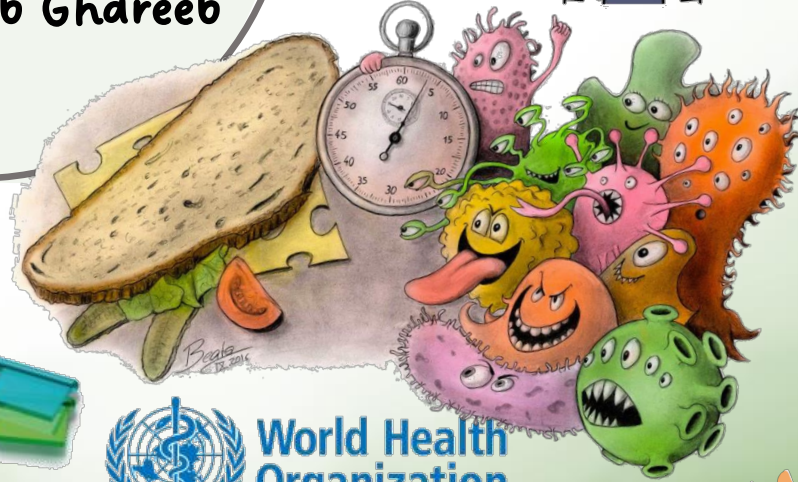


HS Final Exam Review
Term3 (2023-2022)
Grade12 **advanced**

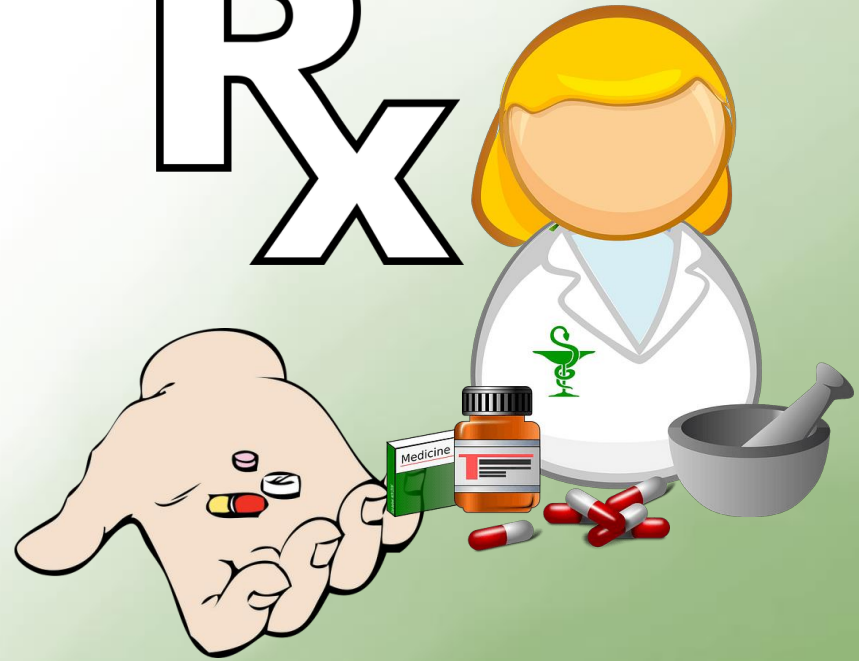
Maitha Taleb Ghareeb

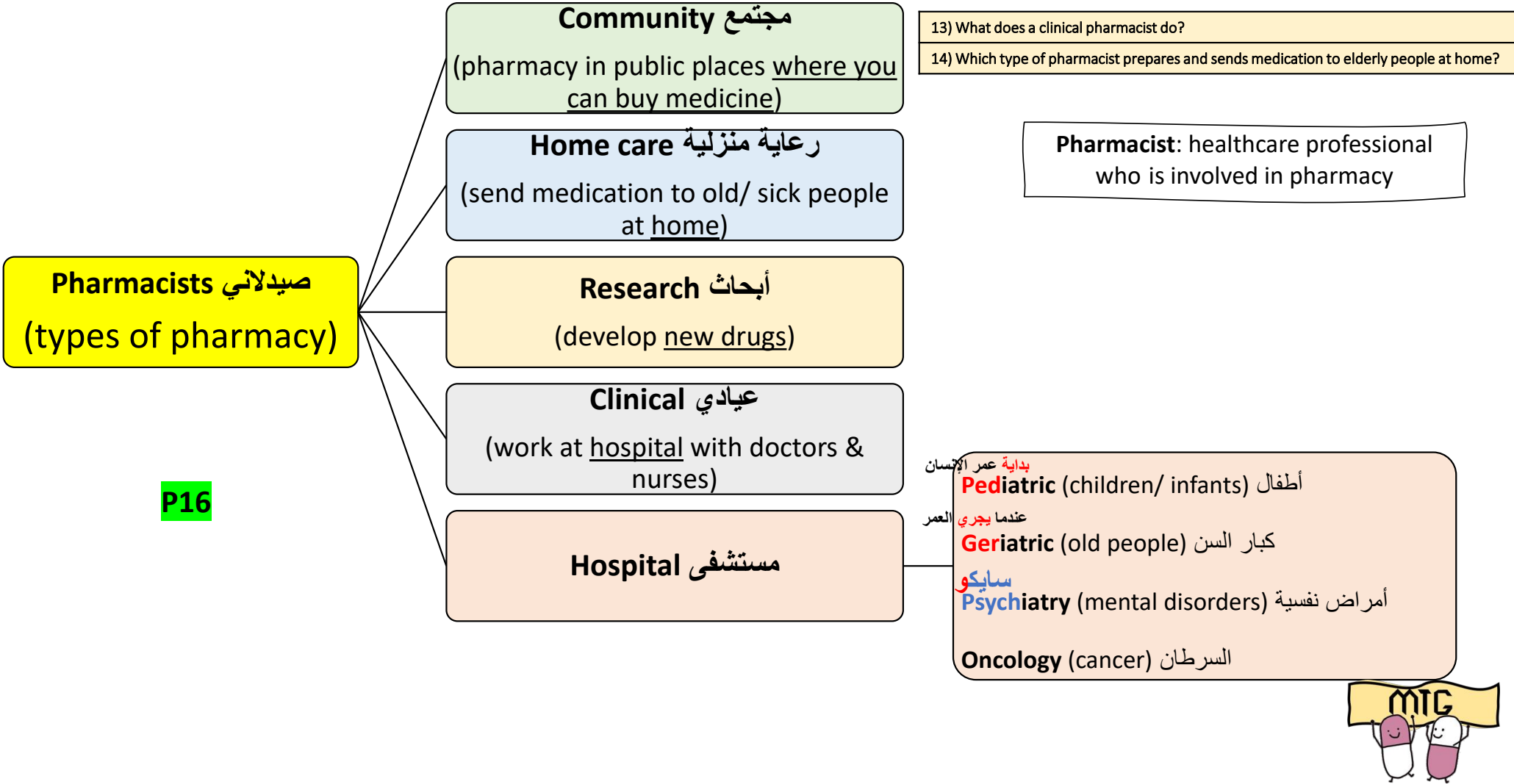


World Health
Organization



Rx

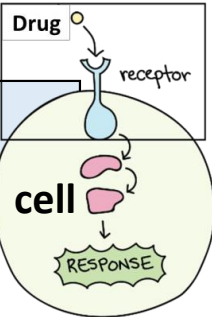
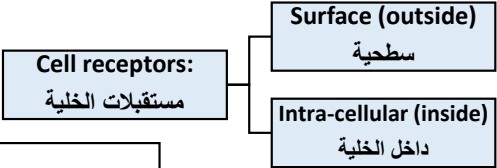




- 15) What is pharmacokinetics?
- 16) List the stages of pharmacokinetics?

