

9.1 History of pharmacy

STARTER

Word search

Can you find the pharmacy keywords listed in the table below?

C X R C D R A T E F L T N
 U B R G T I U U H G W I F
 P I E N J V S X C O R S A P
 H W E S L G P P M J O P C A
 A T H Z Z A E T E X W L Q Y
 R Y I B C F D R V N V S Q B
 M A S H H K V J P S S I C U
 A N T E P H A R M A C I S I
 C Y O P J W D Y L S X X N P
 Y U R H F V J M U H R I V G
 H M Y E T Z H L O R V C E O
 S P U R Q T O N W O B Z X V
 K W U B P J M B O T A N Y G
 K Y U S X P V L C D P J X S
 I T V U K F C Y B M G I Y V

PHARMACIST	DISPENSING	BOTANY
PHARMACY	HERBS	HISTORY



Discussion: Pharmacy

Discuss what you already know about pharmacy. What you think it means?
Do you know what a pharmacist does?

pharmacy is science that study every
thing about drug and medicines, pharmacist
job is to give medicines for patients



Activity 1

Pharmacy



Answer the following questions regarding pharmacy.

1. What is pharmacy?

science of collecting, preparing, dispensing drugs.

2. What was pharmacy part of in the past?

in egypt, india and china physicians started
treat using plants.

3. What are herbs? Explain what they were used for in the past?

plant used to make medicines

4. How did the separation of pharmacy happen in the past?

muslim's scientists had a lot of knowledge
in chemistry and botany and wrote a lot of books

9.1 History of pharmacy



Research: Muslim scientists in the Islamic Golden Age

Research the work of Muslim scientists that contributed into the development of pharmacy.

Ali Ibn Abbas (925, 994) was considered one of the greatest doctors of the 10th century. He wrote many books which were not only in the Islamic world but also in Europe.



Activity 2

Types of pharmacy

Read the following descriptions of types of pharmacy and decide which type of pharmacy it describes.

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

9.2 Pharmacology

STARTER keywords

Write sentences or examples using the following two keywords.

1. Pharmacy

pharmacy is science of collecting drugs

2. Pharmacist

pharmacist is the medical professional who treat patients



Activity 3

What is pharmacology

In the space below, explain what pharmacology is.

the study of drugs

What is the prefix in the word pharmacology? What does it mean?

pharma → drugs

What is the suffix in the word pharmacology? What does it mean?

logy → study of



There are four stages of pharmacokinetics. In the spaces below, write the name of each stage and explain what it means.

Stage of pharmacokinetics	Definition
Absorption	How the medicine gets into the body
distribution	where the medicine goes
metabolism	what the body do to the medicine
excretion	how the body remove medicine



Explain the meaning of pharmacodynamics.

the study of what drug do to the body

What factors affect the pharmacodynamics of a drug?

1) age

2) other drugs

3) pregnancy

4) Disease type



Activity 6

Pharmacokinetics or pharmacodynamics

Look at the statements in the table below. Decide whether they are describing pharmacokinetics or pharmacodynamics.

Statement	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.	✓	
Certain receptors are activated depending on the drug.		✓
This is the study of the effect that drugs have on the body.		✓



Activity 7

Response levels

Fill in the blanks below to identify the name of the response or explain the meaning of the response when a drug connects to a receptor.

1. partial agonist - When a drug connects to a receptor and produces less than a maximum effect.

2. Antagonist - When a drug connects to a receptor but there is no effect.

3. Full agonist when a drug connects to a receptor and produces a maximum effect

**Activity 8****Drug, medicine or excipient**

Look at the sentences in the table below. Which one does the sentence describe best, a drug, a medicine or an excipient?

Sentence	Drug	medicine	excipient
Can be directly used as a treatment.		✓	
Helps formulate, protect and support a medicine.			✓
Can directly treat a pain or cure an infection.		✓	
Chemical substances that are taken from plants, animals, microorganisms or minerals.	✓		
Most medicines contain them in order to be safer for us to use.			✓
Are considered ingredients and are not used directly as a treatment.	✓		
Are the result of a drug or drugs being mixed.		✓	

9.3 Classes of drugs

STARTER

Keyword matching

Match the keyword to the correct description.

Chemical

Prescription

Inflammation

Symptoms

A condition where part of the body becomes red, swollen and painful.

Relating to chemistry; any substance consisting of matter.

A change in the body that indicates a disease is present.

A written message from a doctor that officially tells someone to use medicine.



Activity 9

Naming drugs

Describe the three different types of names which most drugs have.

