

Health Science

End of term revision

G12 General

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Term 3

1	HSC.3.9.01.006 Demonstrate an understanding of the history of systems of medicine, medicines, and pharmacy.	Textbook	12-15
		PDF / Workbook	12-13

What is the definition of pharmacy?

Pharmacy is the clinical science that combines which three sciences?

What is 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.



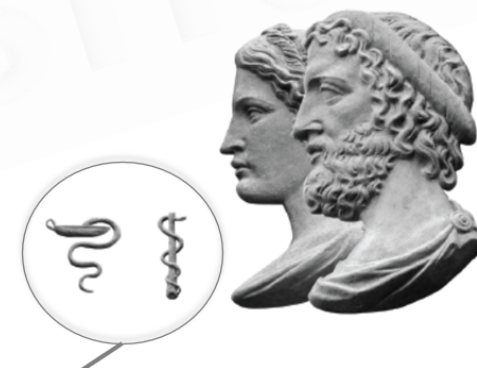
2	HSC.3.9.01.006 Demonstrate an understanding of the history of systems of medicine, medicines, and pharmacy.	Textbook	12-15
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What is pharmacy?

Pharmacy started existing a very long time ago as part of medicine. It started in ancient (old) Greece, Rome, Middle East, Egypt, India and China.

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.



	True	False
Pharmacy is the science of collecting, preparing and dispensing drugs.	☒	☐
Pharmacy is a very modern and new science. It didn't exist since a very long time ago.	☐	☒
Ancient (old) Greeks were the first ones to treat a person using a drug.	☒	☐
During the Islamic Golden Age, the separation between pharmacy and medicine happened.	☒	☐
Pharmacists are healthcare professionals specialised in preparing, using, storing and providing medicines.	☒	☐

3	HSC.3.9.01.008 Identify the evolving roles of the pharmacists in different disciplines.	Textbook	16
		PDF / Workbook	14
4	HSC.3.9.01.008 Identify the evolving roles of the pharmacists in different disciplines.	Textbook	16
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What are the four types of pharmacy you have studied in this unit?

Types of Pharmacy



Community pharmacist – pharmacists who work in a pharmacy where you would go to buy medicines.



Home care pharmacist – pharmacists who are responsible for preparing and sending medication to people who are home as they are very sick or old.



Clinical pharmacist – pharmacists who work in hospitals with doctors and nurses. They decide and advice which treatment each patient needs to



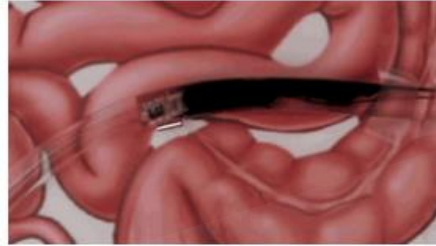
Research pharmacist – pharmacists who develop new drugs.

The first table below has four different types of pharmacy. Read the sentences in the second table and decide which one describes each type of pharmacy.

community	clinical	home care	research
These pharmacists develop new drugs.			research
These pharmacists work in a pharmacy where you would go to buy medicines.			community
These pharmacists work in hospitals with doctors and nurses.			clinical
These pharmacists are responsible for preparing and sending medication to people who are at home.			home care