P19

Pharmacology علم الدواء
(the study of drug)



Enter دخول Exit خروج

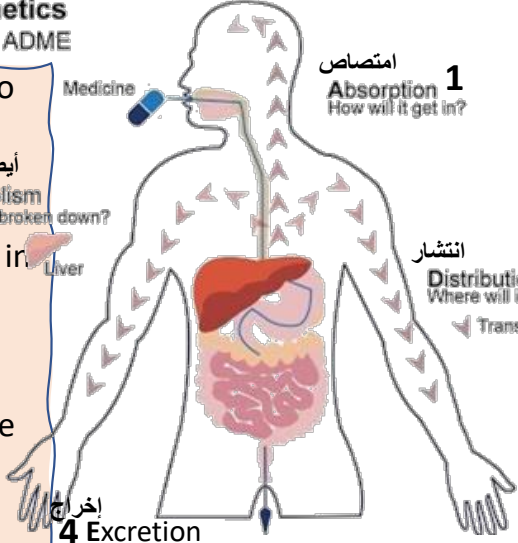
Pharmacokinetics حركة الدواء
(The study of what the body does to the drug)
What happens to the drug once it enters the body?

Pharmacodynamics تفاعل الدواء
(The study of what the drug does to the body)
دواء مُستقبل استجابة
Drug + receptor = response

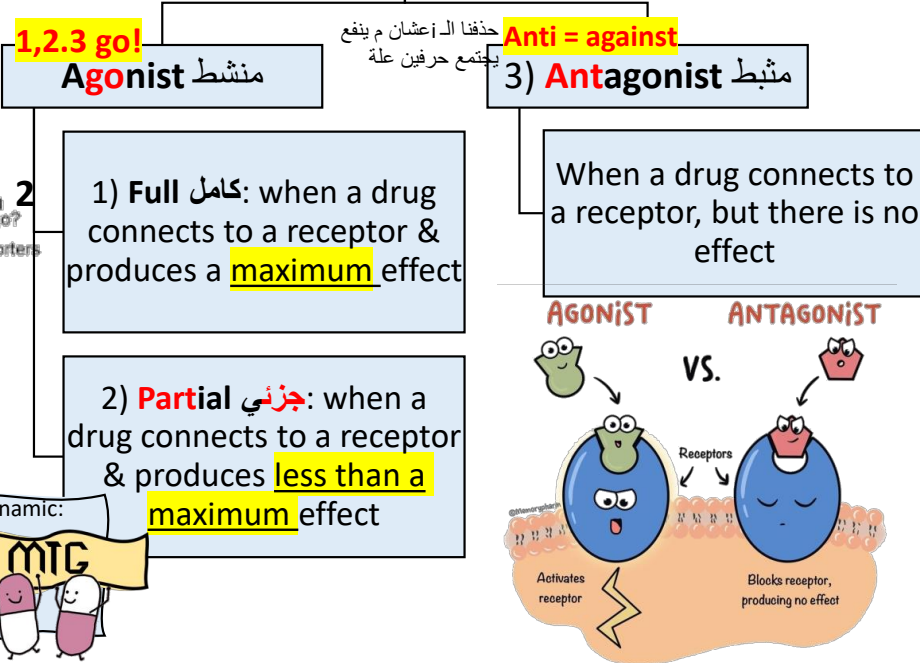
عكس بعض ≠

ADME
Pharmacokinetics
The principles of ADME

- 1) **Absorption:** how the medicine gets into the body (enter blood stream)
- 2) **Distribution:** where the medicine goes in the body (move with blood stream)
- 3) **Metabolism:** what the body does to the medicine (breaks down in liver)
- 4) **Excretion:** how the body gets rid/ remove of the medicine (eliminated in urine through kidneys)



3 levels of response



- Factors** عوامل affecting pharmacodynamic:
- 1) Patient age.
 - 2) Disease type.
 - 3) Pregnancy.
 - 4) Other drugs in the body.





PHARMACY

1) Collect drugs

2) Prepare
(making medicine)

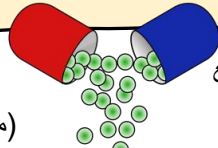
3) dispense medicine

drugs = ingredients

- ✓ Drugs are chemical substances taken from:
 - Plants (herbs)
 - Animals
 - Microorganisms
 - Minerals
- ✓ They are not used directly as a treatment.

- ✓ Excipients are used to prepare medicines.
- ✓ Helps to:
 - Formulate
 - Protect
 - Support
 - Make medicines safe to use
- ✓ Most medicines have excipients added to them.

- ✓ Medicines are directly used as a treatment.
- ✓ They are the result of mixing a drug or drugs, sometimes with or without excipient.



المادة الفعالة في الدواء
(مثال: البودرة اللي في الكبسولة)

المادة غير الفعالة في الدواء ويتم خلطها مع
المادة الفعالة لجعل الدواء سهل وآمن في
الاستخدام (مثال: الكبسولة الخارجية)

drug(s) + excipient(sometimes) = medicine

يمكن يضاف يمكن لا

Ready to be used!
الدواء جاهز للعلاج والاستخدام المباشر

طرق إعطاء الدواء Routes of administration: Provide/give

U9: Pharmacy

- 1) What forms of medication are given via the topical route of administration?
- 2) Which route of administration are medical infusions given via?

- 44) Which type of injection is administered into the bloodstream through a vein?
- 45) Which type of injection is administered into the lower layers of the skin?

Oral-B **PO** فموي 

(through the mouth)

Time until effect:
20 mins – 1 hour

Forms of medication:

- Capsules
- Liquid
- Pastilles
- Powder

Advantages:

- ✓ Easy/ safe/ cost-effective (cheap)
- ✓ **Slow-release** (need only to be taken once/ twice a day)

Disadvantages:

- X Unpredictable absorption rate
- X It take time to show any effect (go through digestive system)

SL تحت اللسان
Sublingual (under the tongue) & buccal (between gum & check) 

Time until effect:
3-5 mins

Forms of medication:

- Small tablets
- Films
- Wafers
- Sprays

Advantages:

- ✓ Very fast (during a heart attack)
- ✓ Lower doses
- ✓ If the patient cannot swallow or nauseatic

Disadvantages:

- X Uncomfortable to hold small tablets for a long time
- X Eating/ drinking while holding the tablet can affect the absorption

TOP موضعي
Topical (applied directly on affected area)
Easy reached areas: skin/ eyes/ ears/ nose

Time to take effect:
Variable (minutes to hours)

Forms of medication:

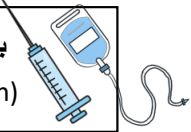
- Creams
- Lotions
- Gels
- Ointments
- Sprays
- Liquids

Advantages:

- ✓ Easy to apply
- ✓ Low risk of side effects

Disadvantages:

- X Not well absorbed into deep layers of skin
- X Absorption can be slow
- X Stain cloths

P28-29 بالحقن (injection/ infusion) 

Intra-dermal: في الجلد

Into skin layers
e.g., allergy test

Intra-venous: في الوريد

Into vein
e.g., saline infusion
(takes from 30-60 seconds)

Sub-cutaneous: SC تحت الجلد

Into fat under skin
e.g., insulin infusion
(take from 15-30 mins)

Intra-muscular: IM في العضل

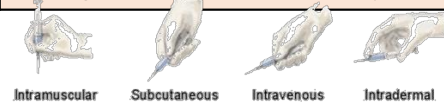
Into muscle
e.g., vaccine
(take from 10-20 mins)

Advantage:

- ✓ Faster drug action
- ✓ Useful for unconscious patients

Disadvantage:

- X Require aseptic conditions
- X Can be painful
- X Most injections are not self-administered
- X Dangerous if administered incorrectly



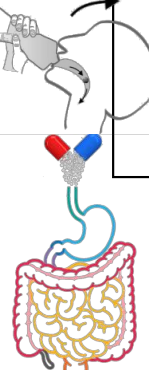
Sub- = under = تحت
مثال: sub-title الذي هو العنوان الذي يكون تحت العنوان الرئيس

lingual اشتقينا كلمة من language
وطبعاً م ن قدر نتكلم أي لغة من غير اللسان
فكلمة **lingual** لها علاقة باللسان.
Sub-lingual = تحت اللسان

تذكر:

inter ≠ intra
Inter = between
مثال: intern-net "الشبكة البينية"
Intra = inside = داخل

الأدوية الفموية بطيئة التأثير لأنها لازم تمر في الجهاز الهضمي



Antibiotics: المضادات الحيوية

تذكر:
Anti- = against مضاد / ضد
Ante- = before قبل

What is antibiotic?
(e.g., penicillin)

Medication to destroy or slow the growth of **bacteria**

Examples of bacterial infections:
Tuberculosis "TB" /
cholera/ tonsillitis

Can be used to treat viral infections (e.g., COVID-19/ flu/ cold/ chickenpox)?