1. chemical name

2. General name

3. brand name



Research: Generic names and brand names

Research the generic names of four drugs and find at least one brand name for each of the four drugs you have listed.

	Generic name	Brand name
1.	alprozalam	xanax
2	altretamine	lt exalen
3	amiodarone	cordarone
4	amitriptyline	Elavil



Activity 10

What is the question?

Read the following answers and decide what you think the question should be for each one.

Answer: They work by interfering with the nerve pathway and change the way that you feel pain.

Question: pain killers

Answer: Never take more than one type of these at the same time. → cause ulcers

Question: NSAID

Answer: Most of these can be bought over the counter, but you will need a prescription for some types.

Question: anti histamine

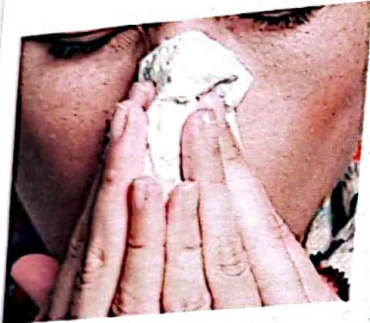
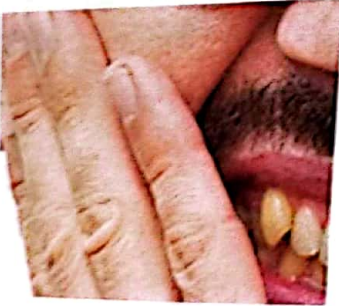
9.3 Classes of drugs



Activity 11

Drug groups

Read the following scenarios. Suggest which drug would be the most suitable for each person.

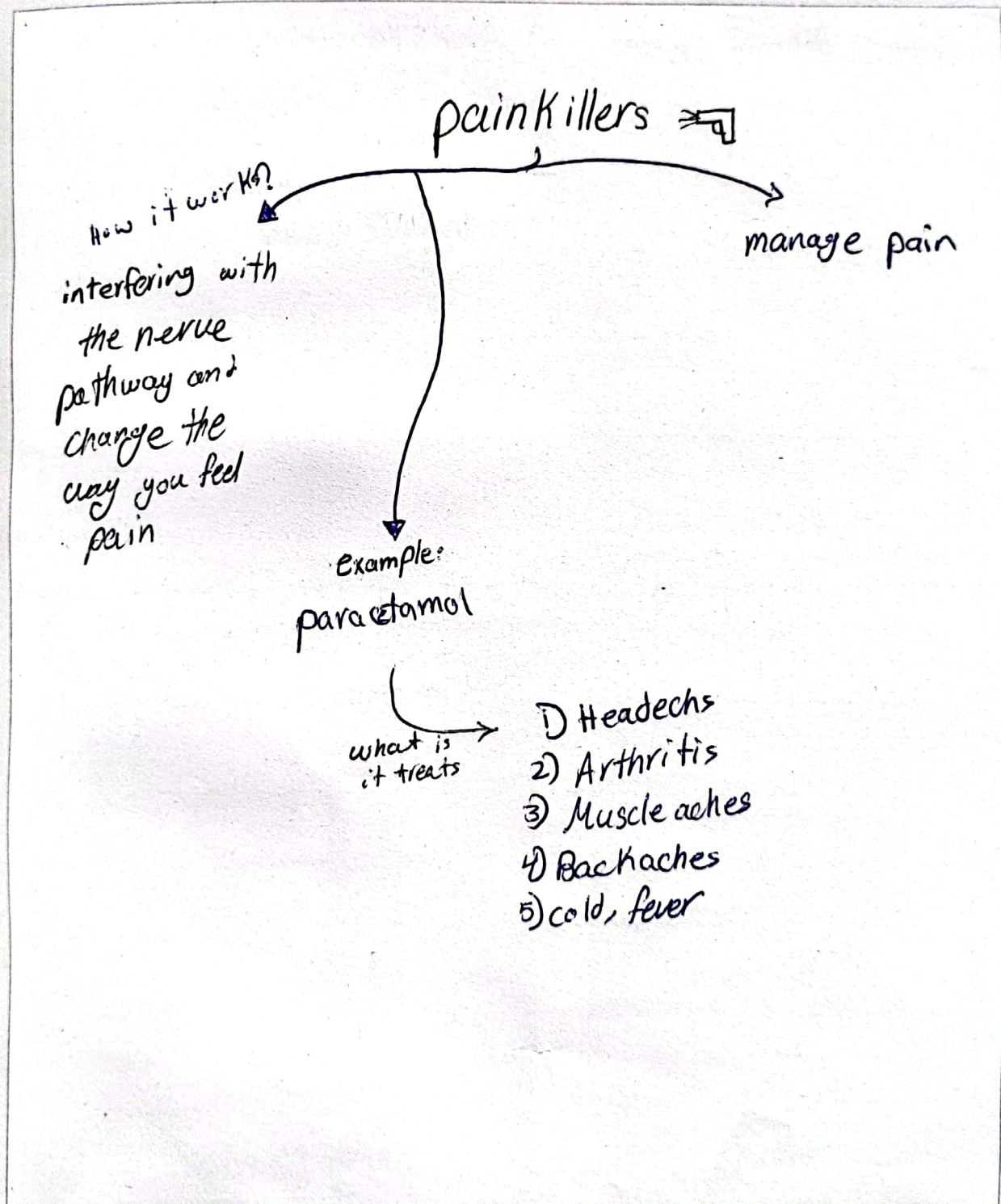
Scenario	Suggested drug
 Nouf went to her cousin's house to see their puppy. She now has swollen red eyes and is sneezing a lot. She thinks she has a dog allergy.	<i>anti histamine</i>
 Mohammed has a toothache. His mouth is red and swollen around the area of the toothache.	<i>ANALGESIC</i>
 Asmaa has fallen and hurt her wrist. She is in a lot of pain. There is no sign of fever.	<i>Pain killers</i>



