



Posology I

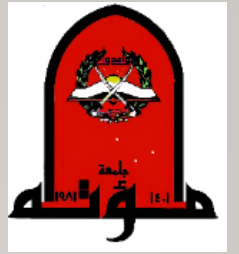
By

Dr. Lamiaa Meghawery

**Associate professor of pharmacology
FACULTY OF DENTISTRY
Mutah university**



ILOS

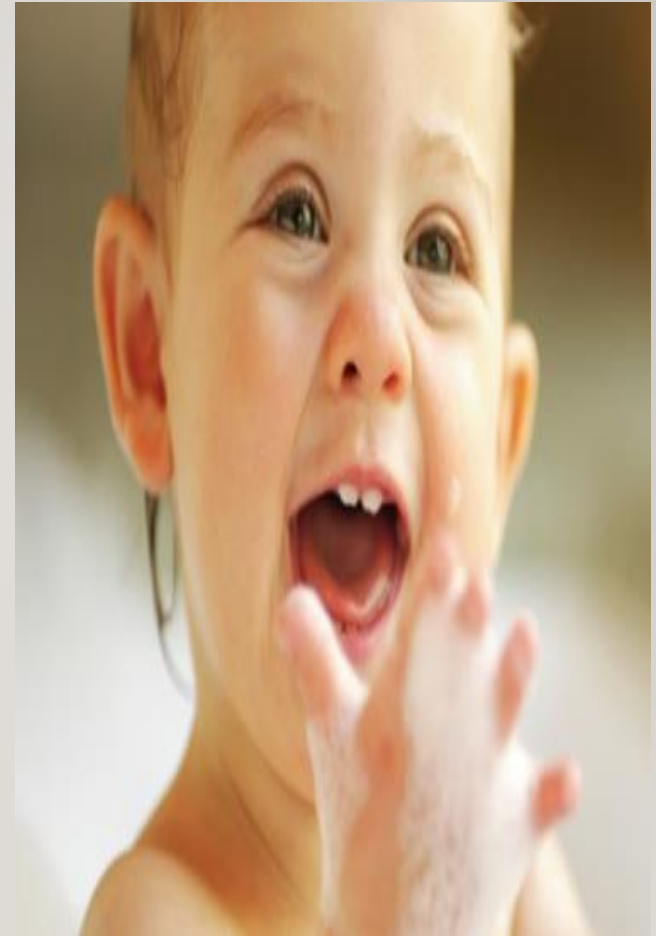


-
- Recognize the clinical importance of factors affecting drug dosing.
 - Rationalize importance of pharmacodynamic changes in geriatrics.
 - Identify factors affecting drug dosing in pediatrics.

Factors modifying dosage and action of drugs

1) Age:

Newborn infants especially **premature** are more susceptible to drugs .



Kinetics in pediatrics

Low level of HCL → ↓ absorption of weak acids

Topical absorption → greater systemic effects

Corticosteroid ointment

Low plasma proteins

Low binding capacity

Immaturity of blood brain barrier.

Underdevelopment of microsomal enzymes

Reduced excretory function

Dose Calculation in pediatrics

Infant < 2 y dose =
adult dose x infant **surface area** / 1.73

Clark's rule:

$$\text{Infant dose} = \frac{\text{Weight (kg} \times 2.2) \times \text{Adult dose}}{150}$$

Dose Calculation in pediatrics

Young's rule:

$$\text{Child dose} = \frac{\text{Age (year)} \times \text{Adult dose}}{\text{Age(year)}+12}$$

Dose Calculation (Continued)

Percentage method:

As % of adult dose according to age

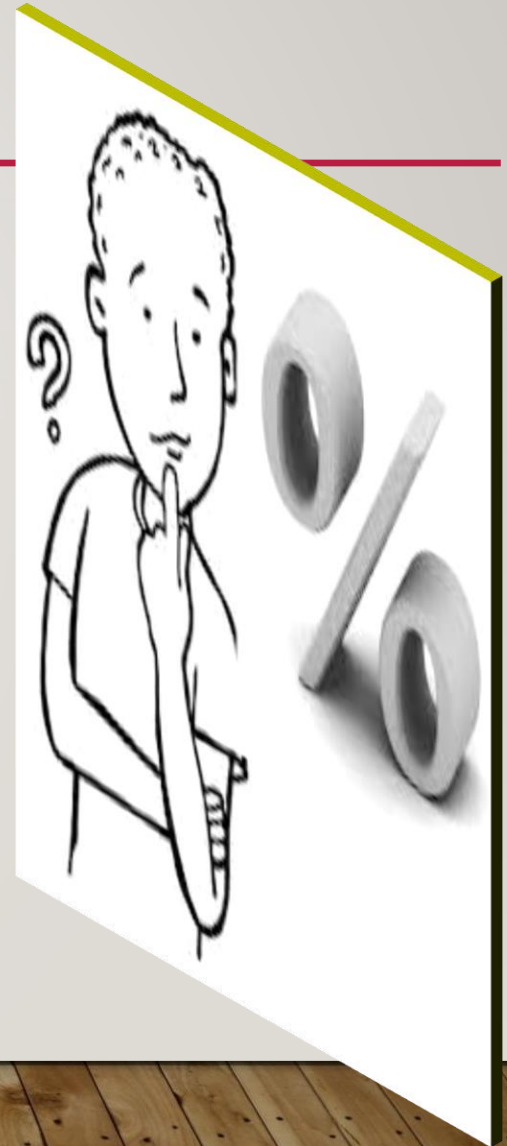
1 month → 10%

1 year → 25%

3 years → 33%

7 years → 50%

12 years → 75%



Factors modifying dosage and action of drugs

1) Age:

Geriatrics:



Pharmacokinetics Changes in elderly

Absorption

Distribution

Metabolism

Excretion



Absorption in elderly



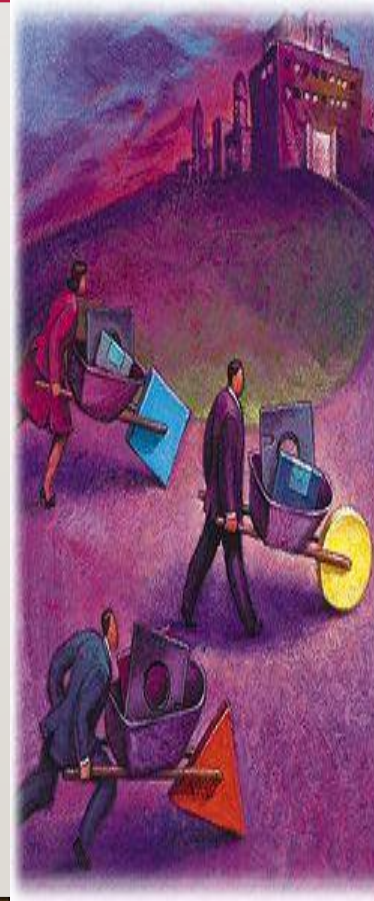
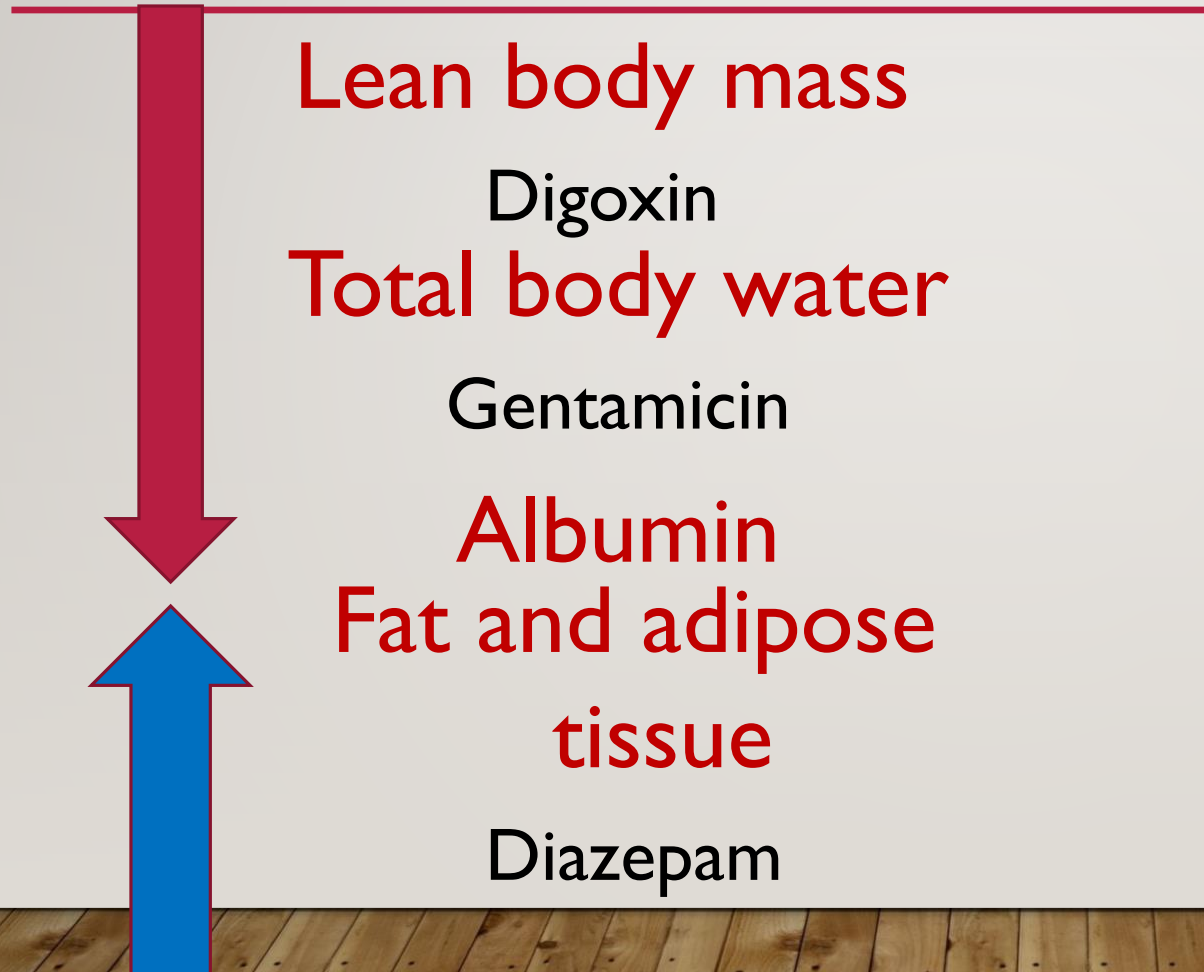
- ❑ Gastric acidity

Itraconazole, phenytoin

- ❑ Gut motility and gastric emptying.