No

Routes of administration?

Mainly oral

Injection (parenteral)

Topical (directly applied on infected area)

Why is it important "to complete the course" of antibiotic even after you feel well?

To make sure that all bacteria are destroyed & to avoid "antibiotic resistance"

That is why most antibiotics need a few hours to fight bacteria

What is antibiotic resistance? Why does it happen?

The overuse of antibiotics develop super bacteria!

Meaning the antibiotic becomes useless against bacteria & no longer effective!

when to prescribe antibiotics?

Conditions include:

- #If the infection is unlikely to clear up without antibiotic.
- #If the infection could spread if not treated.
- #If antibiotic can speed up recovery significantly.
- #If there is a risk of more dangerous complications

Side effects: التأثيرات الجانبية
(harmful/ unwanted effects)

Common side effects:

- #Diarrhea إسهال
- #Nausea غثيان
- #Vomiting قيء
- #Rash طفح جلدي
- #Upset stomach مغص

Less common/ rare side effects:

- #Kidney stones حصى كلى
- #Blood clotting & disorders اضطرابات دم وتخثر
- #Bowel inflammation التهاب في الأمعاء

- ✓ Side effects range from mild to life-threatening (very rare).
- ✓ Some medications show side effects in 1 out of 10 people, other medications side effects show only in 1 out of 10,000 people.



Why is it importance to interpret abbreviations correctly?
Ensure patient's safety & avoid **medication errors** (underdose or overdose)

P37

Abbreviations:

اختصارات

11) On a prescription, what is the Latin abbreviation meaning 'three times a day'?

12) On a prescription, what is the Latin abbreviation meaning 'two times a day'?

Measurements:

قياسات

kg = kilogram
g = gram
mg = milligram
mcg = microgram
ml = milliliter
tsp = teaspoon (5ml) ملعقة صغيرة

Routes of administration:

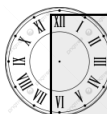
طرق إعطاء الدواء

IM = Intra-muscular
IV = Intra-venous (vein)
PO = By mouth (O = oral)
SC = Sub-cutaneous
SL = Sub-lingual
TOP = Topical

Others:

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

مصطلحات
تخص
المرض



Roman numbers:

أرقام رومانية

i	ii	iii
I	II	III
1	2	3

hour تشبه hora
Somni تشبه الكلمة العربية
"نوم" بمعنى "نوم"
ساعة النوم

start now!

Latin:

مصطلحات واختصارات لاتينية

Prescription: الوصفة

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

Rx:

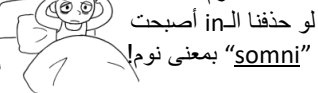
أيام أول كانوا يستخدموا كلمة "recipe" وبعدين
تغيرت لـ prescription بس الاختصار م تغير

كلمة "cibum" تشبه كلمة "سينابون"



cibum = meal = وجبة

كلمة "insomnia" بمعنى الأرق وعدم القدرة على
النوم.



لو حذفنا in أصبحت
"somni" بمعنى نوم!

Prefix bi- :

bicycle

bi- = 2



Prefix tri- :

triangle



المثلث عنده ثلاث
زاويا

Prefix quad- :

quarter

الرابع له علاقة
بالرقم 4

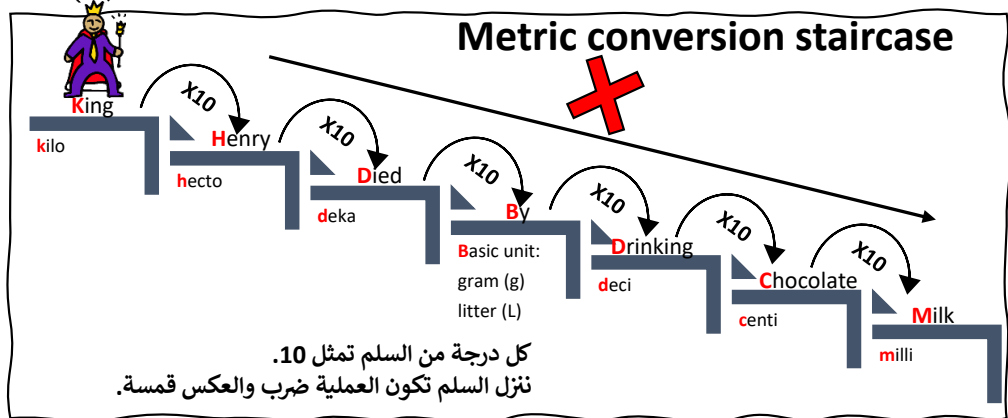


quad- = 4



Example: "Rx Ondansetron 4mg, IV, qid, PRN, nausea"

Prescription: Ondansetron 4 milligram, intravenous, four times a day, if needed by patient to treat nausea.



Convert the following units:

15g to mg
 $15 \times 1000 = 15000 \text{ mg}$
 نزول الدرج يعني ضرب.
 نزلنا 3 درجات يعني نضرب في 1000

7000g to kg
 $7000 \div 1000 = 7 \text{ kg}$
 صعود الدرج يعني قسمة.
 صعدنا 3 درجات يعني نقسم على 1000

Convert 180 seconds to minutes.
 $1 \text{ min} \times ? = 60 \text{ s}$
 $180 \text{ s} \div 60 = 3 \text{ mins}$
 حركة المقص بتساعدكم في تحويل الوقت وحساب الجرعات



Calculating drug dosages: حساب جرعات الأدوية

Tablets الحبوب

Example: The doctor prescribed 500mg of a drug that is available in a stock strength of 100mg. Calculate how many tablets are needed using the basic formula.

$1 \text{ tablet} = 100 \text{ mg}$

$1 \text{ tablet} \times ? = 100 \text{ mg}$
 $(1 \times 500) \div 100 = 5 \text{ tablet}$

Mixtures & solutions المحاليل والمخاليط

Example: The doctor prescribed a 500mg dose of solution. It is available in a strength of 250mg/5ml. How much solution is needed?

