SNS COLLEGE OF NURSING, COIMBATORE- 35

Department : Department of Nursing

Course Name : B. Sc. (Nursing) I Year II Semester

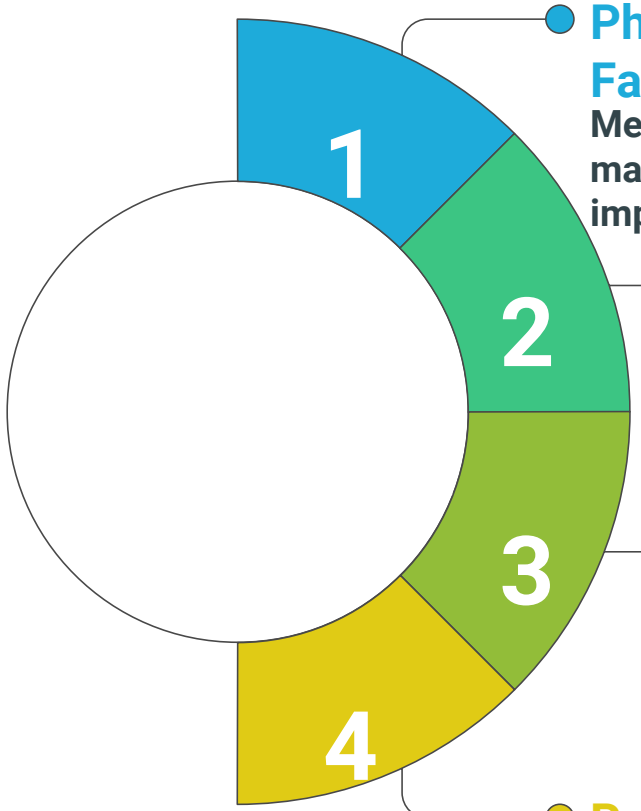
Subject : Nursing Foundation- II

Unit : IX

Topic : Administration of Medications-

Factors influencing Medication A

Introduction



Pharmaceutical Factors

Medication formulation and manufacturing processes impact action.

Pharmacokinetic Factors

Drug absorption, distribution, metabolism, and excretion processes.