- ❑ Active transport of some agents
Iron & Vitamin B12

Distribution in elderly



Distribution

Metabolism in elderly

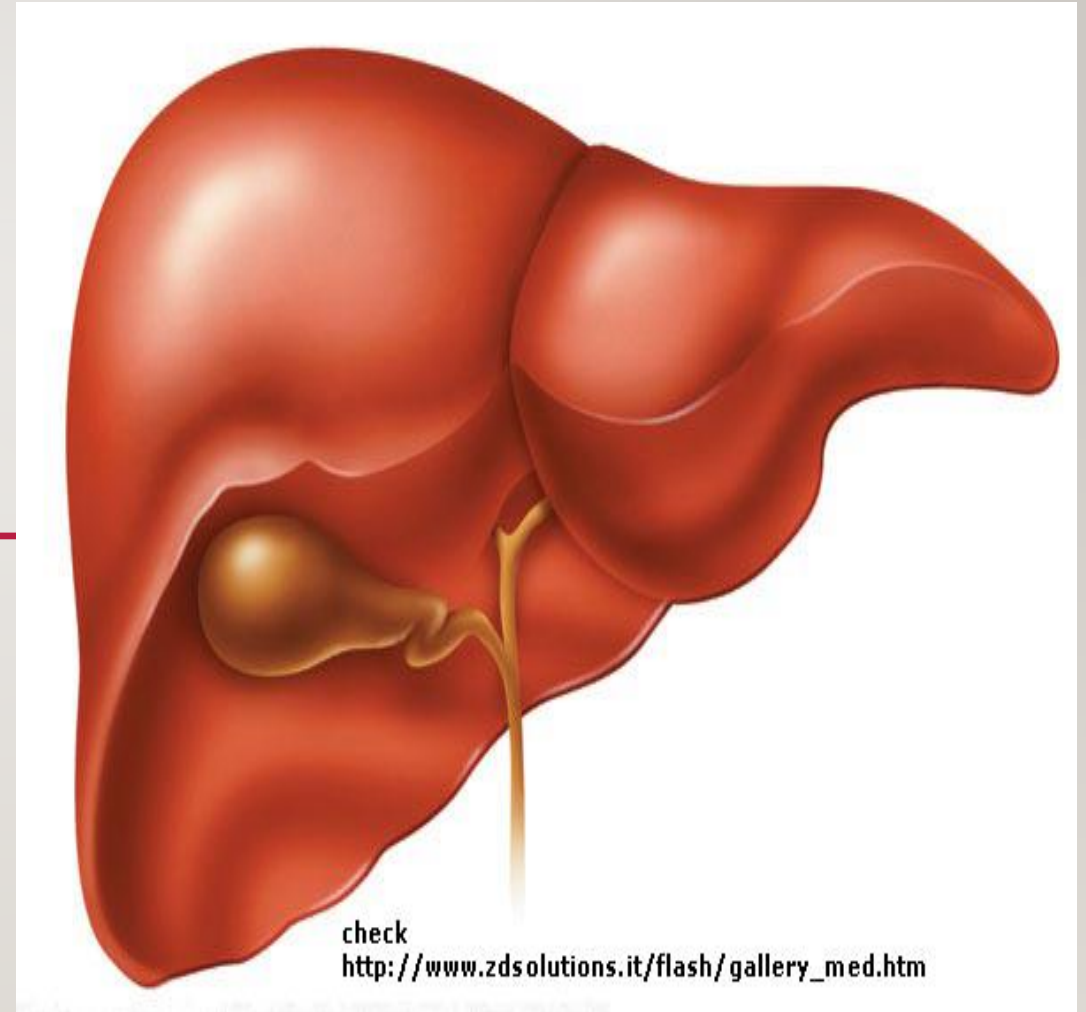
***Elderly have up to 40% reduction in hepatic blood flow**