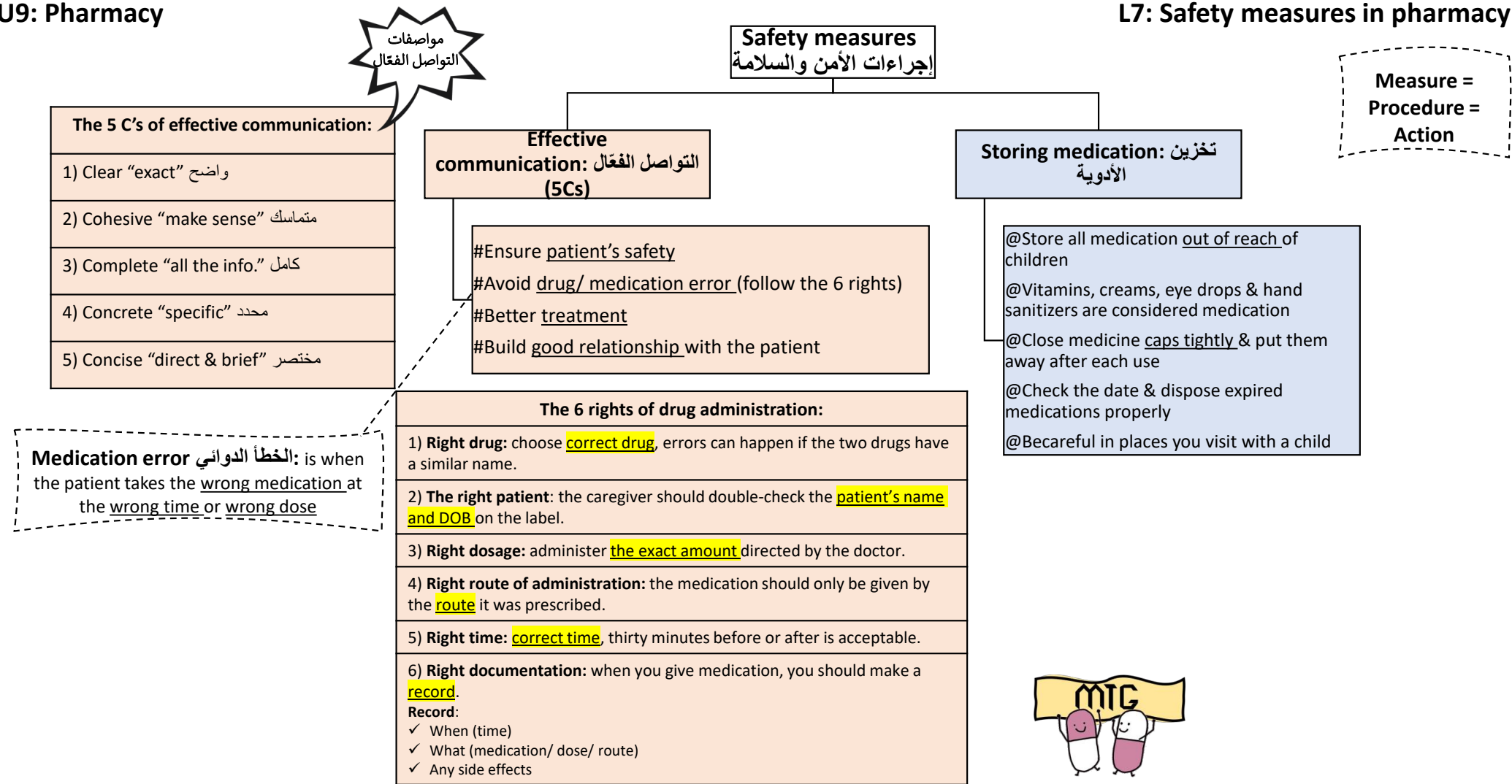
$5 \text{ ml} \times ? = 250 \text{ mg}$
 $(5 \times 500) \div 250 = 10 \text{ ml}$

IV rate (ml/hr)

Example: The doctor prescribed 120ml of IV liquid medicine over a period of 3 hours. How much liquid is administered per hour?

$120 \text{ ml} \div 3 \text{ hrs.} = 40 \text{ ml/hr.}$

P44



P58



Foodborne illness/
foodborne disease
(food poisoning)

- 3) What are the signs and symptoms of foodborne illness?
- 4) What are disease-causing microorganisms?

Definition

An **illness** that happens as a result of **eating foods containing** disease-causing **microorganism**



- Bacterial such as:
- Campylobacter
 - Escherichia coli (E. coli)
 - Salmonella
 - listeria

Causes (mostly microorganism/
dangerous substances)

Virus Bacteria Protist Fungi

Bacteria (most common cause)

Viruses

Parasites

Fungi

Chemicals

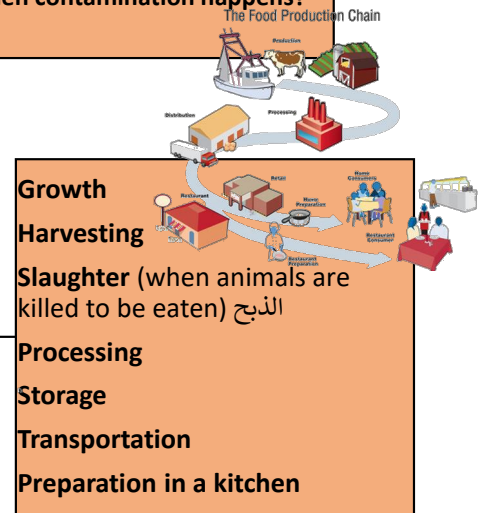
تذكروا: البكتيريا مثل أي كائن حي تحتاج للغذاء/ الماء أو الرطوبة/ للدفي والوقت.

Signs & symptoms
(occur **from 6-72 hours** after eating contaminated food)

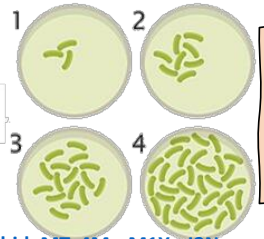
- Nausea
- Vomiting
- Abdominal cramps
- Diarrhoea
- Fever and chills
- Nausea, vomiting



متى يحصل تلوث الطعام؟
When contamination happens?



- Bacterial growth (multiplying تضاعف) conditions:
- **Time** – bacteria double every 15 minutes
 - **Warmth** – bacteria need warmth (5-60°C) to multiply (the ideal temperature is 37 °C)
 - **Food** – bacteria need nutrients to grow (especially **protein** "high risk foods")
 - **Water** – bacteria need **moisture** to grow