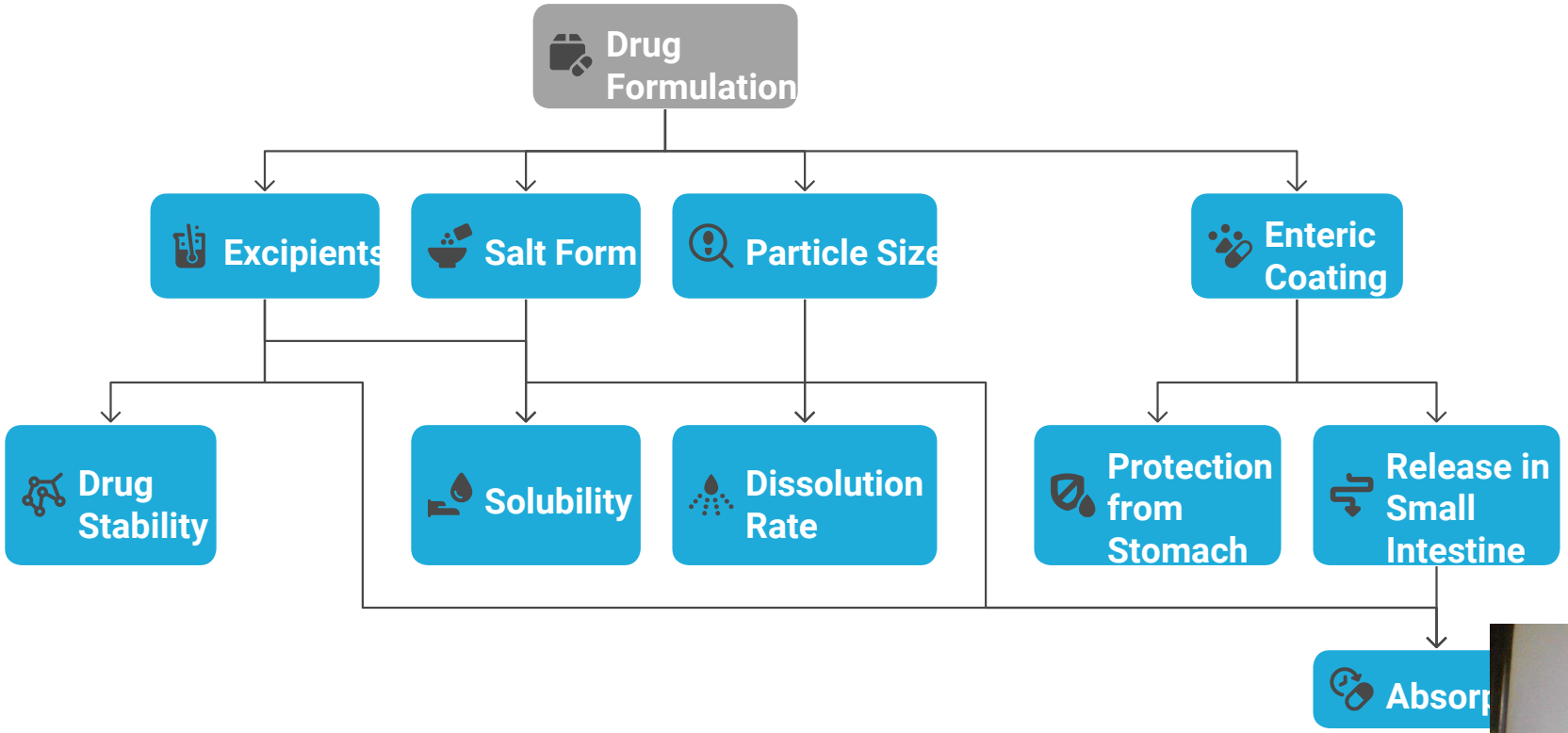
Pharmacodynamic Factors

Drug interaction with receptors and cellular mechanisms.

Patient-Related Factors

Individual patient characteristics affecting medication response.

1. Pharmaceutical Factors- Drug Foumulation



- Route of drug administration

Which route of administration should be chosen for optimal drug absorption?

Intravenous

Immediate and complete bioavailability, bypassing absorption

Intramuscular/ Subcutaneous

Absorption rates vary based on blood flow

Oral

Subject to first-pass metabolism, reducing bioavailability

Topical

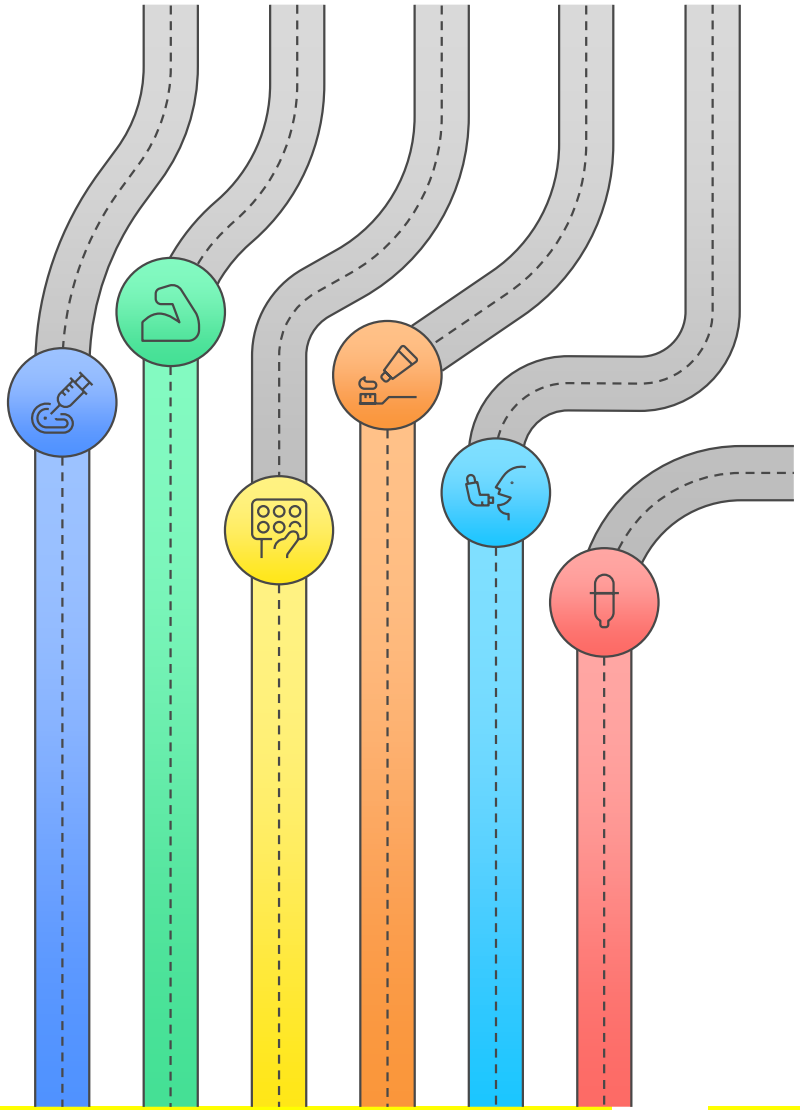
Absorption depends on skin condition and formulation

