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Subject pharma I

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Qno 1:- Enumerate various routes of drug administration. Explain parenteral routes in details.

- Routes of drugs administration:-

(A) Enteral

(B) parenteral

(C) other

- parenteral The parenteral route is any route that is not enteral (par- + enteral)

parenteral administration can be performed by injection, that is, using a needle (usually a hypodermic needle) and a syringe or by the insertion of an indwelling catheter

parenteral administran Include.

- Central nervous System.
  - epidural (synonym: peridural) injection or infusion into the epidural Space) e.g epidural anesthesia.

- Intracerebral (into the cerebrum) administration by direct injection into the brain used in experimental research of chemicals and as a treatment of malignancies of the brain. The Intracerebral route can also interrupt the blood brain barier from holding up against subsequent routes.

- Intracerebroventricular (into the cerebral ventricles) administration into the ventricular system of the brain. one use is as a last line of opioid treatment for terminal cancer patient with intratable cancer pain.

- epicutaneous (application onto the skin) it can be used both for local effect as in alargy testing and typical local anesthesia, as well as systemic effects when the active substance diffuses through skin in a transdemal route.

- Sublingual and buccal medication administration is a way of giving someone medicine orally (by mouth) Sublingual administration is when medication is placed under the toung to be absorbed by the body. the word Sublingual means under the tongue Buccal administration involves placement of the drug between the gums and the cheek. These medication

can come in the form of tablets, films or sprays. many drugs are designed for Sublingual administration including Cardiovascular drugs, Steroids, barbiturates, opioid analgesics with poor gastrointestinal bioavailality, enzymes and Increassingly, vitamins and minrals.

- Extra-amniotic administration. between the the endometrium and fetal membrances.

- Nasal admintration (through the nose) can be used for topically acting substance, as well as for Insufflation of e.g ~~through~~ decongestent nasal sprays to be taken up along the respiratory track such as substance are also called Inhalational e.g Inhalational anesthetic.

- Intra-arterial (into an artery) e.g vasodilator drugs in the treatment of vasospasm and thrombolytic drugs for treatment of embalism

- Intra articular, Into a joint space, it is generally performed by joint Injection, it is mainly used for symptomatic relief in osteoarthritis.

- Intra cardiac (into the heart) e.g adrenaline drug in Cardio pulmonary resuscitation (no longer commonly performed)
- Intracavernous Injection, an injection into the base of the penis.
- Intradermal (into the skin itself) is used for skin testing some allergens, and also for mantoux test for tuberculosis.
- Intralesional (into the skin lesion) is used for local skin lesions e.g acne medication.
- Intramuscular (into a muscle) e.g many vaccines antibiotics and long term psychoactive agents Recreationally the colloquial term muscling is used.
- Intraocular, into the eye e.g some medication for glaucoma or eye ~~me~~ neoplasms.
- Intraosseus infusion (into the bone marrow) is in affect an indirect intravenous access because the bone marrow drains directly into the venous system This route is occasionally used for drugs and fluids in emergency medicine and pediatrics when Intravenous access is difficult.

- Intraperitoneal. (infusion or injection into the peritoenum) e.g peritoneal dialysis.
- Intrathecal (into the Spinal canal) is most Commonly used for spinal anesthesia and Chemotherpy.
- Intrauterine.
- Intravaginal administration in the vagina.
- Intravenous (into a vein) e.g many drugs, total parenteral nutrition.
- Intravesical Infusion is into the urinary bladder
- Intravitreal through the eye.

Qno 2:- What does water Compartment meant. Explain its types in details.

= The human body and even it individual body fluids may be conceptually divided in to various fluid Compartment, which although not literally anatomic Compartments do represent a real division in terms of how portion of the body water, and solutes Suspended elements are segregated - the two main fluid Compartment are the Intracellular and extracellular Compartment. The Intracellular Compartment in the Space within the organism Cells it is Separated from the extracellular Compartment by Cell membranes. -

About two third of the ~~total~~ total body water of human in held in the Cells mostly in the Cytosol and the remainder is found in the extracellar Compartment. The extracellular fluids may be divided in tow three types Interstitial fluid in the the interstitial Compartment (inside the ~~blood vessels and lymphatic vessels~~) (Sorrunding tissue cells and bathing them in a Solution of nutrients and other chemicals)

Blood plasma and lymph in the Intravascular Compartment (Inside ~~trancellular Compartment~~)
~~The Interstitial~~ (The the blood vessels and laymhatic vessels and small amount of transcellular fluid Such as ocular and cerebrospinal fluids in the Compartment the transcellular. The Intestitial and intravascular Compatment readily exchang water and salute but the third extracellular Compartment, the transcellular, it is thought of as separate from the other two and not in dynamic equibrium with them.