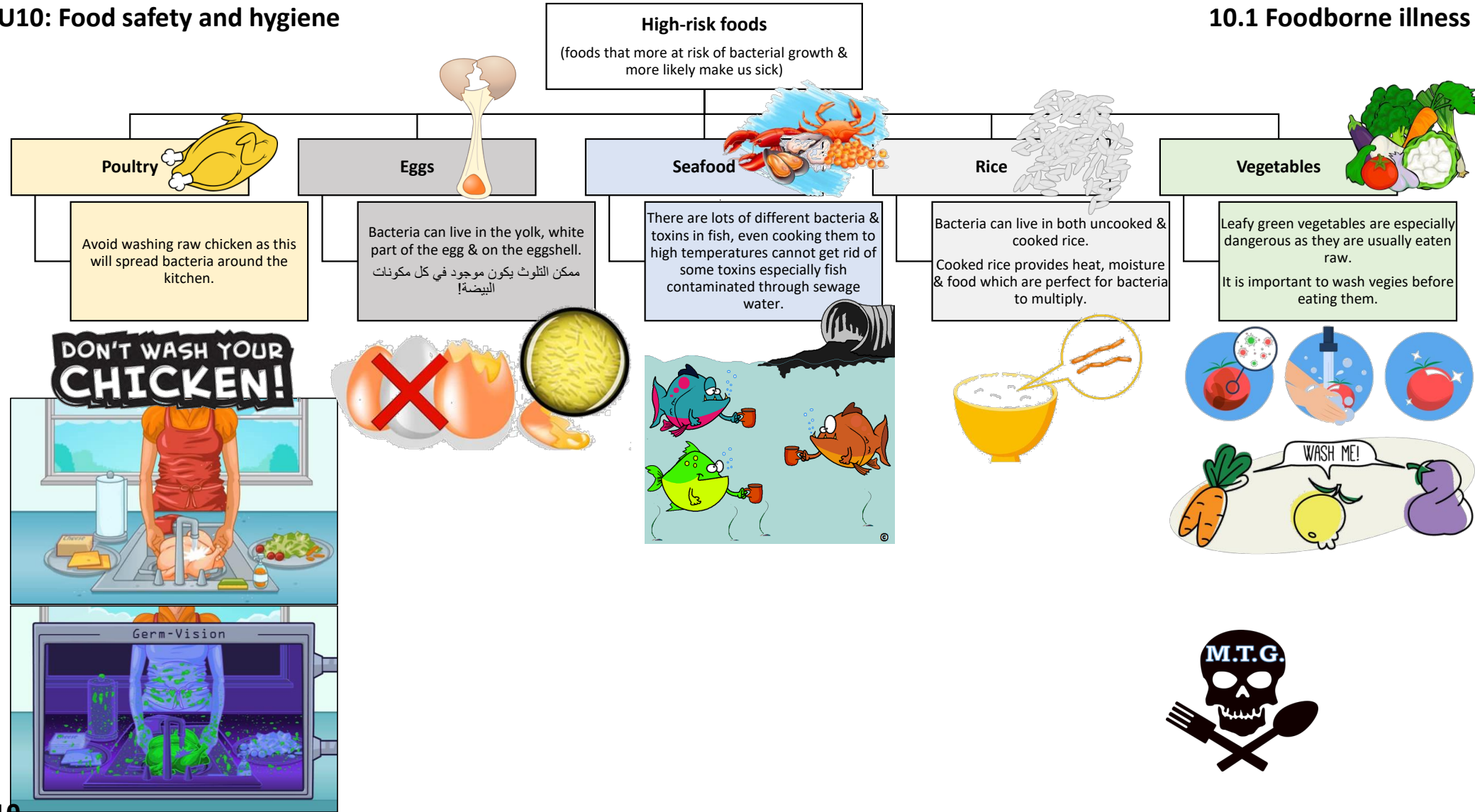
Within 6 hrs., one bacterium can multiply to over 16 million bacteria.

Food Poisoning Chain

For bacteria to grow they need:

Warmth Moisture Food Time

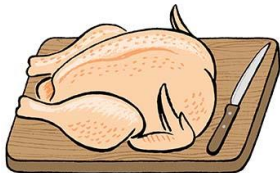
U10: Food safety and hygiene



P68

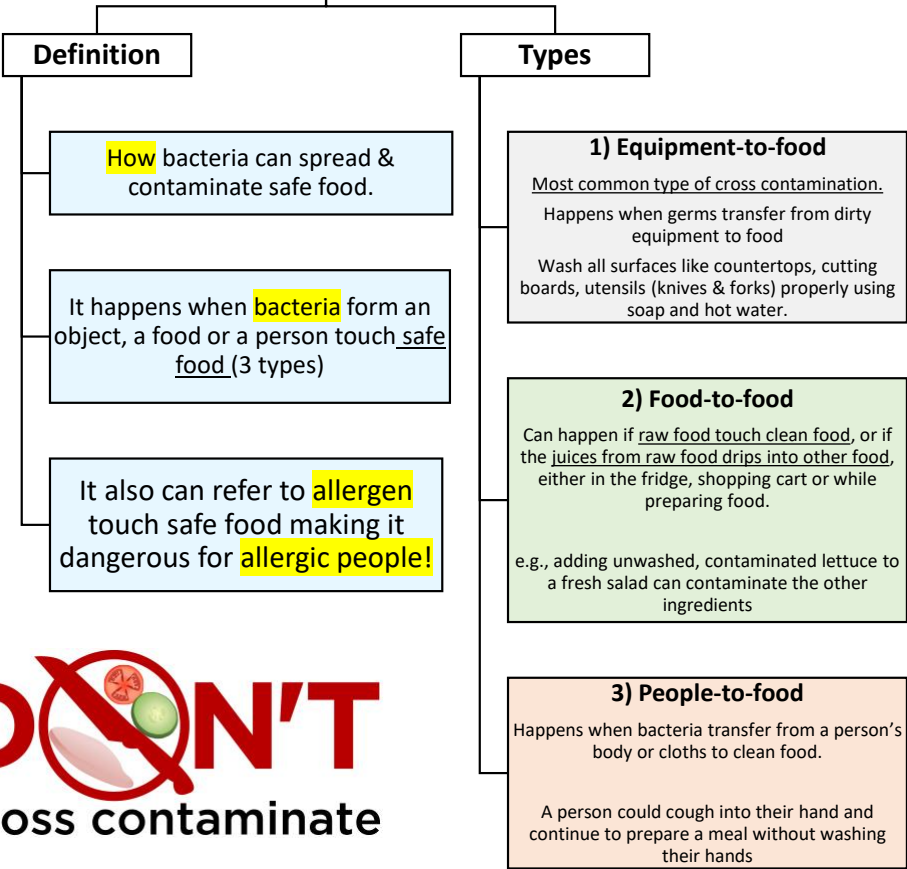


Contaminated food: when a harmful or unwanted substance such as bacteria gets into food.
X Eating contaminated food cause foodborne illnesses which may lead to other complications

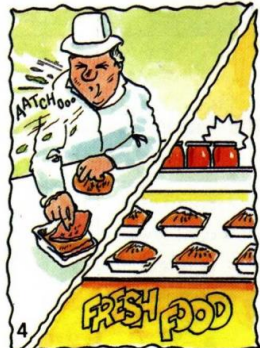


DON'T
cross contaminate

Cross-contamination
انتقال التلوث



- 19) Describe food-to-food cross contamination.
- 20) What is equipment-to-food cross contamination?