Inhalation

Rapid absorption through the lungs

Rectal

Erratic and incomplete absorption



2. Pharmacokinetic Factors- Absorption

GI Motility

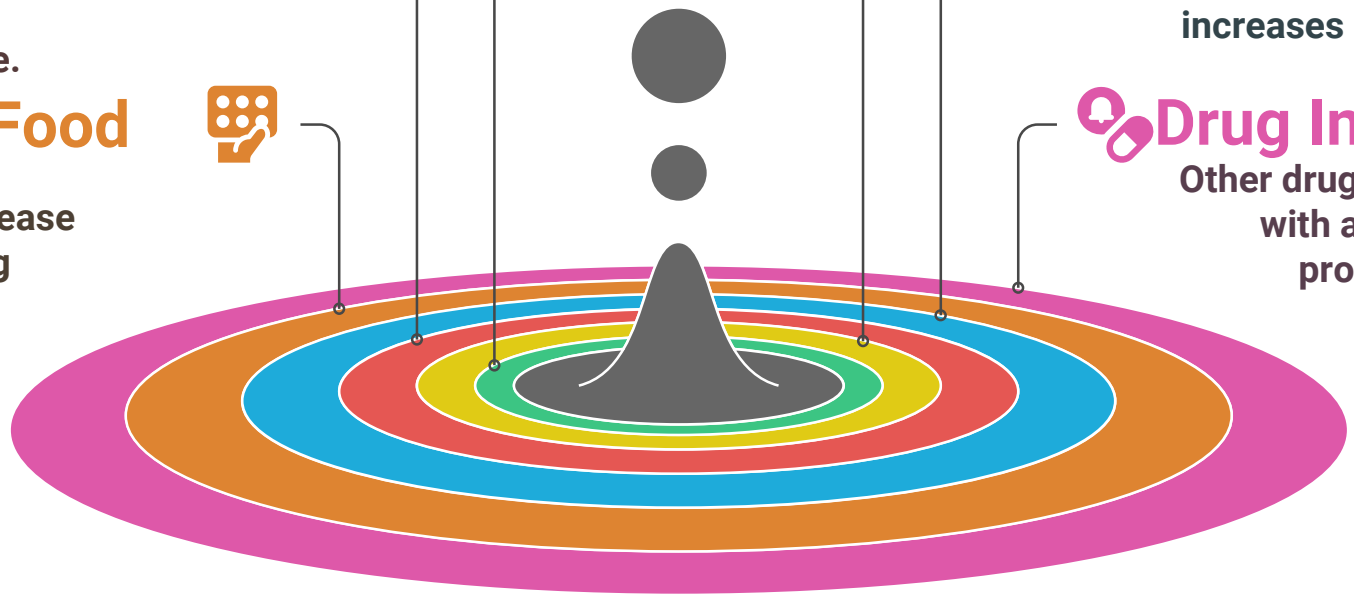
The rate of stomach emptying and intestinal movement influences absorption.

Blood Flow

Increased blood flow enhances drug absorption at the site.

