



المملكة العربية السعودية  
جامعة الملك سعود  
كلية العلوم  
قسم الكيمياء الحيوية

المضادات الحيوية (BCH 476)

# Antibiotics

## Lecture 4

*Choice & administration of antibiotics to humans*

# Choice of antibiotics introduced to human

**To select certain antibiotic for therapy we must take into consideration some important points:**

- Identifying infecting organism (Bacteria, virus .....
- Determining the effective dose
- Evaluating drug sensitivity
- Determining the target site of infection
- Determining drug safety/side effect profile
- Considering patient factors
- How much does it cost?

# Choice of antibiotics introduced to human

## a- Identifying infecting organism

- The type of given antibiotic depends on the type of microorganism infecting the patient
- Also for certain infectious diseases, the antibiotic of choice is known to which the pathogen is nearly always susceptible.
- Some antibiotics are used for treating bacterial infections and others to viral or parasitic infections, etc.

# Choice of antibiotics introduced to human

## b- Determining the effective dose

- The dosage of antibiotic must provide a sufficient concentration at the site of infection to ensure bacterial inhibition.
- Certain points must be taken into consideration:
  - The susceptibility of the pathogen towards the antibiotic
  - The tolerance of the antibiotic in the patient regarding the age and body weight
  - The site of infection.

# Choice of antibiotics introduced to human

## c- Evaluating drug sensitivity

- **Antibiotic sensitivity** is a term used to describe the susceptibility of pathogen to antibiotics.
- **Antibiotic Susceptibility Test (AST)** is usually carried out to determine which antibiotic will be most successful in treating a bacterial infection *in vivo*.
- Testing for antibiotic sensitivity is often done by the Kirby-Bauer method or disc method.

# Choice of antibiotics introduced to human

## d- Determining the target site of infection

- The target of pathogen is well known.
- Ex. Some types of bacteria infect respiratory system and others infect urinary tract or digestive system, etc.
- Antibiotics are classified by different ways, some of them depends on the target of infection which reflects the target of antibiotics.
- Ex. Amoxicillin is the antibiotic of choice to treat respiratory tract infection ,,,

# Choice of antibiotics introduced to human

## e- Determining drug safety/side effect profile

- Some antibiotics cause some minor problems when given. These effects are called side effects
- Side effects range from slight headache to a major allergic reaction.
- One of the most common side effects is diarrhea, which results from the antibiotic disrupting the balance of intestinal flora.
- Other side effects can result from interaction between the antibiotic and other drugs.
- The side effects can be reduced by changing the timing and the way of administration, like taking it after or during a meal or by intravenous injection etc.

# Choice of antibiotics introduced to human

f- Considering patient factors

g- Considering costs

- Some patients are hypersensitive against some antibiotics, like sensitivity towards ampicillin.
- Some pathogens (inside a patients) develop resistance against some antibiotics due to a misuse.
- The economical value of treatment is also important in dealing with certain disease.



# Administration of antibiotics

There are many ways to introduce antibiotics. Some antibiotics can be given by any mean but others no.

## **Antibiotics can be administered as:**

1. Oral administration as capsules, tablets or syrup
2. Intravenous injection for rapid and more effective therapy
3. Local application as cream, eye drops or ointment

# Administration of antibiotics (cont.)

The way of giving antibiotic to patient depends on many factors like:

- the nature of antibiotic,
- the nature of illness,
- the condition of the patient and
- other external circumstances.

One must take into consideration the irritability and sensitivity against antibiotics when given by certain way.

Ex. Penicillin V can only be given orally (good absorbed by intestine) .

Ex. Gentamycin is not absorbed and must be given by injection.

Ex. Other antibiotics like neomycin, paromomycin and nystatin are somewhat toxic and the only way to use it is by local administration.