Prevent cross contamination

Use the correct colour coded chopping boards and knives

Raw meats and poultry only

لون الدم

Raw fish and shellfish only

لون البحر

Raw unwashed vegetables, salads and fruits only

لون التراب

Ready to eat and cooked foods only

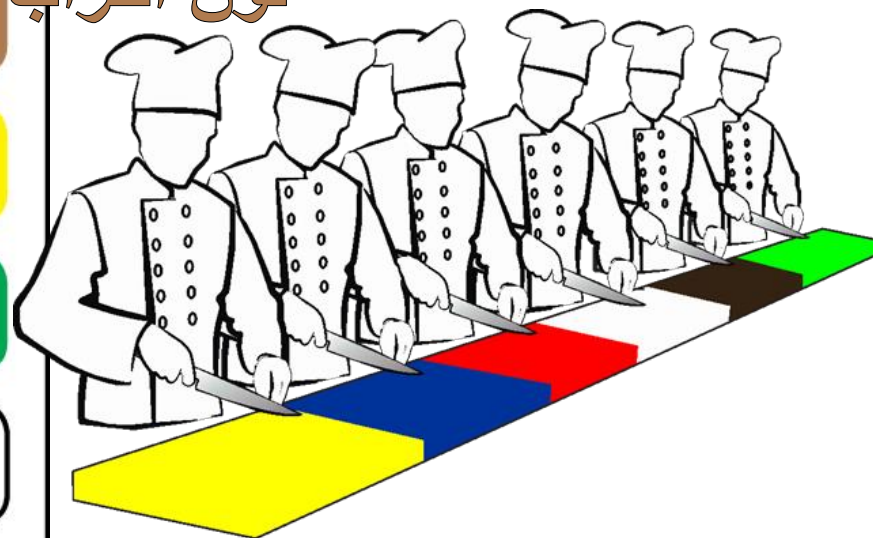
لون الخضار

Washed vegetables, salads and fruits only

Bakery and dairy products only

لون الحليب والطحين

Food hygiene act 1996



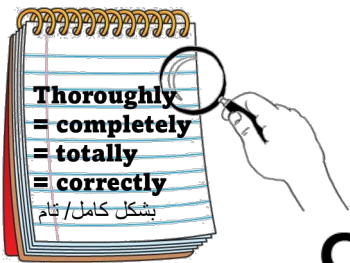


5
Keys



<https://youtu.be/ONkKy68HEIM>

5 keys for food safety

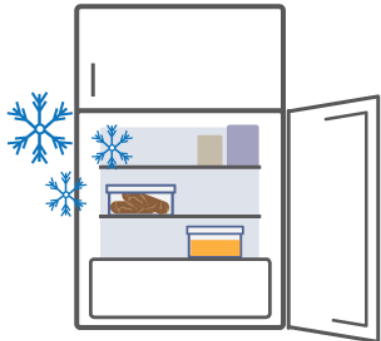
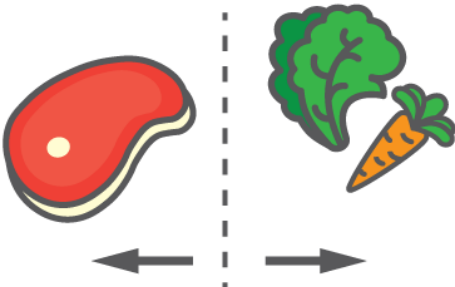


CLEAN

SEPARATE

COOK Thoroughly

CHILL



Cleaning: the process of removing dirt & crumbs of food.

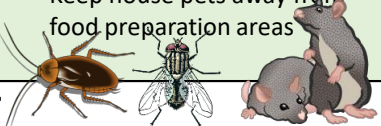
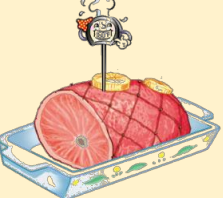
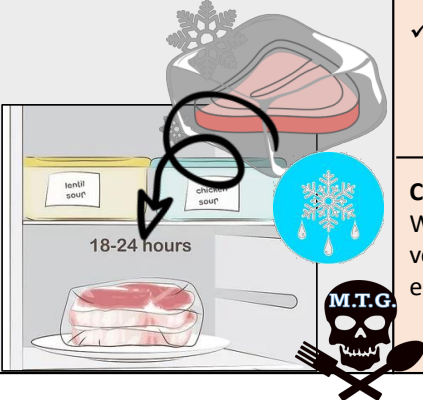
Sanitizing: the process of killing germs/ disinfecting.

تذكروا: الأكل المطبوخ يخزن في الرف العلوي والأكل النيء واللحوم تحت عشان نمنع انتقال الجراثيم.
Cooked food should be kept above raw food to avoid cross-contamination!



SAFE WATER & FRESH RAW MATERIAL

21) What should be done with leftovers before putting them in the fridge?		23) In which section should raw meat be placed in a fridge?	
22) How long should leftover food be cooled before storing it?	5 keys to safer food	24) In which section should cooked meat be placed in a fridge?	

1) Keep clean	2) Separate	3) Cook thoroughly	4) Keep food at safe temperature	5) Use safe water & raw material
A) Wash hands with warm water & soap for at least 40s to kills germs. 	A) Use separate chopping boards & knives to handle different foods (you can follow color code strategy to avoid cross-contamination)	A) Cooking food to 70°C kills bacteria so food is safe to eat 	A) Cool food (below 5°C) and store all leftover/ cooked food quickly. Slice larger pieces of meat into smaller pieces and place food in a clean, cool container	A) Safe water is free from dangerous bacteria and chemicals that could cause illness  Safe water is needed to: ✓ Wash fruit and vegetables ✓ Add to food and drinks ✓ Make ice ✓ Clean cooking equipment ✓ Wash hands
B) Cleaning plates and kitchen equipment How? Wash (with hot water + detergent) and sanitize all surfaces and equipment used for food preparation to kill germs	B) In the fridge, store <u>raw meat</u> <u>seafood</u> and <u>poultry</u> on shelves or sections <u>below</u> <u>cooked</u> foods to <u>avoid cross-contamination</u> 	B) Use a thermometer to check that the food has reached 70°C  C) Make sure <u>thermometer</u> is <u>cleaned</u> and <u>sanitised</u> after each use	B) Leftover food should not be stored in the fridge for more than 3 days and should not be reheated more than once	B) Be careful when buying raw materials: ✓ Select fresh foods ✓ Avoid rotten food ✓ Choose pasteurized dairy products ✓ If you are buying ready-to-eat cooked foods, make sure they are stored correctly (not in danger zone) 
C) Protect food from pests (roaches, mice, rats, flies, and insects) Pets carry pests in their fur or their feet. Tips to protect food from pests: ✓ Cover food ✓ Rubbish bins should be covered ✓ Remove rubbish regularly ✓ Food preparation areas should be in good condition ✓ Keep house pets away from food preparation areas 	C) Store food in sealed containers to stop raw and cooked foods from touching 	D) If you don't have a thermometer, you can: ✓ Cook meat and poultry until the juices are clear and the inside is not pink ✓ Cook eggs and seafood until piping hot ✓ Allow soups & stews to remain boiling for at least 1min 	C) For hot food let it cool until there is no more steam, but do not leave it for more than 2hrs.	D) Thaw frozen food in the <u>fridge</u> (the best way to thaw frozen food) 
				C) When preparing food: Wash and peel fruits and vegetables to reduce the risk of eating dangerous bacteria 

When to wash your hands?

How to wash your hands?



After touching an animal or pet food



After touching garbage



After using the bathroom



Before & After cleaning a wound



After touching raw fish, meat, or poultry



After coughing, blowing your nose, or sneezing



Before preparing or eating food



Before inserting & removing contacts

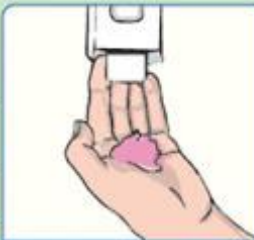


If something looks clean it doesn't mean that it is.
It takes over 2.5 billion bacteria to make a 250 mL of water cloudy!
In some cases, it takes only 20 harmful bacteria to make someone sick!

FIGHT GERMS BY WASHING YOUR HANDS!



1 Wet your hands



2 Soap



3 Lather and scrub - 20 sec



4 Rinse - 10 sec



5 Turn off tap



6 Dry your hands

DONT FORGET TO WASH:

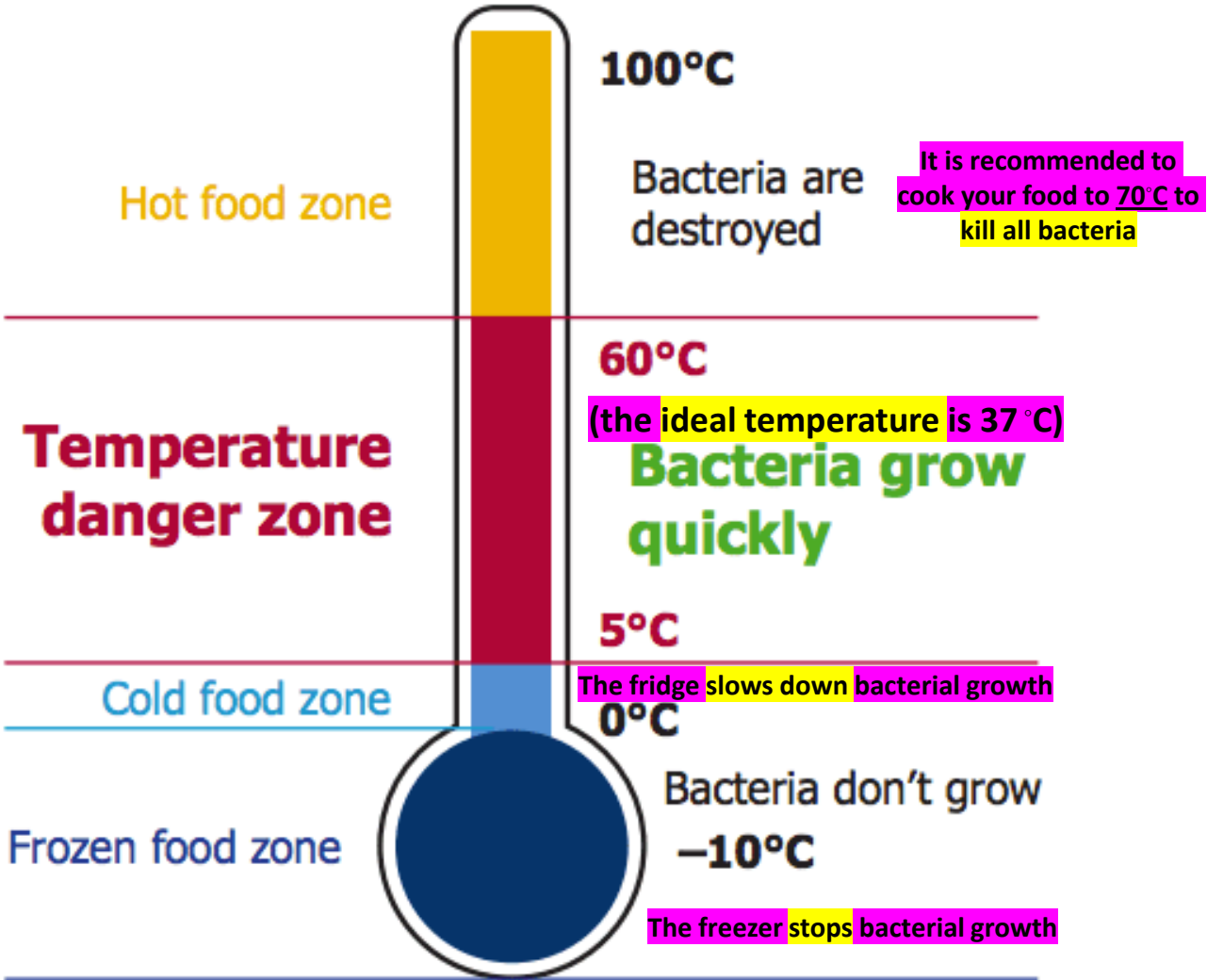
- between your fingers
- under your nails
- the tops of your hands

- 1) Wet hands under running water
- 2) Rub hands for at least 40 seconds with soap
- 3) Rinse the soap from hands under running water
- 4) Dry hands with a clean dry towel



U10: Food safety and hygiene

- 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



U10: Food safety and hygiene



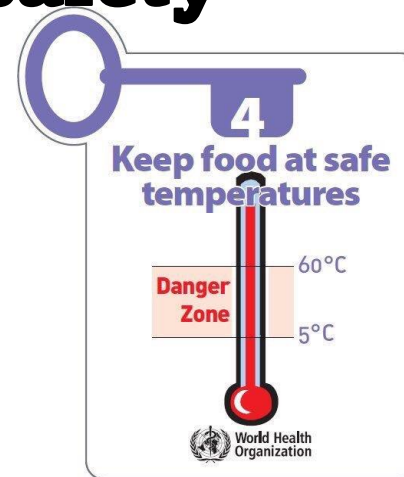
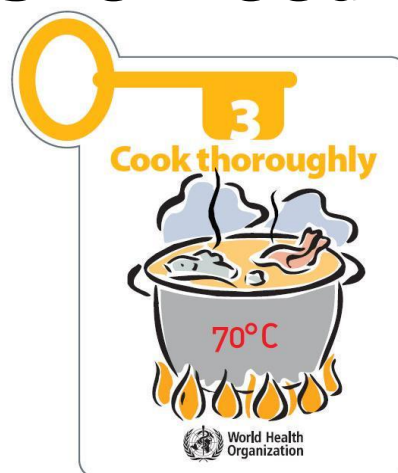
To prevent food-to-food cross-contamination



Right Zones in the Fridge

for safe food storage

5 keys for food safety

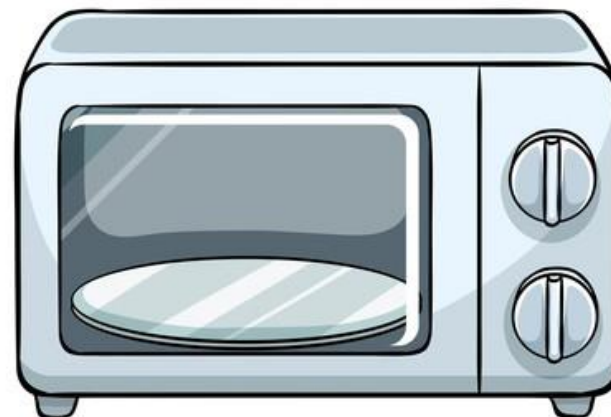


Microwave oven safety guidelines:

Make sure that the food is cooked or reheated to at least 70°C all the way through the center.

Some plastic containers release toxic chemicals if they are heated so avoid using them.

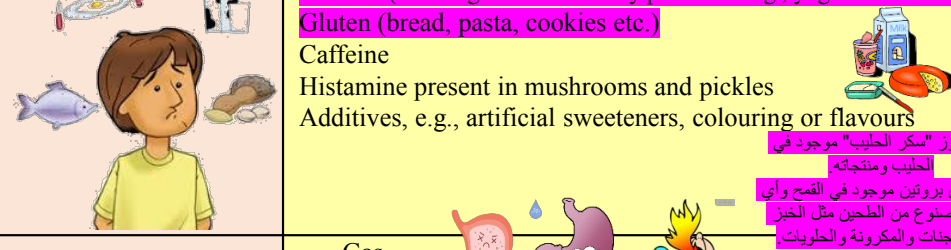
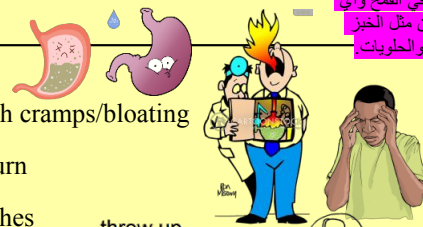
Always check that the equipment you are using is microwave safe.



- 25) What is lactose?

26) What is gluten?
- 27) List some types of food intolerance.

28) What is a food intolerance?

Disease	Food allergyحساسية الطعام	Food intoleranceعدم تحمل الطعام
Definition	The body’s immune system responds to certain food	✓ The body cannot digest the food properly ✓ When a certain food irritates the digestive system
Which system of the body is involved?	Affects the <u>immune system</u>	Affects the <u>digestive system</u>
How serious is a reaction?	It can be fatal (life-threatening/ anaphylaxis)	It is <u>not life-threatening</u>
Does eating a small amount cause a reaction?	Yes, even traces (<u>small amounts</u>) can induce an allergic reaction	No, a reaction may only happen when <u>a lot of the food</u> is eaten
Does it happen every single time?	Yes, a reaction happens every time	No, a reaction may only happen if the food is eaten often
Does the signs & symptoms show immediately?	Yes, it usually comes on suddenly	No, it usually comes on gradually
List some common foods that can cause reactions	Allergens include: Peanut Eggs Gluten (protein in wheat/ barely/ rye) Dairy products Mustard Seafood Sesame seeds 	Lactose (milk sugar found in dairy products “e.g., yogurt & cheese”) Gluten (bread, pasta, cookies etc.) Caffeine Histamine present in mushrooms and pickles Additives, e.g., artificial sweeteners, colouring or flavours 
Sings & symptoms	Rashes or hives Itchy mouth Swelling of face, tongue and lips Trouble breathing  الأعراض المشتركة!	Gas Stomach cramps/bloating Heartburn Headaches  تشبه أعراض القولون! Nausea Abdominal pain (stomachache) Diarrhea Vomiting 



P91-93

Therapeutic diet: the use of diet or certain foods to treat & manage diseases.