5	HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients.	Textbook	18-22
		PDF / Workbook	16-19

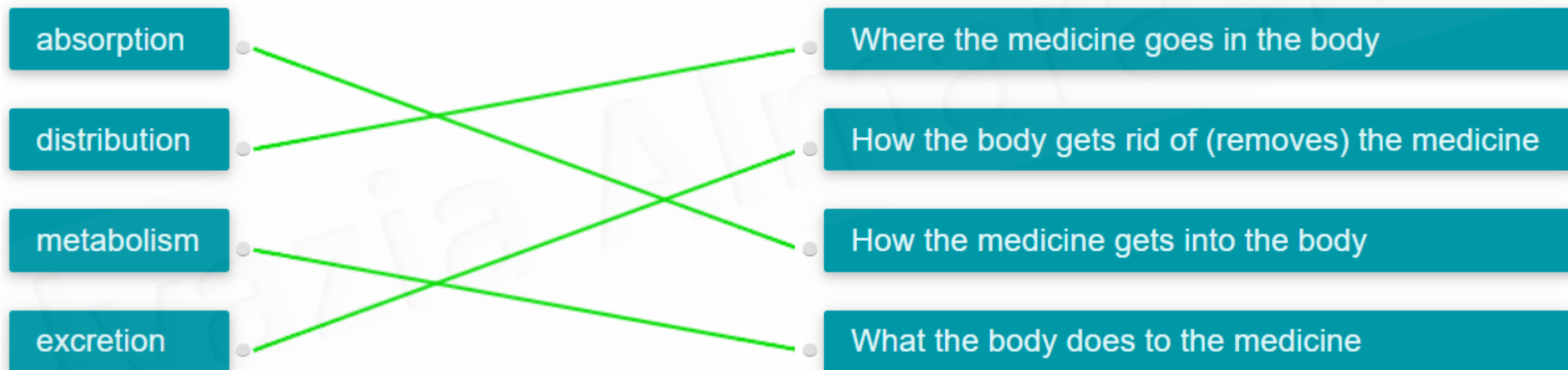
- **pharmacokinetics** – is the study of what the body does to the drug.



- **Pharmacodynamics** – is the study of what the drug does to the body.



6	HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients.	Textbook	18-22
		PDF / Workbook	16-19



7	HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients.	Textbook	18-22
		PDF / Workbook	16-19

	Pharmacokinetics	Pharmacodynamics
Metabolism is what the body does to a drug.	☐	☒
This is the study of what happens to drugs once they enter the body.	☒	☐
Patient age or pregnancy are factors that influence what the drug does to the body.	☐	☒
This is the study of the effect that drugs have on the body.	☐	☒

8	HSC.3.9.01.001 Define pharmacology, pharmacokinetics, and pharmacodynamics; and discriminate between drugs, medicines, and excipients.	Textbook	18-22
		PDF / Workbook	16-19

Drug, medicine and excipient

The words “drug” and “medicine” can be used to describe the same thing, however, in pharmacy those two words have different meanings



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



Medicines

- used directly as a treatment
- can treat a pain or cure an infection.
- result of a drug or drugs being mixed, sometimes with an excipient or without it



An excipient is a **substance, such as sugar or gum, used to prepare a drug so it is suitable to administer**. Excipients - additives used in forming tablets and capsules - bind the active ingredients together. The excipients used in these formulations should not interfere with the active ingredients.

Excipients

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

Sentences	True	False
Drugs are directly used as a treatment. For example, a drug can directly treat a pain or cure an infection.		False
An excipient helps formulating, protecting or supporting a medicine.	True	
Medicines are chemical substances that are taken from plants, animals, microorganisms or minerals.		False
Medicines can contain (have) an excipient or not.	True	
Drugs are considered ingredients to medicines.	True	
An excipient makes a medicine unsafe and harmful to use.		False
Medicines are directly used as a treatment.	True	

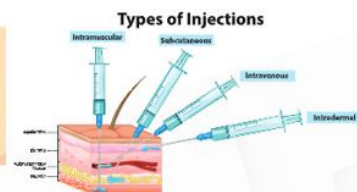
Routes Of Administration



oral

Sublingual
&
Buccal

Topical



Parenteral

Match the following routes of administration with the correct explanation.

Oral

Topical

Parenteral

When the area to be treated is easy to reach. For example, the skin.

When the patient takes medication through the mouth.

The use of injections.

10	HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.	Textbook	24-29
		PDF / Workbook	20-22

Oral administration

- The patient takes medication **through the mouth.**
- Generally, medication is consumed in a **form of pill or capsule.**
- 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



1. It is the easiest, safest and most cost-effective route
2. provide a very accurate dose for the patient.
3. There are “slow-release” forms available. This means that the drug releases slowly over a period of time, like twelve or twenty-four hours.

Disadvantages



1. 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.
2. 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.