Presence of Food

Food can either increase or decrease drug absorption.



GI pH

The acidity or alkalinity of the GI tract affects drug ionization and solubility.

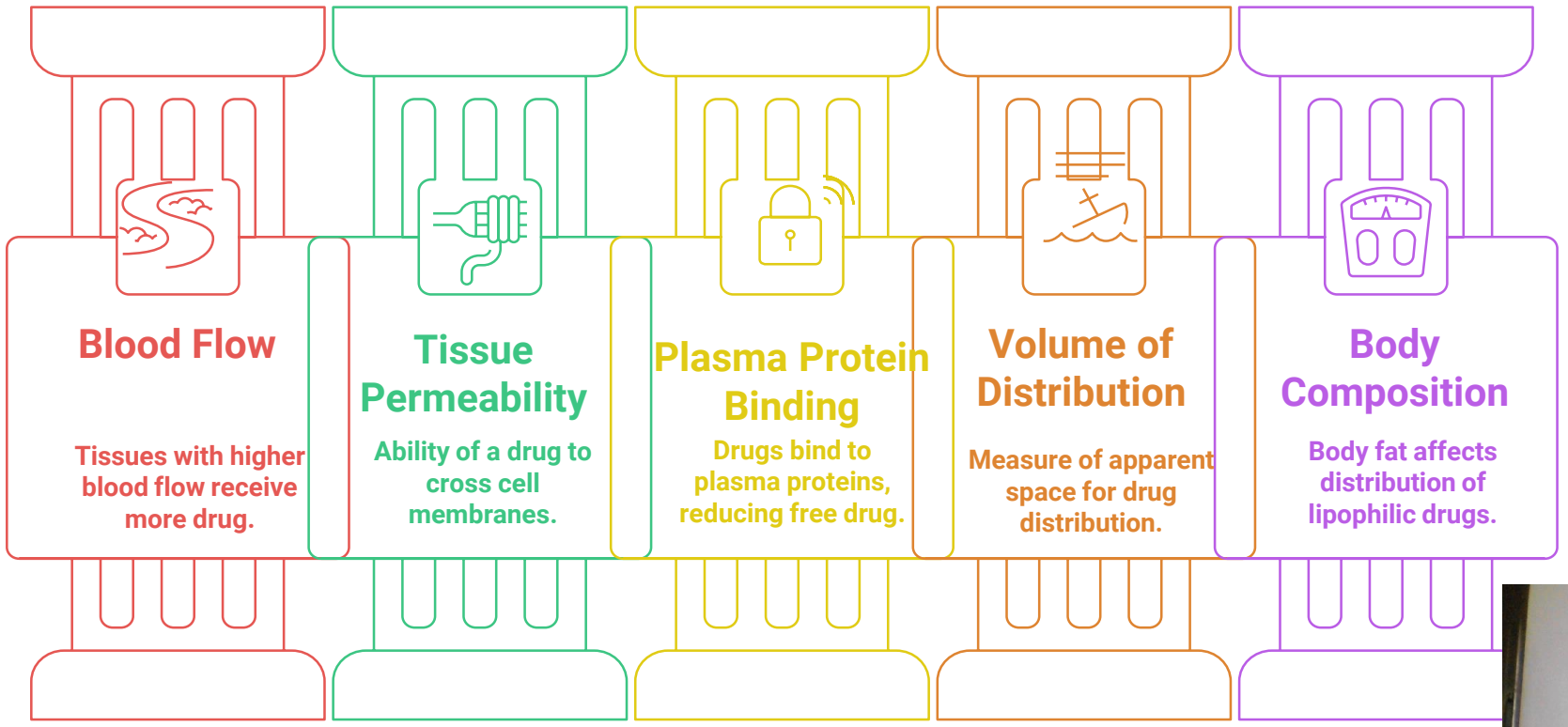
Surface Area

Larger surface area in the small intestine increases absorption.

Drug Interactions

Other drugs can interfere with absorption processes.

- Distribution



Metabolism (Biotransformation)

Drug Enters Body

The drug is ingested or administered.

Drug Reaches Liver

The drug travels to the liver for processing.