Activity 12

Poster

Choose a drug group. Create a poster in the space below about this group. Include how it works in the body, what it is used to treat, and give an example of a drug in your chosen group.



9.4 Routes of administration

STARTER Classes of drugs

Think back to the last lesson where you learned about classes of drugs. Can you remember the three drug groups you studied? Can you explain the difference between these three groups?

generic name, brand name, chemical name

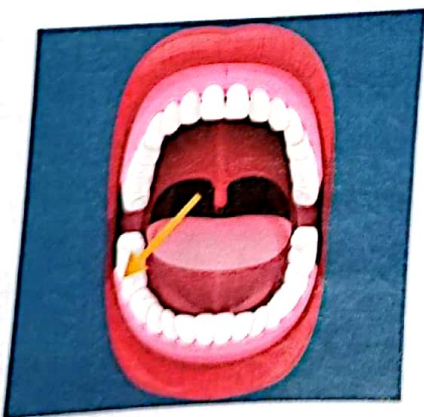
1) Pain killers	→ manage pain
2) NSAID	→ reduce aches cause by inflammation
3) Antihistamine	→ block and stop substance called histamine



Activity 15

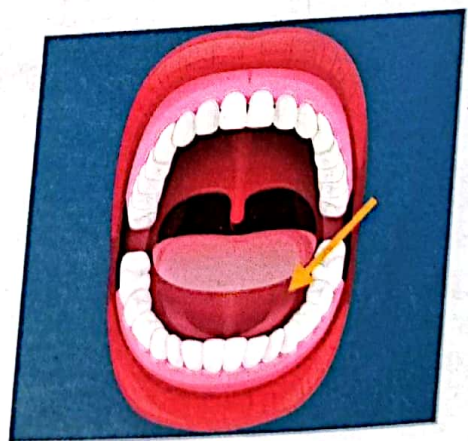
Sublingual and buccal

Look at the images and descriptions below. Identify if the route being described is sublingual or buccal. Write your answer in the boxes below the description.



The drug is placed between your gums and cheek.

buccal



The drug is placed under the tongue.

sublingual



Activity 14

Routes of administration

Decide on the appropriate route of administration for each of the following forms of medication.

Form of medication	Route of administration
 OINTMENTS, CREAMS, GELS	topical
 INJECTIONS	parenteral
 TABLETS, PILLS	oral
 SPRAY	Topical
 CAPSULES	oral
 DROPS	Topical