10	HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.	Textbook	24-29
		PDF / Workbook	20-22

Advantages

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

Disadvantages

1. It can be uncomfortable for a patient to hold a small tablet in their mouth for a long time.
2. 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.
3. 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



Sublingual administration:

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



Buccal administration:

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

10	HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.	Textbook	24-29
		PDF / Workbook	20-22

Topical administration

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



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

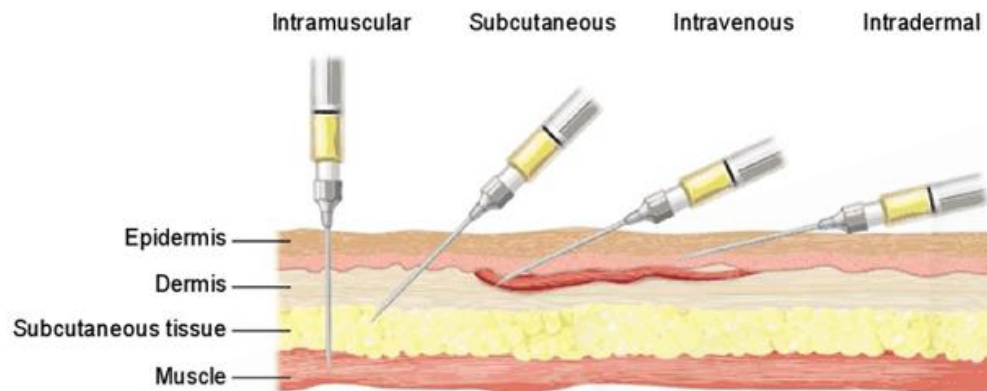
Disadvantages



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

11	HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.	Textbook	24-29
		PDF / Workbook	20-22

Parenteral administration



There four different types of injection, these are:

1. **Intradermal** – the drug is injected **into layers of skin** e.g. vaccinations
2. **Intravenous** – the drug is injected into the bloodstream through a **vein** e.g. morphine
3. **Subcutaneous** – the drug is injected into the **fat layer under the skin** e.g. insulin
4. **Intramuscular** – the drug is injected into the **muscle** e.g. paracetamol

Advantages



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

Disadvantages

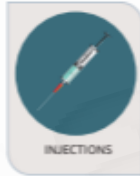
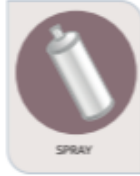
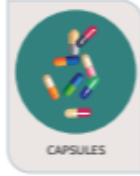


1. They require aseptic (disease-free) conditions and preparation should be sterile.
2. The equipment is expensive.
3. The technique can be uncomfortable or painful for the patient.
4. Most injections cannot be self-administered as they require a trained medical professional.
5. They can be dangerous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

12	HSC.3.9.01.002 Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.	Textbook	24-29
		PDF / Workbook	20-22

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

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

Form of medication	Route of administration
 OINTMENTS, CREAMS, GELS	Topical administration
 INJECTIONS	Parenteral administration
 TABLETS, PILLS	Oral administration Sublingual administration: Buccal administration:
 SPRAY	Sublingual administration: Buccal administration: Topical administration
 CAPSULES	Oral administration
 INFUSION	Parenteral administration

14	HSC.3.9.01.002 Identify the appropriate use of antibiotics.	Textbook	30-33
		PDF / Workbook	24-27

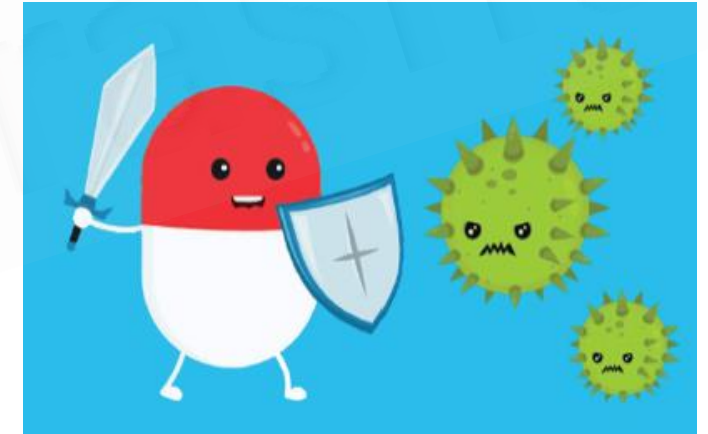
What is an antibiotic?