Liver Enzymes Act

CYP enzymes metabolize the drug.

Enzyme Induction

Some drugs increase CYP enzyme activity.

Enzyme Inhibition

Some drugs decrease CYP enzyme activity.

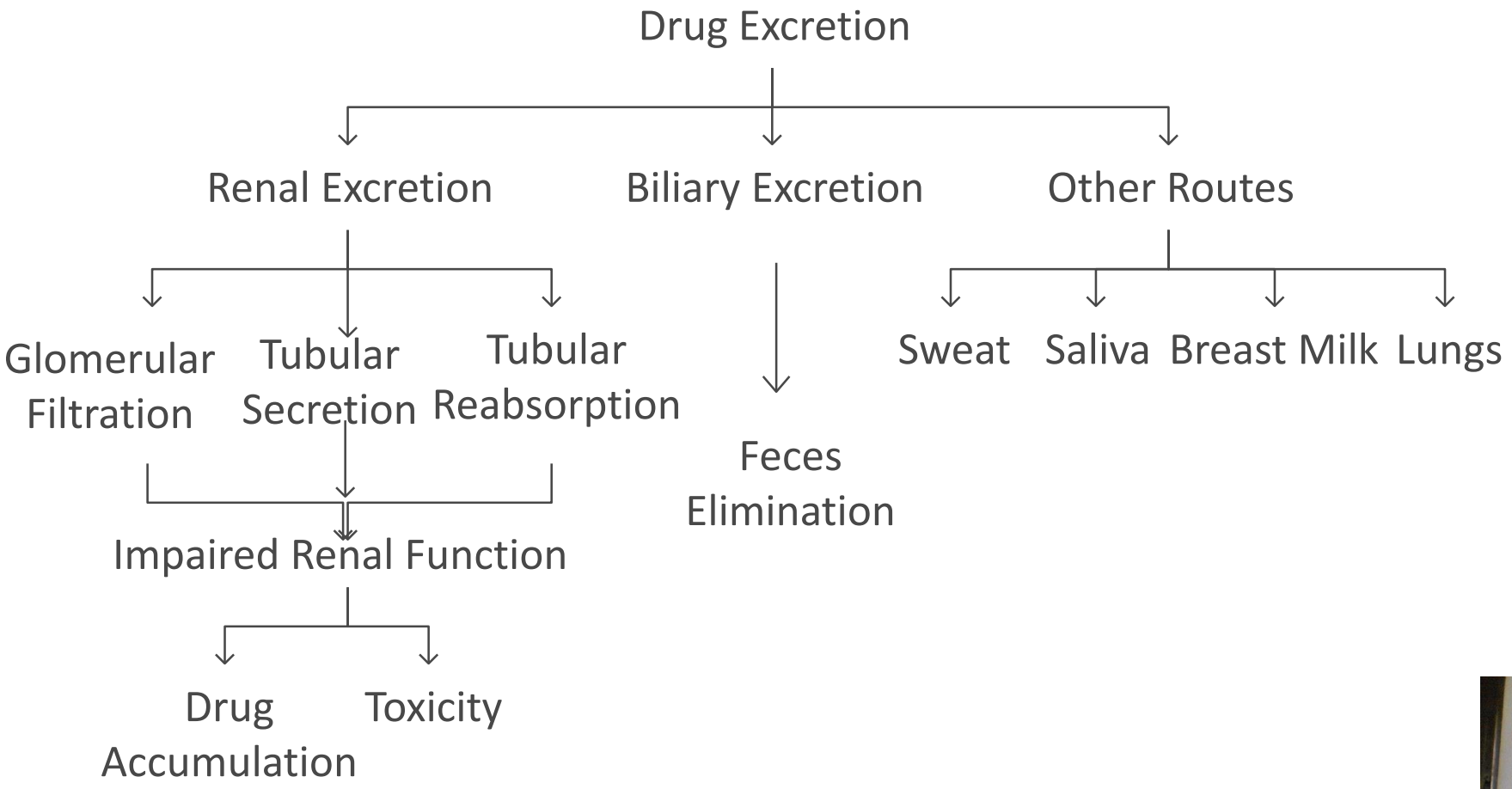
First-Pass Metabolism

Drug is metabolized before systemic circulation.