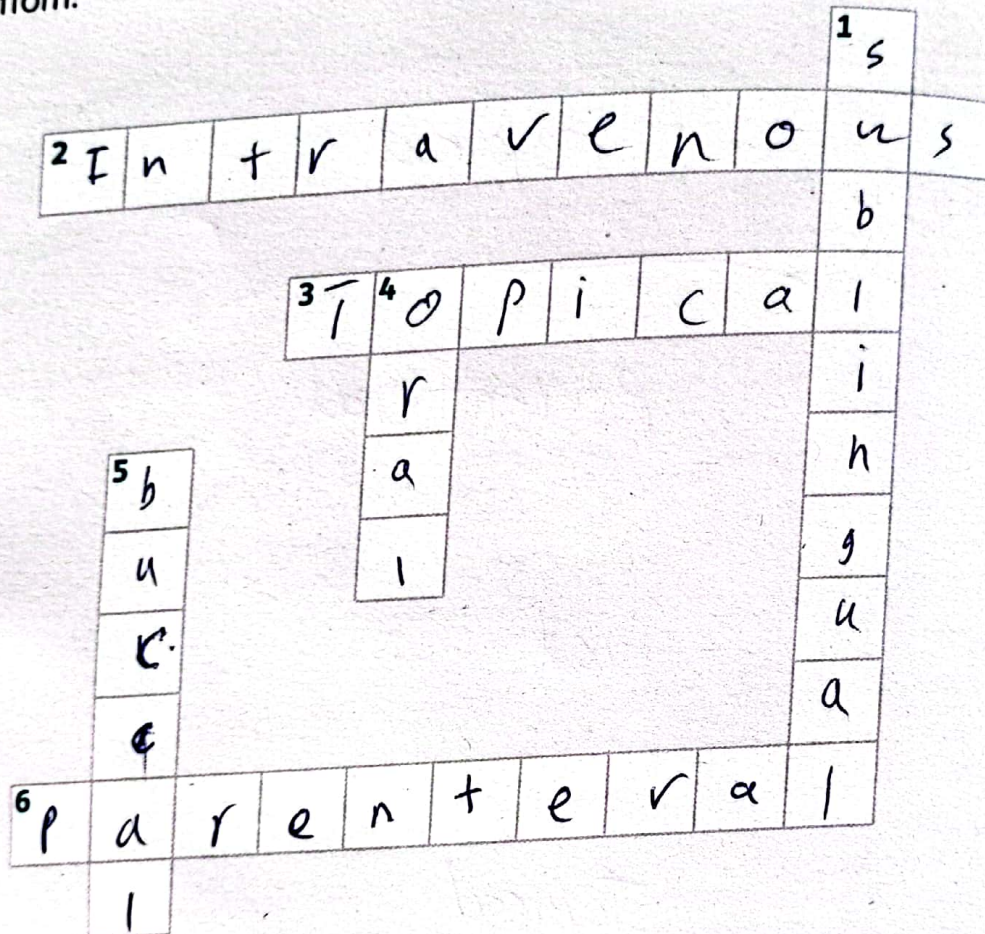
9.4 Routes of administration



Activity 15

Crossword

Complete the crossword below about routes of administration using the clues at the bottom.



Clues:

Across

- An injection into the bloodstream through a vein
- Areas treated using this form of medication include the eyes, skin and ears.
- The route of administration that uses injections

Down

- The drug is placed under the tongue.
- When the patient takes medication through the mouth
- The drug is placed between the gum and cheek



Activity 16

Advantages and disadvantages

Choose three routes of drug administration. Write one advantage and one disadvantage of each.

Route 1 oral

Advantage

- 1) easy
- 2) slow release
- 3) stable (you can give accurate dose)

Disadvantage

- 1) slow absorption
- 2) problem if there was any food in the digestive system

Route 2 sublingual and buccal

Advantage

- 1) good Alternative if the patient have swallowing problem or side effect from oral
- 2) small dose make effect

Disadvantage

- 1) if the patient swallow it accidentally
- 2) uncomfortable
- 3) if the patient eat or drink while the tube in their mouth

Route 3 topical

Advantage

- 1) good for specific area
- 2) easy for all ages
- 3) low side effects

Disadvantage

- 1) slow
- 2) Not well absorbed into deeper layers of the skin
- 3) uncomfortable for wear clothes

9.5 Antibiotics



Discussion: Antibiotics

What do you know about antibiotics? Have you ever taken them before? What was the name of the antibiotic you took? What route of administration was used? How long did you have to take the antibiotic for? Discuss and make notes below.

antibiotics are medicines that stops the growth of bacteria



Activity 17

Infections

Which infections below can be treated using antibiotics? Tick yes or no for your answer.

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



Activity 18

Antibiotic resistance

Answer the following questions about antibiotic resistance.