Can antibiotics cure (treat) COVID-19 infection?

Yes, it can cure it.

No, it cannot cure it.

- Antibiotics are medicines that destroy or slow down the growth of bacteria.
- They include a range of strong drugs that treat diseases caused by bacteria.
- Normally when bacteria multiply in the body, the immune system can kill them and fight the infection.
- Sometimes the body's immune system cannot fight them by itself, and this is when antibiotics are used.
- When antibiotics are used properly, they can cure infections and they can save lives.



NOTE: Antibiotics cannot fight viral infections, like the common cold or COVID-19!

15	HSC.3.9.01.002 Identify the appropriate use of antibiotics.	Textbook	30-33
		PDF / Workbook	24-27
16	HSC.3.9.01.002 Identify the appropriate use of antibiotics.	Textbook	30-33
		PDF / Workbook	24-27

What is antibiotic resistance and why does it happen?

antibiotics can become useless against the bacteria as the bacteria have improved their defenses.

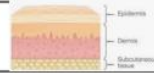
Read the following scenarios and decide if you think the person requires a prescribed antibiotic or not.

Scenario	Is an antibiotic needed?	Why?
Mahra has a virus which has given her a chest infection.	no	The cause is virus
Sultan has a bacterial infection in his eye that spreads easily from person to person.	yes	The cause is bacteria

Infection	Yes	No
Tuberculosis	★	
COVID-19		★
Chickenpox	★	
Tonsillitis	★	
Cholera	★	
The flu		★

17	HSC.3.9.01.007 Interpret basic Latin prescription abbreviations.	Textbook	34-39
		PDF / Workbook	28-33

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

Routes of administration	
Abbreviation	Meaning
IM	 Intramuscular
IV	Intravenous 
PO	 By mouth
SC	Subcutaneous 
SL	 Sublingual
TOP	Topical 

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

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

18	HSC.3.9.01.007 Interpret basic Latin prescription abbreviations.	Textbook	34-39
		PDF / Workbook	28-33

Sentence	True	False
Abbreviations are not used in healthcare.		False
Abbreviations are only used by doctors.		False
Healthcare professionals use abbreviations when writing and communicating.	True	
Not interpreting abbreviations correctly can be dangerous for patients.	True	
Interpreting abbreviations correctly is very important as it guarantees patients' safety.	True	

Imagine you are a pharmacist or a nurse, you are going to read now the medical records of a patient who was admitted to hospital yesterday. After you finish reading the medical record, answer the questions on the next page.

♂ 72 y.o. admitted to A&E due to SOB, F/C/S, cough

Tests: Chest XR, FBC, MCS, ABG,
Sputum sample.

Dx: pneumonia

Tx: antibiotic therapy, antipyretic

Rx:

1. Augmentin 1.2g, IV, qid, pneumonia
2. Clindamycin 300mg, PO, tid, ac, 7 days, pneumonia
3. Paracetamol 1g, IV, tid, fever

BP 132/77
T 39.5
O2 82%
HR 132
RR 31

1. What is the diagnosis of the patient?

Dx: pneumonia

2. What type of X-Ray did the patient have?

: Chest XR,

3. What are the names of the three medicines the patient has been prescribed?

Rx:

1. Augmentin 1.2g, IV, qid, pneumonia
2. Clindamycin 300mg, PO, tid, ac, 7 days, pneumonia
3. Paracetamol 1g, IV, tid, fever

4. What is the indicated route of administration of Augmentin 1.2g and Clindamycin 300mg?

PO, By mouth

5. How many times is Paracetamol 1g prescribed?

tid, Three times

6. How many times is Augmentin 1.2g prescribed?

qid, Four times

7. When should the patient take Clindamycin 300mg? Before, with or after food?

, ac, Before Food

19	HSC.3.9.01.004 Demonstrate competence in a broad range of basic, scientific, and pharmaceutical calculations.	Textbook	40-44
		PDF / Workbook	34-37

Tablet dosage

الى طالبه الدكتور
Prescribed dose ÷ stock strength = number of tablets needed

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

15g to mg 15000	3kg to g 3000
7L to ml 7000	8L to ml 8000
2 hours to min 120	4 min to sec 240

Scenario 1

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?