Types~

1. Intracellular Compartment
2. Extracellular Compartment

   2.1 Intravascular Compartment
   2.2 Interstitial Compartment
   2.3 Transcellular Compartment

(3) (1) Intracellular Compartment:-

~~3.1~~ The Intracellular fluid, also known as cytosal, is a fluid contained inside the cells. it is the matrix in which cellular organells are Suspended. The cytosol and organeiles togather Compose the cytoplasm The cell membranes are the outer barrier

In humans, the Intracellular Compartment contains moderate quantities of magnesium and Sulphate ions.
In the cell nucleus the fluid component of the nucleoplasm is called the nucleosal.

(1) Extracellular Compartment:- The Interstitial Intravascular and transcellular Compartment comprise the extracellular Compartment. it is extracellular fluid (ECF) Contains about one-third of total body water.

(2.1) Intravascular Compartment:- The main Intravascular fluid in mamonals is blood a Complex mixture with elements of Suspention (blood cells) Colloid (globulins) and Solutes (glucose and ions) The blood represents both the Intracellular Compartment (the fluid inside the blood cells) and the extracellular Compartment (the blood plasma) the average volume of plasma in the average (70 kg) male is approximately 3.5 liters the valume of the intravascular Compartment is regulated in part by hydrostatic pressure gardients, and by reabsoption by the kedneys.

2.2:- Interstitial Compartment:- also called tissue Space) Surrounds tissue cell. it is filed with Interstitial Fluid, Including lymph Interstitial Fluid provides the Immediate microenvironment that alows for movement of Ions protens and across the cell barier This Fluid is not static, but is continually being refreshed by the blood capillaries and recollected by lymphatic capillaries in the average male (70 kg) human body, the Intestitial spase has aproximtely 10.5 lifers of fluid.

2.3 :— Trancellular Compartment:— The third extracellular compartment, the transcelldular, consist of those spaces in the body where fluid does not normaly collect in larger amounts or where any significint fluid collection is physiologically nonfunctional.

Q no 3(1) What are drug elimination stages. Explain briefly.

Drugs eliminination :- Drugs eliminination is the process by which phamaceutical Substances are removed from the body. All drugs are eventually eliminated from the body although there are various pathways that may be Involved in the process. Some drugs undergo metabalism before being excreted, whereas other drugs are largely eliminated intact in the orignal dosage form.

The kidneys are responsible for the majority of excretion of water-Soluble Substance. The biliary System can also excrete drugs that are not reabsorbed from the gastrointestinal track

In most cases, the amount of excreted drugs in the intestine, Saliva, Sweat, breast milk and lungs is neglible. Hower, Some volatile anesthetics Can be exhaled via the lungs also even Small drugs Concentration in breast milk of lactating women may effect a breastfeedin infant.

Renal elimination of drugs.

- Glomerular filtration
- proximal tubular Secretion
- Distal tubular reabsorption.

Glomerular filtration :- Unless things go wrongs, most of us don't spend much time thinking about what it takes to urinate. but in fact your kedney and urinary system are quite amazing togather they recieive over a liter of blood each minute and eliminte around 1.5 liters of urine per day. efficiently gelling rid of exess water and waste products that would otherwise cause you some serious perblem.

Glomerular filtration is the first step in making urine. it is process that your kedneys use to filter & excess fluid and waste products out of the blood into the urine collecting tubules of the kidney, So they may be eliminated from your body.

proximal tubular Secretion:- is anactive process, requiring synchronized trasnsport and energy. whereas glomerular filtration is passive, Second, postglomerular blood flow from one glomerulus may be directed to other proximal tubules.

Distal tubular reabsorption:- A drugs move toward the distal convaluted tubule it concentration increases and exceeds that of the perivascular space the drugs if uncharged may diffuse out of the nephric lumen back into the systemic circulation ~Manipulating the pH of the urine to increase the ionized form of the drug in the lumen may be used to minimize the amount of back diffucion and hence, increase the clearance of an undesirab drug. As a general rule weak acids of the urine whereas elimination of weak bases may be increased by acidification of the urine.

Q no 3 part 2 - What does total body clearance means.

In pharmacology, clearance is a pharmacokinetic measurement of the volume of plasma fl from which a substance is completely removed per unit time.

Thus, total body clearance is equal to the sum clearance of the substance by each organ.