Propranolol - Morphine

***HME activity is reduced**

NSAIDs

Anticonvulsants



Excretion in elderly

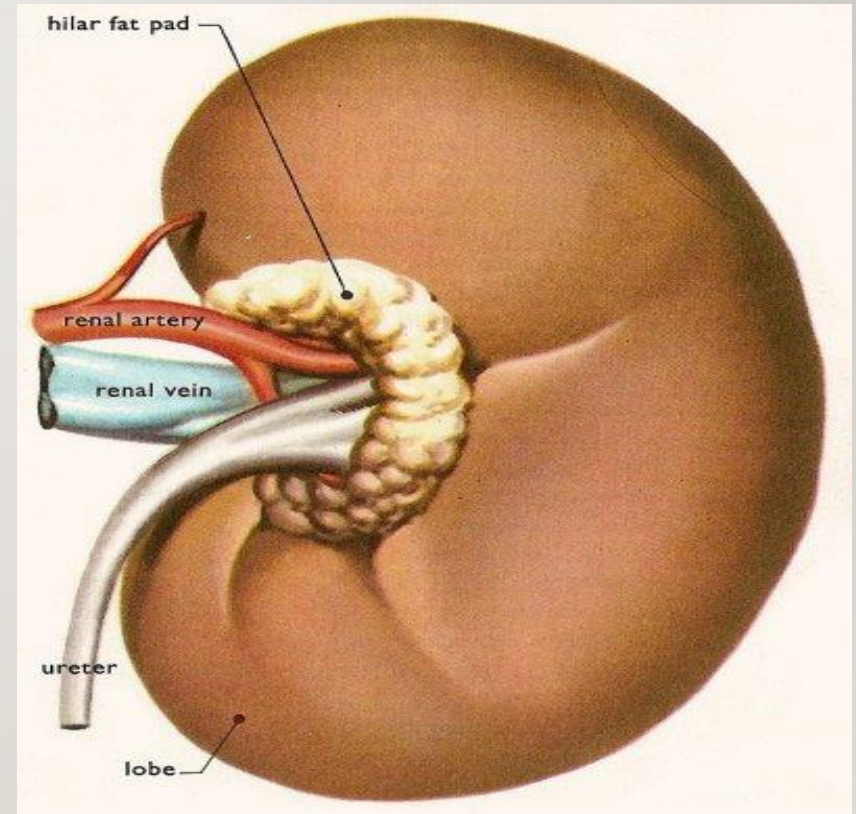
GFR declines with age
(↓50% at 75 y)

So calculate

Creatinine clearance
for any renally cleared drugs

as

**Aminoglycosides
& Vancomycin**



Pharmacodynamics Changes

Change in drug receptor interaction:

Decrease response to beta receptor agonist and antagonist.

Increased frequency of postural hypotension
due to Blunting of reflex tachycardia.

Sensitivity to CNS depressants is increased lead to confusion.
Benzodiazepines

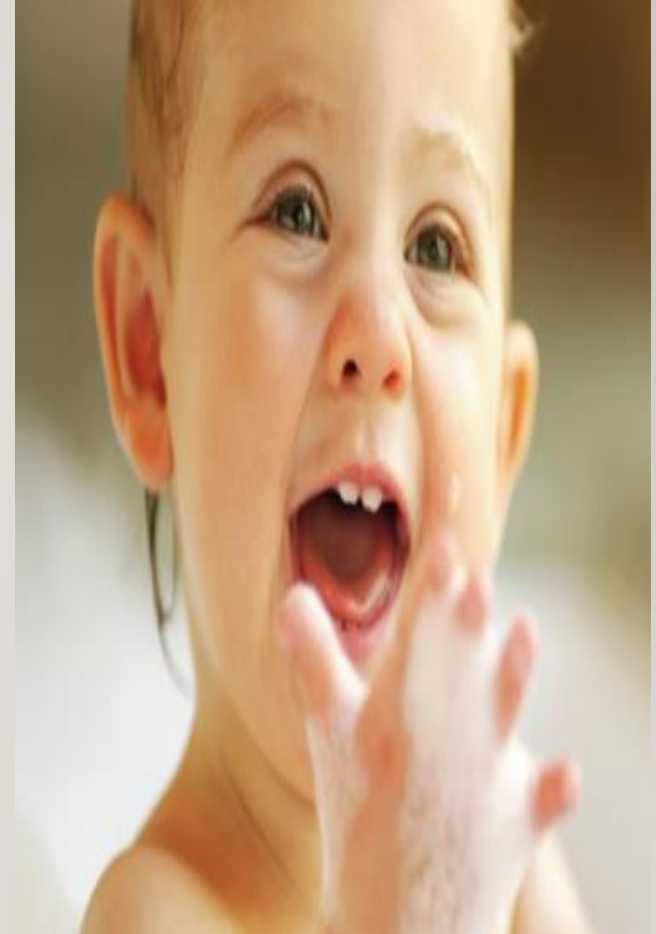
CONCLUSIONS

- Use $\frac{3}{4}$ in geriatrics patients over 60 years.
- Use $\frac{2}{3}$ the dose in geriatrics patients over 70 years.