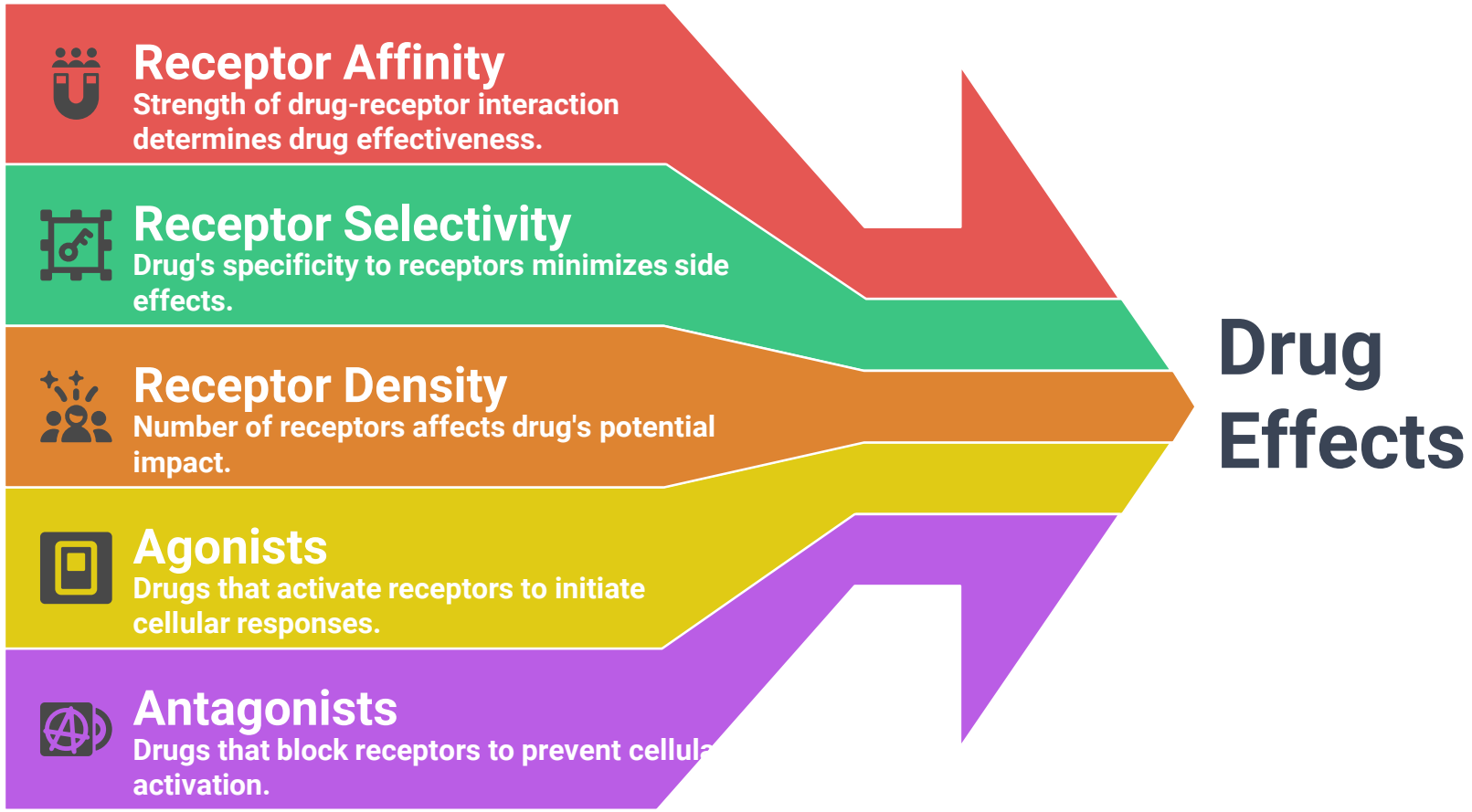
Genetic Polymorphisms

Genetic variations affect metabolism rates.