Desired dose	Equation	Stock strength	Equals	No. of tablets
40	÷	5	=	8

Scenario 2

The doctor has prescribed 400mg of Ibuprofen three times a day for a patient. The tablets come in 200mg tablets. How many tablets need to be dispensed per day?

Desired dose	Equation	Stock strength	Equals	No. of tablets
400	÷	200	=	2

Tablets per day = $2 \times 3 = 6$

Scenario 3

There is 250mg of penicillin in one tablet. The doctor wants the patient to take 500mg twice daily. How many tablets should the patient take in the morning?

Desired dose	Equation	Stock strength	Equals	No. of tablets
$500 \div 2 = 250$	÷	250	=	1

19	HSC.3.9.01.004 Demonstrate competence in a broad range of basic, scientific, and pharmaceutical calculations.	Textbook	40-44
		PDF / Workbook	34-37

Mixtures and solution

الى طالبه الدكتور
الى موجود في الصيدلية
Desired dose ÷ stock strength x stock volume = amount of solution

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

Scenario 1

A child has a temperature of 39.0°C. The doctor has ordered a 500mg paracetamol suspension, four times a day. Paracetamol suspension comes in 250mg/5ml. How much paracetamol suspension needs to be dispensed per day?

Desired dosage	Equation	Stock strength	Equation	Stock volume (ml)	Equals	Amount of solution required (ml)
500	÷	250	X	5	=	10

Total per day = $10 \times 4 = 40$ ml

الى مطلوب اهنه لليوم كامل كم حبه

Scenario 2

The doctor has ordered a 250mg paracetamol suspension, two times a day. Paracetamol suspension comes in 250mg/5ml. How much paracetamol suspension needs to be dispensed per day?

Desired dosage	Equation	Stock strength	Equation	Stock volume (ml)	Equals	Amount of solution required (ml)
250	÷	250	X	5	=	5

Total per day = $5 \times 2 = 10$ ml

الى مطلوب
اهنه للمره
الوحده في
اليوم

20	HSC.3.9.01.004 Demonstrate competence in a broad range of basic, scientific, and pharmaceutical calculations.	Textbook	40-44
		PDF / Workbook	34-37

Calculate IV rate

Total IV volume ÷ time (hours or minutes) = ml administered per hour or minute

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

Scenario 1

The doctor has prescribed 300ml of normal saline solution over six hours. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
300	÷	6	=	50 ml / 1h

Scenario 2

A patient needs to be given two litres of saline over 16 hours. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
2 L X 1000 = 2000 ml	÷	16	=	125 ml

Scenario 3

A patient needs to be given 50ml of saline over 90 minutes. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
50	÷	90 ÷ 60= 1.5	=	33.3 ml

21	HSC.3.9.01.009 Demonstrate an understanding of essential communication skills applied to pharmacy.	Textbook	46-50
		PDF / Workbook	38-40

Safe administration and storage of medication are very important. What might happen if medications are not administered or stored (kept) correctly?

- **If safety measures are not followed, there is a chance there will be a medication error:**
 - Patient could take the medication at the wrong time
 - Or take the wrong dose
 - Effects of these errors can range from minor to fatal

22	HSC.3.9.01.009 Demonstrate an understanding of essential communication skills applied to pharmacy.	Textbook	46-50
		PDF / Workbook	38-40

Explain how effective communication can improve safety in pharmacy.

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?

22	HSC.3.9.01.009 Demonstrate an understanding of essential communication skills applied to pharmacy.	Textbook	46-50
		PDF / Workbook	38-40

What are “the six rights of drug administration”?

