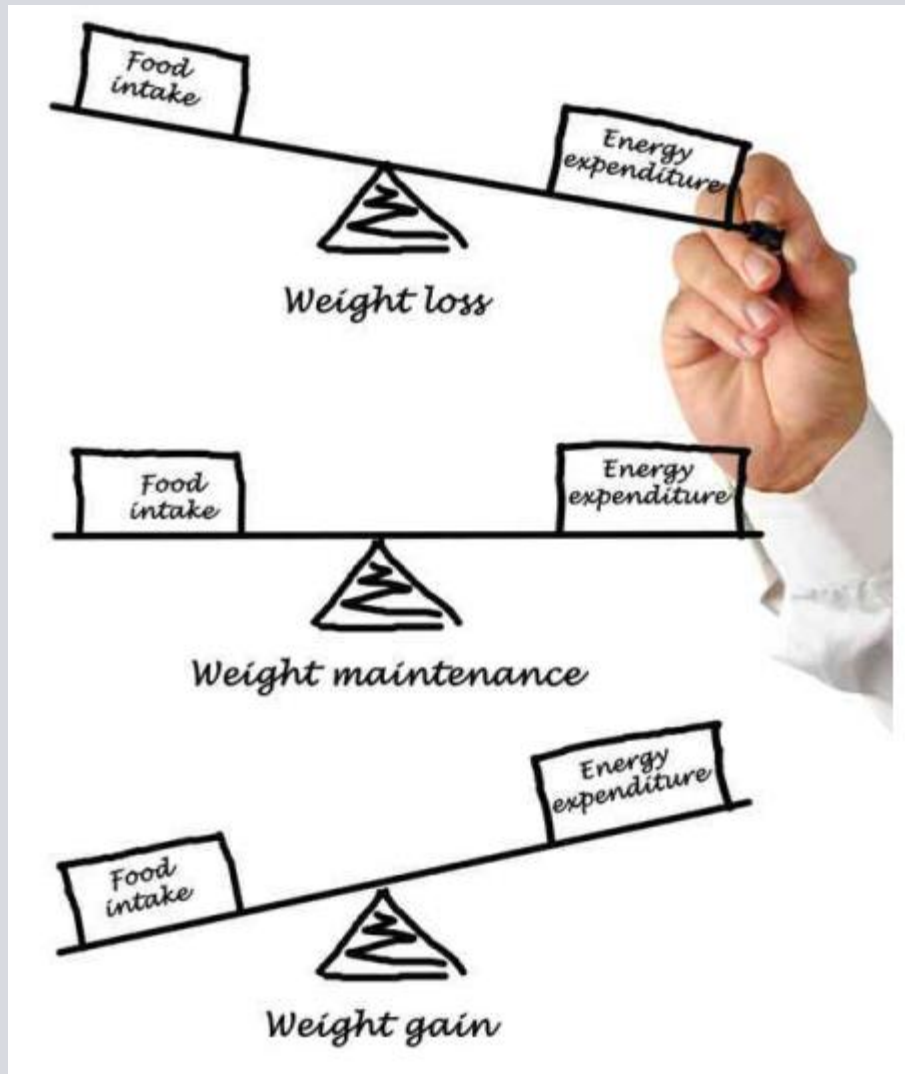
Energy balance

Energy balance is the balance of calories that are consumed through eating and drinking compared to calories burned throughout the day. You can calculate energy balance by using the energy balance equation:

$$\text{Energy balance} = \text{energy input} - \text{energy output}$$

As you have read above, energy input is the calories that come from foods and drinks that have been consumed. Energy output is made up of three different things:

- ⊙ Basal metabolic rate (BMR) – most of your energy is used up doing basic functions such as breathing and blood circulation. Even when you are sleeping your body is burning calories. The rate at which your body burns calories when it is at total rest is called your BMR. This is the number calories that your body needs to simply survive.
- ⊙ Physical activity – anything that raises your heart rate above resting is counted as physical activity. Daily activities are even classed as physical activity, such as walking upstairs.
- ⊙ Thermal effect of food – the energy that is used to chew, digest and store food. This uses the least amount of energy.



Diet for overweight

- ⦿ Eat a variety of foods each day.
- ⦿ Try to eat enough fruit and vegetables every day.
- ⦿ Choose food high in protein, lean meat, fish, eggs and legumes.
- ⦿ Make sure that the diet has enough cereals and their products.
- ⦿ Make sure that the diet contains enough calcium. Good sources include milk and dairy products.
- ⦿ Reduce intake of foods that are high in saturated fat.
- ⦿ Reduce the intake of food and drinks that have high sugar content.
- ⦿ Reduce processed foods.
- ⦿ Reduce the intake of sodium and foods that are high in salt.
- ⦿ Eat foods high in fibre; this will help with digestion and keep you feeling full for longer.
- ⦿ Consume enough water every day.

Example Question 25:

Someone who is overweight may be encouraged to increase their energy output. Which of the following is a part of energy output?

- a) basal metabolic rate (BMR)
- b) body mass index (BMI)
- c) food and drink intake
- d) all of the options are correct