

(1)

Name Hazrat OMER

ID 13919

Subject: Pharmacology I

Programme BSc Radiology

Submitted to Nadra Khalij

Date 22 August 2020

(2)

"Section B"

Question no # 1

Ans # 01

Route of drug administration:-

Route of drug administration can be define as "The path by which the drug is taken into the body."

Explanation:-

Various route can be use for the drug administration in the patient considering the state of patient i.e (conscious or un-conscious) bioavailability of the drug, stability of the drug and dissolution and disintegration of the drug and the site of action for the drug. various route of drug administration are given below

**A) Enteral route:-**

it is further divided into oral and sublingual route.

**B) Parenteral:-**

its include

- 1) intravenous
- 2) Intramuscular
- and 3) Subcutaneous.

**C) Other route:-** of drug administration are:-

- 1) Rectal
- 2) Transdermal
- 3) intranasal
- 4) Topical
- 5) Inhalation
- 6) Intra-thecal

# Parenterals:-

The route of the drug administration other than enteral. The drug is administered through the injection or catheter by this route. The drug introduced directly across the body barriers into the systemic circulation or vascular tissue.

**Used for :-** This route of drug administration is used for those drug which are poorly absorbed from the Gastro-intestinal track (GIT)

- This route of drug administration is also use for the treatment of Un-Conscious patient. and also use for the condition in which a rapid onset of action is needed.
- This route is also use for those which is not stable in the stomach (acid) environment.
- This route of administration have the highest bioavailability among all the routes of drug administration.
- The pain and infection at the site of injection may occur which limits their use.

## Types of parenterals:-

The parenteral route of drug administration is further

(4)

divided in the following three route i.e

- 1) intravenous
- 2) intramuscular
- 3) subcutaneous

### A) Intravenous (iv) route:-

it is the most common route by which the drug is directly administered in the systemic circulation by injecting in veins.

This route of drug administration is used for those drug which can not absorb orally. This route also avoid the first pass metabolism of drug by liver because it is administered directly in the blood stream and the drug are 100 percent available for action. This route is also used for iv-injection.

### B) Intramuscular (IM) route:-

By this route the drug is administered deep in the muscles.

The aqueous solution of drug is suspended in non-aqueous solution which provide the sustained-release of the drug and hence prolong the action of the drug.

### C) Subcutaneous:-

By using this route the drug is administered into the skin (under skin) i.e insulin for

(5)

diabetic patient can also be administered through the subcutaneous route i.e. by injecting under the skin. The bioavailability of this route is lower than that of IV route. it has less risk than IV route.

**Question NO # 02**

**ANSWER NO # 02**

## "Water Compartment"

Mainly there are two compartments, i.e.

- (1) Extracellular (out of 42L it is 14L) (liters)
- (2) Intracellular (out of 42L it is 28L) (liters)

### Explanation:-

The body is mainly divided into two compartments i.e. intracellular and Extracellular.

When the drug is administered to the body it may be in plasma i.e. intracellular or in Extracellular. means out of plasma.

### Extracellular:-

The drug of low weight which is administered it absorbs from the endothelial and capillary junction but hydrophilic drug can not enter to the cell so that remain in the plasma and in intestinal fluid. So the drug which is about in 20% of body weight which is equal to 14L in 70Kg body.

## Total body water:-

(6)  
The drug of low molecular weight and hydrophilic drug can absorb well and can enter to the cell. This 60% in 70 kg body is 42 liters of total body weight.

Question no # 03  
ANSWER NO # 03

"Part A"

## Drug Elimination:-

The drug Elimination can be define as "The removal of drug from body is called drug Elimination". The amount of drug removed from the body is called drug elimination, and the volume of drug removed from the body is called drug excretion.

## Routes of drug Elimination:-

There are different route of drug Elimination from the body which is given below:  
(A) Kidney (B) bile (C) saliva (D) sweat  
Sweeting process (E) lung (F) milk in nursing mother (G) intestine.

## Renal Elimination:-

it is the most important route of drug Elimination. Most of the drug

(7)

Eliminate from the body in the form of urine through kidney.

Eliminate the drug from the body through the

flow: following processes.

- 1) Glomerular filtration
- 2) Proximal tubular secretion
- 3) Distal tubular secretion.

## Glomerular filtration:-

Bowman's capsule space as a part of glomerular filtration. The drug exerts through the pressure some of the drug pass through it especially small size drug and hydrophobic drug.

## Proximal tubular secretion:-

Secretion primarily occur in the proximal tubules by two energy requiring active transport system. i.e anions secretion and the other for cations secretion.

## Distal tubular reabsorption:-

The drug if uncharged may diffuse out of the nephric lumen and get back into the systemic circulation.

Manipulating the pH of urine can increase the elimination of the drug and can stop the reabsorption of the drug. i.e weak acid can be eliminated

(8)

by alkalization of urine.  
and elimination of weak  
base can be increased by  
acidification of urine.

Question no #3  
Answer NO #03

"Part B"

"Total Body clearance:-

Body clearance can be define as "Total  
The sum of drug elimination  
through various drug-metabolizing and  
drug-eliminating organs"

Or  
Getting free the body from the  
drug is called body clearance.

Explanation:-

The total body  
clearance means "the sum of drug  
eliminated through the various routes  
like renal, hepatic, pulmonary etc."

Formula:-

This formula for measuring  
the total body clearance is given  
bellow.

$$Cl_{total} = K_e V_d$$

$K_e$  = constant

$V_d$  = volume of distribution.