What is antibiotic resistance?

when the overuse of antibiotic did not
effect bacteria

What causes antibiotic resistance?

overuse of antibiotic
don't take all the antibiotic that you have
been prescribed by the doctor

How can the risk of antibiotic resistance be reduced?

take all the antibiotic that you have been
prescribed by the doctor

Do you believe antibiotic resistance is a problem in the world today?

yes

What does it mean to "complete the course" of antibiotics?

take all the antibiotics that you
have been prescribed by the doctor

9.5 Antibiotics



Activity 19

Prescribing antibiotics

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

Scenario	Is an antibiotic needed?	Why?
Mahmoud has a virus which has given him a chest infection.	no	because antibiotic did not treat viruses
Sheikha has a bacterial infection in her eye that spreads easily.	yes	because antibiotic treat bacteria



Research: Side effects

Research common side effects that you may feel after taking medication.

diarrhea

nausea

vomiting

Research and explain the difference between experiencing side effects from medication and experiencing an allergic reaction to medication.

same

9.6 Measurements and formulas



Discussion: The importance of mathematics

Why do you think using mathematics is important in pharmacy? When do you see numbers used with medication? Discuss and make notes below.

it's very important particularly to calculate
drug dosages that patient should take
~~from~~ to cure



Activity 20

Abbreviations

Complete the table of abbreviations below.

Abbreviation	Meaning
IV	Intra venous
PO	oral (by mouth)
TOP	Topical
ml	mililitre
tsp	tea spoon
mg	miligram
ml	mililitre



Activity 21

Conversions

Convert the following units. You can use the space below for your calculations.

15g to mg $15 \times 10^3 \text{ mg}$	3kg to g $3 \times 10^3 \text{ g}$
7L to ml $7 \times 10^3 \text{ mL}$	8L to ml $8 \times 10^3 \text{ mL}$
2 hours to min $2 \times 60 = 120 \text{ min}$	4 min to sec $4 \times 60 = 240 \text{ sec}$



Activity 22

Interpreting a doctor's prescription

Imagine you are a pharmacist, read the prescription below and answer the following questions.

Prescription: Clindamycin 300mg PO, tid, ac, for 7 days.

1. What is the indicated route of administration in this prescription?

oral

2. How many times a day and for how long should the patient take this medicine?

before meal, three times a day

3. When should the patient take this medicine? Before, with or after food?

before

9.6 Measurements and formulas



Activity 25

Calculating tablets

Calculate the correct number of tablets in the following scenarios. Remember, the 'No. of tablets' section is for one dose only.

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	$\div$	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	$\div$	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	$\div$	250	=	2



Activity 24

Calculating mixtures and solutions

Look at the scenarios below. Use the calculation tables to calculate the amount of solution needed.

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	$\div$	250	X	5	=	10

Total per day = 40

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	$\div$	250	X	5	=	5

Total per day = 10

9.6 Measurements and formulas



Activity 25

Calculating IV rate

Calculate the correct IV rates in the following scenarios.

The 'total IV volume' section should be entered in ml. You may need to do a conversion.

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

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
2000	÷	16	=	125

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	÷	$\frac{90}{60} = \frac{3}{2}$	=	$\frac{100}{3}$

9.7 Safety measures in drug administration

STARTER Safety with drugs

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

medication error could happen, the effect could range from minor to fatal



Activity 26

Communication in pharmacy

Read the following scenario and answer the questions on the following page.

Scenario:

Sheikha has an infection in her tooth. The dentist prescribed her Ibuprofen 600mgs (pain killers) and Augmentin 500mgs (antibiotics). Sheikha went to the pharmacy to buy the medicines. The pharmacist asked Sheikha her age only and explained that she has to take each medicine twice a day after food for 7 days. Sheikha started taking the medicines following the pharmacist's advice, however 3 hours after taking the Augmentin 500mgs, she started feeling very itchy and noticed a skin rash and hives all over her body. Sheikha is allergic to penicillin, however she is not sure if Augmentin is penicillin or not.

Questions:

1. How do you think the communication between Sheikha and the pharmacists was?

weak

2. Write the questions that the pharmacists should have asked Sheikha before giving her the medicines.

do you have any sense of allergic reaction

3. Do you think the medicine was safe for Sheikha? Explain your answer.

No because she has allergic reaction to penicillin, which harm it.

9.7 Safety measures in drug administration



Activity 21

Matching

Match 'the six rights of drug administration' to the correct description.

Right drug	The caregiver should double-check patient's name and DOB on the label.
Right patient	The medication should only be given the route it was prescribed.
Right dosage	Administer the exact amount directed by the doctor.
Right route of administration	Thirty minutes before or after acceptable.
Right time	When you give medication, you should make a record.
Right documentation	Errors can happen if the two drugs have a similar name.

Notes:

Storage

Activity 28

Look at the images below. Explain whether you think they are being stored safely or not.

Image	Is it an example of safe storage? Explain your answer.
	No, because their are in front of baby.
	No, because he doesn't make sure that close his medicine.
	yes it's safty and close
	yes becæuse it is out (far away) of children