Six rights of drug administration

1. **Right drug:** have the correct drug
2. **Right patient:** given to the right patient
3. **Right dosage:** give the correct amount of dose to the patient
4. **Right route of administration:** get the correct route as sometimes patient got confused
5. **Right time:** taken at the right time example before or after meals or by hours such as every 6 hours
6. **Right documentation:** recording and double checking when, what and side effect.

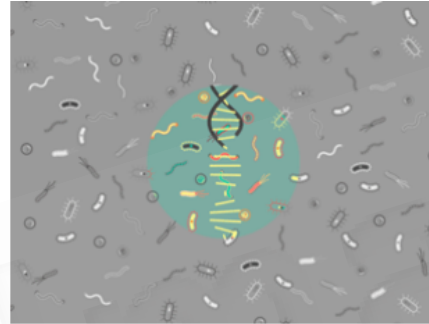
23	HS.4.2.01.001 List the causes of foodborne illness.	Textbook	56-63
		PDF / Workbook	50-57

What are foodborne illnesses?

- known as food poisoning, are caused by eating food that are contaminated.

- Most common** disease-causing microorganisms found in food are **bacteria**

- Can also include viruses, fungi, parasites, or chemicals



For every ten people who eat contaminated food, one person will become ill.

Foodborne illness can cause death, particularly in young children and older adults.

Fill in the blanks

Read the following paragraph about foodborne illnesses. Fill in the blanks with the correct answers.

Foodborne illnesses normally last a for time. They happen from to hours after eating food that is contaminated. Most people recover treatment.

Signs and symptoms are different depending on the cause and type of infection.

They may cause:

- Nausea
- Vomiting
- Abdominal cramps
- Diarrhoea

Usually, they happen suddenly and last a short time. They can occur from 6-72 hours after eating **contaminated** food.

24	HS.4.2.01.001 List the causes of foodborne illness.	Textbook	56-63
		PDF / Workbook	50-57

Name of food	Why it is high risk
Poultry	avoid washing raw chicken as this will spread the bacteria around the kitchen.
Eggs	Bacteria can live in the yolk, the white part of the egg and the eggshell
Seafood	Fish can become contaminated through sewage in the water where they live.

25	HS.4.2.01.002 Explore the concept of cross-contamination.	Textbook	64-67
		PDF / Workbook	58-61

Food-to-food

- process of adding contaminated food to non-contaminated food
- Harmful **bacteria** spread and multiply
- **Raw, undercooked or unclean food** can contain large amounts of bacteria
- Example – adding unwashed, contaminated lettuce to a fresh salad can contaminate the other ingredients

Equipment-to-food

Bacteria can live for a long time on surfaces like:

- Countertops
- cutting boards
- utensils
- storage containers
- factory equipment

It is very important to wash all surfaces and equipment properly using soap and hot water



People-to-food

- It is easy for humans to transfer bacteria from their bodies or clothes to food
- This includes using dirty tea towels
- A person could cough into their hand and continue to prepare a meal without washing their hands

25	HS.4.2.01.002 Explore the concept of cross-contamination.	Textbook	64-67
		PDF / Workbook	58-61

Read the following scenarios and decide which type of cross-contamination is being described.

Huda made dinner for the family. When she finished, she rinsed the utensils in cold water and left them to dry. The next day Huda's mother used the same utensils to prepare breakfast. During the day, the whole family became unwell.

Equipment-to-food

Mohammed works in a fast-food restaurant. He emptied the bins in the restaurant and did not wash his hands. Then he prepared some burgers. Customers reported feeling sick a few days after this happened.

People-to-food

Hind used a brown chopping board to prepare some sushi for her friends. Hind and her friends thought the sushi was delicious, but they could not understand why everyone was sick the next day.

Equipment-to-food + Food-to-food

Saeed made a chicken shawarma for dinner. He did not realise that the chicken he made was not fully cooked. It made him so unwell that he had to go to the hospital for a few days.

Food-to-food

List the points that contamination by bacteria can happen.