Factors modifying dosage and action of drugs

2-Body weight & Surface area:

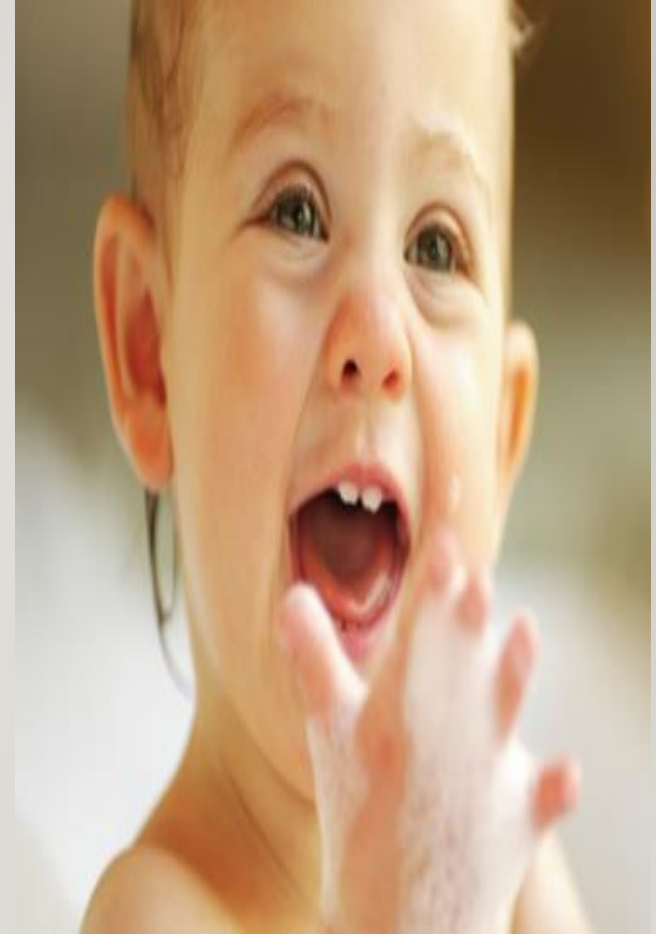
- The dose is calculated usually according to **lean body weight** for adults between **20-60** years weighing about **70 Kg**.
- **However**, increase in body weight due to **obesity** or **edema** should not be taken into consideration as fat is inert tissue.



Factors modifying dosage and action of drugs

2-Body weight & Surface area:

- **Body surface area (BSA)** is **more accurate** in calculating doses for children & infants.
- **Adult body surface area=1.73 m²**
- **Child dose=Adult dose X Child surface area/1.73**



Factors modifying dosage and action of drugs

3-Sex: ♂ ♀

- **Females** need **smaller dose** than males due to fat content and enzyme **inhibiting** effect of **female sex hormones** and **inducing** effect of **male sex hormone**.
- During **menstruation**
Avoid salicylates and castor oil.
- During **pregnancy**
Avoid teratogenic drugs, and uterine stimulants.
- During **lactation**

Factors modifying dosage and action of drugs

4) Route of administration:

- ❑ **I.V, sublingual and inhalation** need **small dose** than oral.
- ❑ **S.C. and I.M. are larger than I.V.** but less than oral.
- ❑ **Magnesium sulphate** **orally** is purgative, **rectally** is dehydrating agent, and **I.V.** it is anticonvulsants and antagonizes Ca^{++} .

Factors modifying dosage and action of drugs

5) Super sensitivity (Drugs intolerance):

Exaggerated action to **normal** dose of a drug

- May be due to **decrease clearance** of drug or **upregulation of receptors**.
- **Example:** Hyperthyroidism → Supersensitivity to sympathomimetics. **Treated by decrease the dose of the drug.**

QUESTIONS

1. The rate of absorption of a drug in pediatrics is affected by all of the following

EXCEPT:

- (a) Route of drug administration
- (b) Solubility of the drug
- (c) Skin thickness
- (d) Distribution of drug

2. What is super sensitivity and its significance?

3. Which of the following is the best in dose calculation:

- (a) Body weight
- (b) Surface area
- (c) Percentage method





Thank You