- Excretion


Drug Excretion
Renal Excretion
Biliary Excretion
Other Routes
Glomerular Filtration
Tubular Secretion
Tubular Reabsorption
Feces Elimination
Sweat
Saliva
Breast Milk
Lungs
Impaired Renal Function
Drug Accumulation
Toxicity

3. Pharmacodynamic Factors- Receptor Binding



Signal Transduction: The process by which a drug-receptor interaction leads to a cellular response

Drug Interactions at Receptor Level

Enhanced Drug Effect

The drug's effect is amplified due to interaction.

Altered Drug Effect

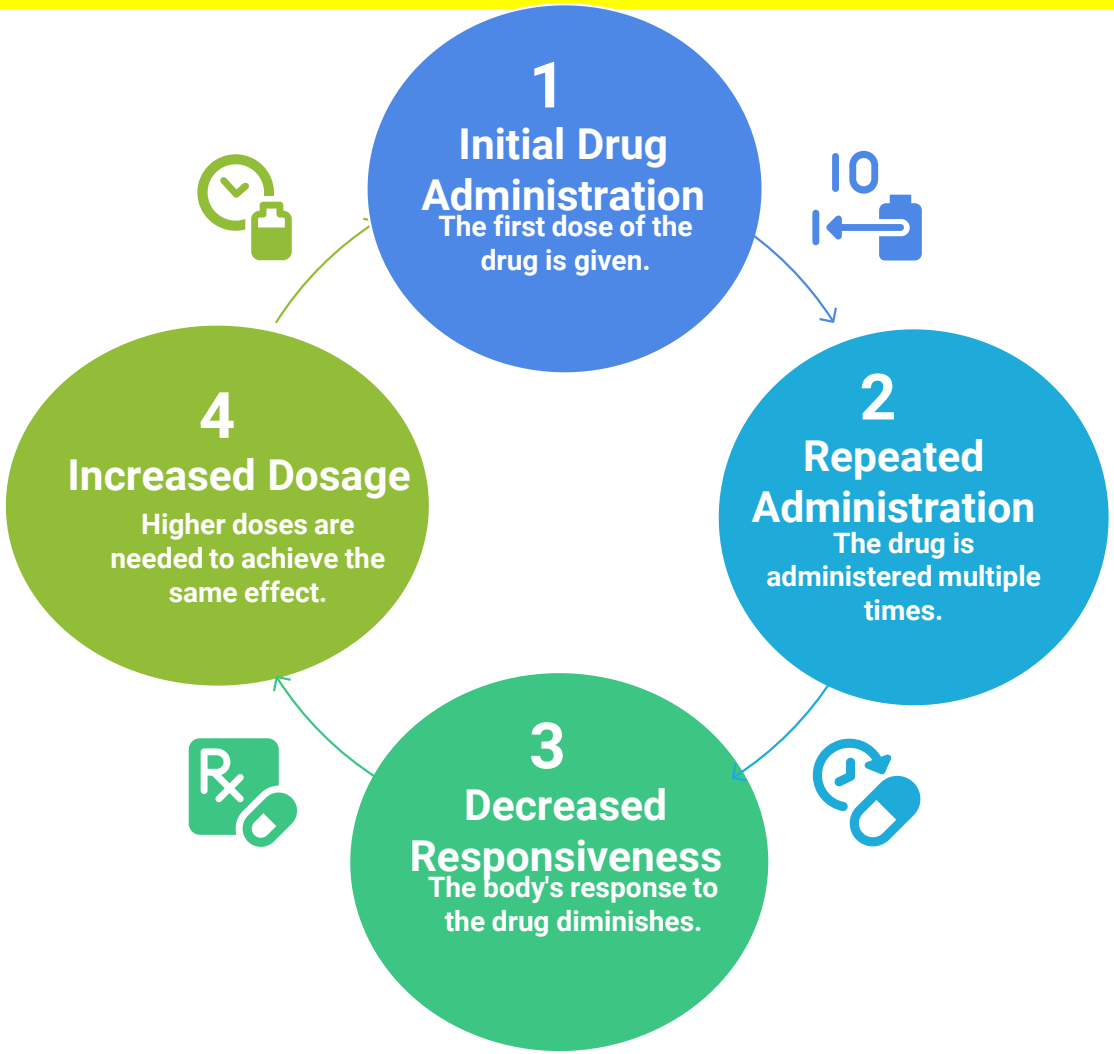
The drug's effect changes due to interaction.