Therapeutic diets:
الحميات العلاجية

Types of therapeutic diets:

Who benefits from therapeutic diets?

Importance?

Why are therapeutic diets needed?

- 29) Which type of patients require a texture modified diet?
- 30) Name a medical condition that requires a texture modified diet.
- 35) What is a nutrient modified diet?
- 36) Give an example of nutrient modification

Nutrient modification: تعديل المواد الغذائية
One or more nutrients are added or removed from the diet.

- #Low sugar diet
- #Low sodium/ salt diet
- #Low-fat diet
- #Renal diet (low sodium, potassium & phosphorous) لمرضى الكلى
- #High fibre diet

Texture modification: تعديل القوام
Modify consistency of food to make easy to eat

- A) **Soft:** طري cooked & cut easily
- B) **Minced & moist:** مفروم ورطب mashed easily ADULT 4mm
- C) **Puree:** عصبية smooth + lump free (no lumps)

Tube feeding: التغذية عن طريق الأنابيب
عن طريق الأنابيب

- Tube through the nose or mouth down the esophagus into the stomach
- Tube directly into the stomach

Food allergy/intolerance modification



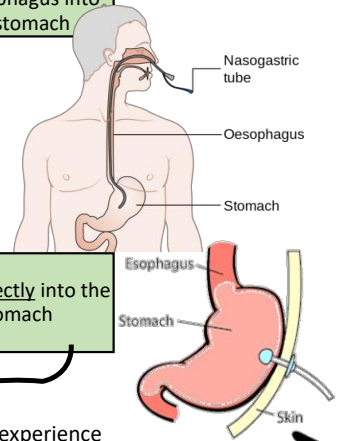
Additional feeding



Patients with the following conditions:
@Cardiovascular disease
@Obesity
@Diabetes
@Food allergies
@Digestive diseases
@Eating disorders (e.g., anorexia)

- *Reduce the amount of needed medications.
- *Increase quality of life & life expectancy.
- *Can cure some conditions.

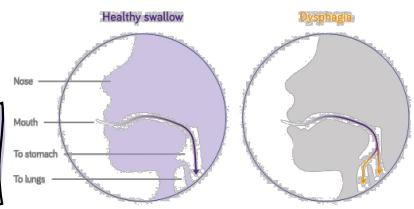
- Reasons:**
- ^increase/ decrease/ eliminate a type of food/ a nutrient
 - ^improve nutritional status
 - ^extra calories for weight gain
 - ^balance the diet
 - ^remove foods that affect medication
 - ^help with digestion
 - ^remove foods due to allergies
 - ^texture changes due to problems with chewing or swallowing (dysphagia)



Both can be used with people who experience "difficulty swallowing" (dysphagia) عسر البلع

- ✓ The brain controls swallowing process.
- ✓ When the brain fails to register when food reaches the pharynx dysphagia happens

<https://youtu.be/9VNwajrd2-k>



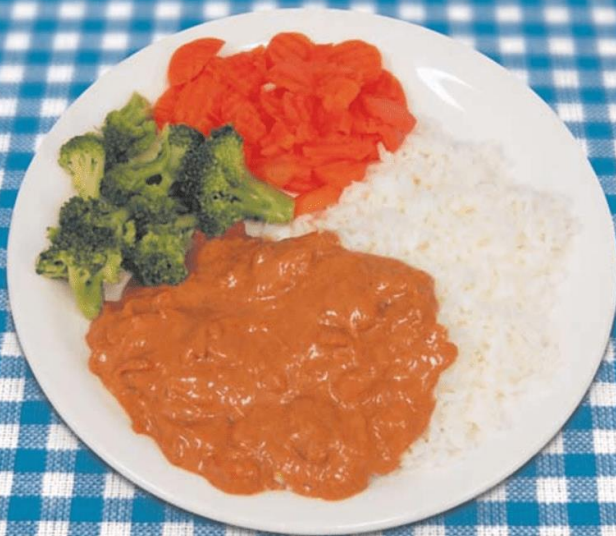
صفحة 25 من الملخص فيه حركة بتساعدكم في تذكر المصطلح!



<https://youtu.be/BqJlmLCzqs>

Texture A Soft

Food may be naturally soft or may be cooked or cut to alter its texture



https://youtu.be/yHESH_kNJCA

Texture B Minced and Moist

Food is soft, moist and easily mashed with a fork; lumps are smooth and rounded



<https://youtu.be/1Roc5G0GPf0>

Texture C Smooth Pureed

Food is smooth, moist and lump free; may have a grainy quality



33) What is the energy balance equation?

34) In the energy balance equation, where does our energy input come from?

$$BMI = \frac{\text{weight (kg)}}{\text{height}^2 (\text{m}^2)}$$

BMI
(body mass index)

BMI category	Range
Underweight	<18 (less than 18)
Normal/ healthy	18-24.9
Overweight	25-29.9
Obese	≥30 (above 30)

Overweight increases the risk of developing:

- Diabetes
- Heart diseases
- Cancer

**What controls weight? (energy
balance)**

Energy input
(macronutrients:
foods + drinks)

Energy output
(burning calories):

How to lose weight?

Keep a **negative energy** balance:

Diet

Physical activity

More physical activity
Increase the intensity

Eat more:

- Protein (lean meat/ legumes/ fish/ eggs)
- Fibres (help with digestion + make you full for long)
- Calcium (milk & dairy products)
- Fruit & vegetables
- Cereals (whole grains)
- Variety of foods
- Drink plenty of water



Reduce:

- X saturated fat
- X sodium/ salt
- X sugar
- X processed food

BMR (basal metabolic rate):

Basic functions to
rest”:

Breathing التنفس
Blood circulation الدورة الدموية
Sleeping

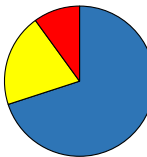
Physical activity: النشاط البدني

Anything that raises heart rate
Daily activities count e.g., walking upstairs

TEF (thermal effect of food): التأثير الحراري للأكل

Chewing المضغ
Digest الهضم
Store food تخزين الطعام

Energy output



■ BMR ■ Physical activity ■ TEF

Energy in

Energy out

Energy balance = Energy input – Energy output

Energy balance	Energy in put	Energy out put
Processes? Include:	Food & drinks	BMR + physical activity + TEF
Effect on weight?	Positive + (add to weight)	Negative –
What will happen to the weight on the long-term?	Gain weight اكتساب وزن	Lose weight نقص وزن

Example: see next page!

Amal

Energy input: 2642kcal

BMR: 1428kcal Physical activity: 397kcal TEF: 128kcal

Total energy output = 1428 + 397 + 128

= 1953kcal

Does Amal have positive or negative energy balance?

Energy balance = Energy input – Energy output

Energy balance = 2642 - 1953

Energy balance = 689kcal

Positive energy
balance

What changes will Amal see over time if she continues to have this energy balance?

She is going to **gain weight**Amal has a BMI of 28.

She wishes to reduce her BMI to a normal weight through diet and exercise.

What is her BMI classification? **Overweight**

BMI category	Range
Underweight	<18 (less than 18)
Normal/ healthy	18-24.9
Overweight	25-29.9
Obese	≥30 (above 30)

What advice would you give to Amal to help her to reduce her BMI? Consider her energy balance and dietary recommendations overweight.

✓ **She needs to lose weight.**

✓ Diet (increase: fibres + lean meat + legumes + cereals + fruit & vegetables/ reduce: saturated fat, processed food, sugar, salt)

✓ Increase the time or the intensity of exercise