1. Keep clean

Why it is important

- It takes over 2.5 billion bacteria to make 250ml of water look cloudy
- In some cases, it only takes 20 harmful bacteria to make a person sick

Example

- Handwashing
- Cleaning plates and kitchen equipment
- Protect food from pests



2. Separate raw and cooked food

Why it is important

- Can transmit bacteria

Example

- While shopping, keep raw meat, poultry and seafood separate from other foods
- In the fridge, store raw meat seafood and poultry on shelves or sections below cooked foods
- Store food in containers with lids to stop raw and cooked foods from touching
- Wash plates that have been in contact with raw foods, and always use a clean plate for cooked foods

List the points that contamination by bacteria can happen.

	Why it is important	Example
3. Cook thoroughly	kill almost all dangerous bacteria	- Cooking food to 70 degrees <u>celcius</u> can ensure it is safe to eat - Cook meat and poultry until the juices are clear and the inside is not pink - Cook eggs and seafood until piping hot the whole way through - Boil liquid-based foods like soups and stews. Allow them to remain boiling for at least one minute



List the points that contamination by bacteria can happen.



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4. Keep food at safe temperatures

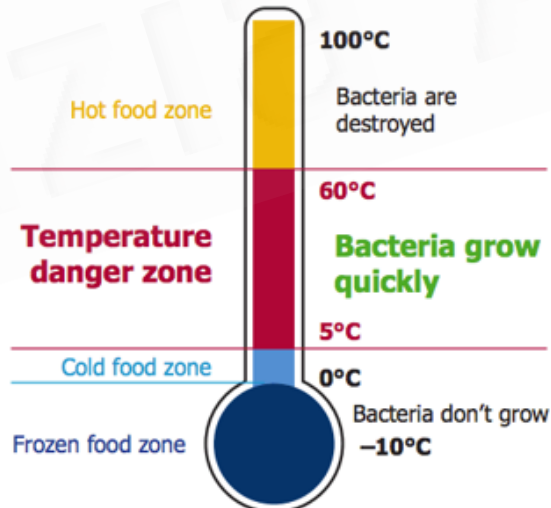
Why it is important

- The danger zone is the temperature range between 5-60 degrees Celsius
- This is where bacteria multiply very quickly
- Bacteria cannot grow if it is too hot or too cold

Example

- Cool food and store all leftover food quickly. Slice larger pieces of meat into smaller pieces and place food in a clean, cool container
- Leftover food should not be stored in the fridge for more than three days and should not be reheated more than once
- Thaw frozen food in the fridge

- The temperature danger zone is between 5°C and 60°C, when it is easiest for harmful bacteria to grow in food
- Minimise the time that food spends at these temperatures in order to keep food safe
- Refrigerated food needs to be kept at 5°C or below
- Hot food needs to be kept at 60°C or above



List the points that contamination by bacteria can happen.

	Why it is important	Example
5. Use safe water and raw materials	• water is free from dangerous bacteria and chemicals that could cause illness	• Wash and peel fruits and vegetables to reduce the risk of eating dangerous bacteria

Safe water is needed to:

- Wash fruit and vegetables
- Add to food and drinks
- Make ice
- Clean cooking equipment
- Wash hands

Selecting safe raw materials:

- Select fresh foods
- Avoid rotten food
- Choose dairy products that have been pasteurised
- If you are buying ready-to-eat cooked foods, make sure they are stored correctly (not in danger zone)



Match each of the five keys to safer food with their correct description.

Keep clean.	Store food in containers to avoid contact between raw and cooked foods.
Separate raw and cooked food.	Use clean water to cook and clean with.
Cook thoroughly.	Allow food to defrost in the fridge.
Keep food at safe temperatures.	Wash your hands before handling food and during preparation.
Use safe water and raw materials.	For meat and poultry, make sure the juices are clear and not pink.

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graph LR; K1[Keep clean.] --- D1[Wash your hands before handling food and during preparation.]; K2[Separate raw and cooked food.] --- D2[Store food in containers to avoid contact between raw and cooked foods.]; K3[Cook thoroughly.] --- D3[Use clean water to cook and clean with.]; K4[Keep food at safe temperatures.] --- D4[Allow food to defrost in the fridge.]; K5[Use safe water and raw materials.] --- D5[For meat and poultry, make sure the juices are clear and not pink.]
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I wish for you a
happy endings.