Reduced Drug Effect

The drug's effect is diminished by competition.

- Drug Tolerance

Cycle of Drug Tolerance



- Drug Sensitation

Cycle of Drug Sensitization

Enhanced Effects
The drug's effects are amplified.

Initial Drug Exposure
The first encounter with the drug.

Increased Responsiveness
The body becomes more sensitive to the drug.

Repeated Administration
Continued use of the drug.

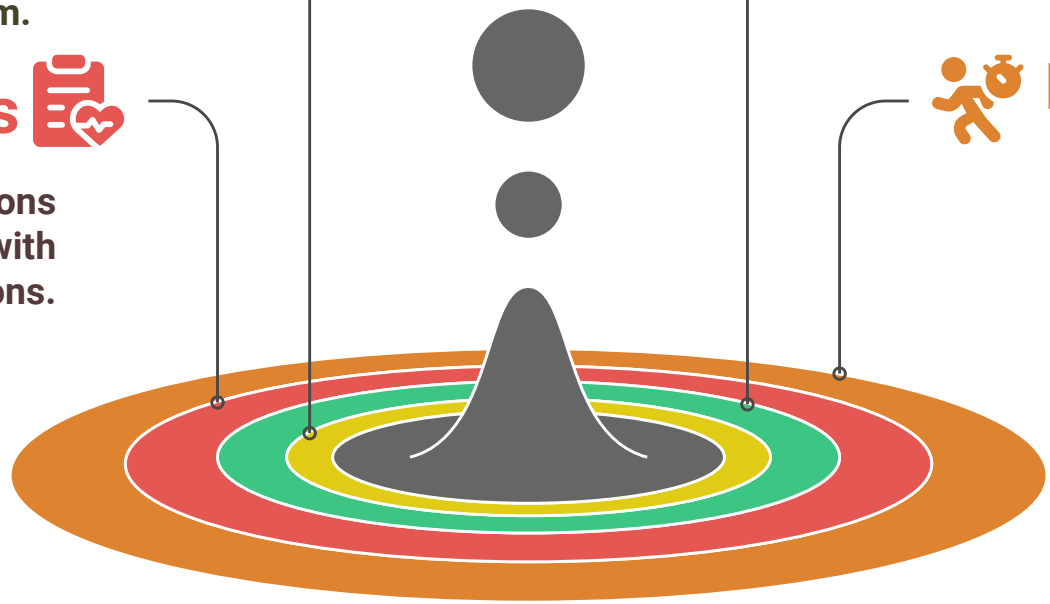
3. Patient-Related Factors Influencing Drug Response

Age

Immature organ systems in neonates and infants affect drug metabolism.

Health Status

Pre-existing conditions can interact with medications.



Genetics

Genetic variations can alter drug metabolism and response.

Lifestyle

Diet, exercise, and habits influence drug effectiveness.

5 Minutes Assessment :

1. **Which factor can slow the absorption of oral medications?**
   A. Empty stomach
   B. Increased blood flow
   C. Presence of food in the stomach
   D. Liquid drug form
2. **2. Why is medication action often prolonged in elderly patients?**
   A. Faster metabolism
   B. Increased kidney function
   C. Decreased liver and kidney function
   D. Increased appetite
3. **3. How does body weight influence medication action?**
   A. Heavier individuals require lower doses
   B. Lighter individuals require higher doses
   C. Dosage may need to be adjusted based on weight
   D. Body weight has no effect on drug action

- **4. Which of the following psychological factors can alter the effectiveness of a medication?**
  A. Route of administration
  B. Patient's emotional state and expectations
  C. Medication brand name
  D. Patient’s weight
- **5. In patients with liver disease, drug metabolism is usually:**
  A. Faster
  B. Normal
  C. Slower
  D. Unchanged

- ☑ Correct Answer: C
- ☑ Correct Answer: C
- ☑ Correct Answer: C
- ☑ Correct Answer: B
- ☑ Correct Answer: C

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Thank you !!!