

# FOOD-DRUG INTERACTION



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# Food-Drug Interaction

- A drug-food interaction occurs when your food or one of its components and medicine interfere with one another. Interactions can happen with both prescription and over-the-counter medicines.
- Not all medicines are affected by food. Some medicines cannot be taken with certain types of food. The food can cause a reaction that changes the effect of the medicine.
- On the other hand, some medicines are easier to handle when taken with food.

# Effects of Food-Drug Interaction

## Drug-Food Interaction



Possible Effects

Decrease Action  
of Drug(s)

Increase Action  
of Drug(s)

Cause Adverse  
Effects

# Foods that may Affects Medication You Taking



Dairy Products



Coffee



Grapefruit Juice



Cokes



Alcohols



Tea



Charcoal-Broiled foods



Green Leafy Vegetables



Licorice



Ginseng



# Effects of Food-Drug Interaction in Absorption

- Drug Formulation influences the rate and extent of drug absorption.
  - a) Food may differentially effect the absorption of different formulation of a single drug. For example,
    - **Granules**: absorption not influence by food intake.
    - **Tablets**: absorption (both) decreased and delayed by food intake.
  - b) When food delays dissolution of solid drug products, drug absorption will also be delayed.
- Foods may influence the bioavailability of drugs by
  - direct binding of drugs to substances in the food
  - by altering luminal pH, gastric emptying and intestinal transit time
  - through mucosal absorption , chemical interactions



# Effects of Food-Drug Interaction in Absorption

- Water-insoluble drugs, such as *spironolactone* and *griseofulvin* are better absorbed when taken directly after a meal.
- The bioavailability of some drugs that are subject to considerable 'first-phase' metabolism is increased by simultaneous food ingestion e.g. Atenolol, metoprolol, labetolol and nitrofurantoin.
- Absorption of iron tablets is enhanced if they are taken with fruit juice, but the tannic acid in tea tends to interfere with iron absorption. Ingestion of food reduces the absorption of aspirin, isoniazid.

**Table 3. Food-Drug Interactions****Drugs with Enhanced Bioavailability by Food***Antimicrobials*

1. Nitrofurantoin
2. Griseofulvin
3. Erythromycin Estolate

*Antihypertensives*

1. B-blockers  
(Propranolol  
Metoprolol)
2. Hydralazine
3. Hydrochlorothiazide
4. Spironolactone

*Anticonvulsants*

1. Phenytoin
2. Carbamazepine

*Other Drugs*

1. Diazepam
2. Lithium
3. Dicoumarol
4. Mebendazole
5. Riboflavin
6. Chloroquine

**Drugs with Reduced Bioavailability by Food***Antimicrobials*

1. Penicillins
2. Tetracyclines
3. Ampicillins
4. Rifampicin
5. Inh
6. Erythromycin stearate

*Other Drugs*

1. Theophylline
2. Methotrexate
3. Levodopa
4. Frusemide
5. Warfarin
6. Captopril

*Analgesics*

1. Aspirin
2. Phenacetin

# Effects of Food-Drug Interaction in Metabolism

- Grapefruit juice mainly inhibits the intestinal metabolism (CYP3A4) of numerous drugs (calcium channel blockers, anti-anxiety agents) enhancing their effects and increasing risk of toxicity; may interfere with the absorption of other drugs. Juice contain Naringenin which inhibits OATP.
- Cruciferous vegetables(cabbage or brussels sprouts) contain Indolic compounds which are inducers of CYP1A2 stimulate the rate of human drug metabolism.
- Rate of drug (*antipyrine* or *theophylline*) elimination (as measured by plasma half-life) was slowest when the high carbohydrate diet was fed and fastest during the high protein period.



# Effects of Food-Drug Interaction in Excretion

- Patients on low sodium diets will reabsorb more lithium along with sodium .
- Patients on high sodium diets will excrete more lithium and need higher doses.
- Some diets, particularly extreme diets, may affect urinary pH , which affects reabsorption of acidic and basic medications.

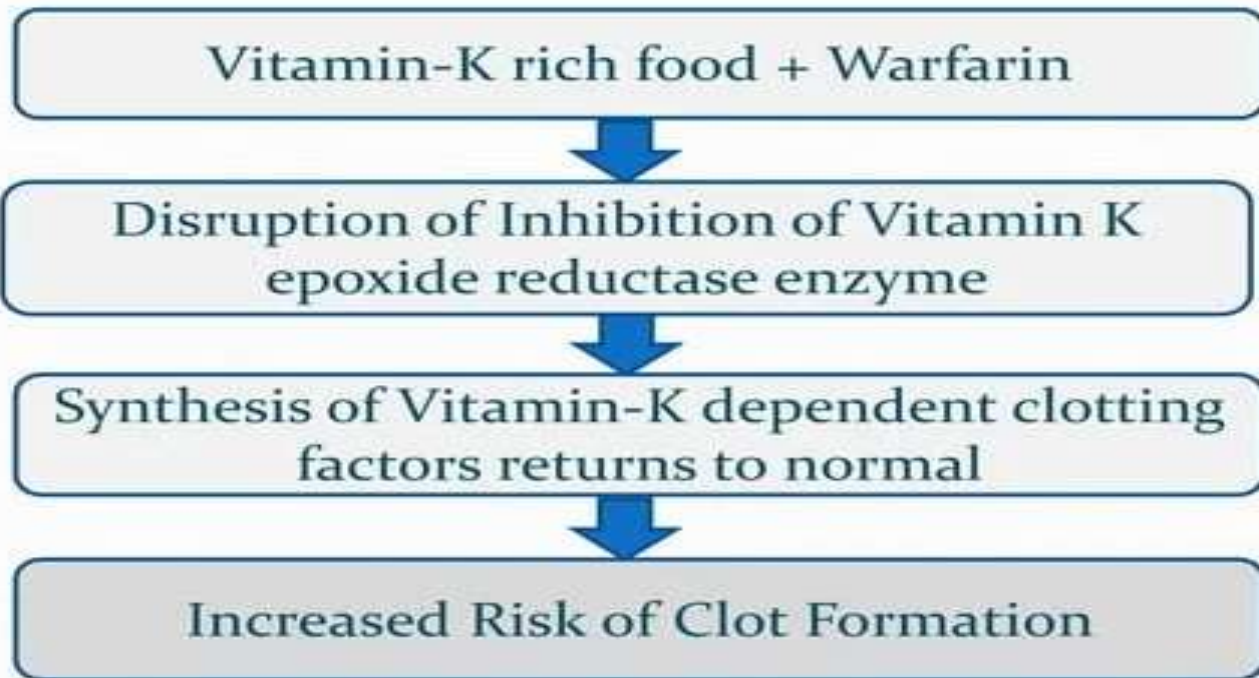
# Mechanism of some Food-Drug Interactions

- Dairy products(butter , milk, cheese, yoghurt etc.)



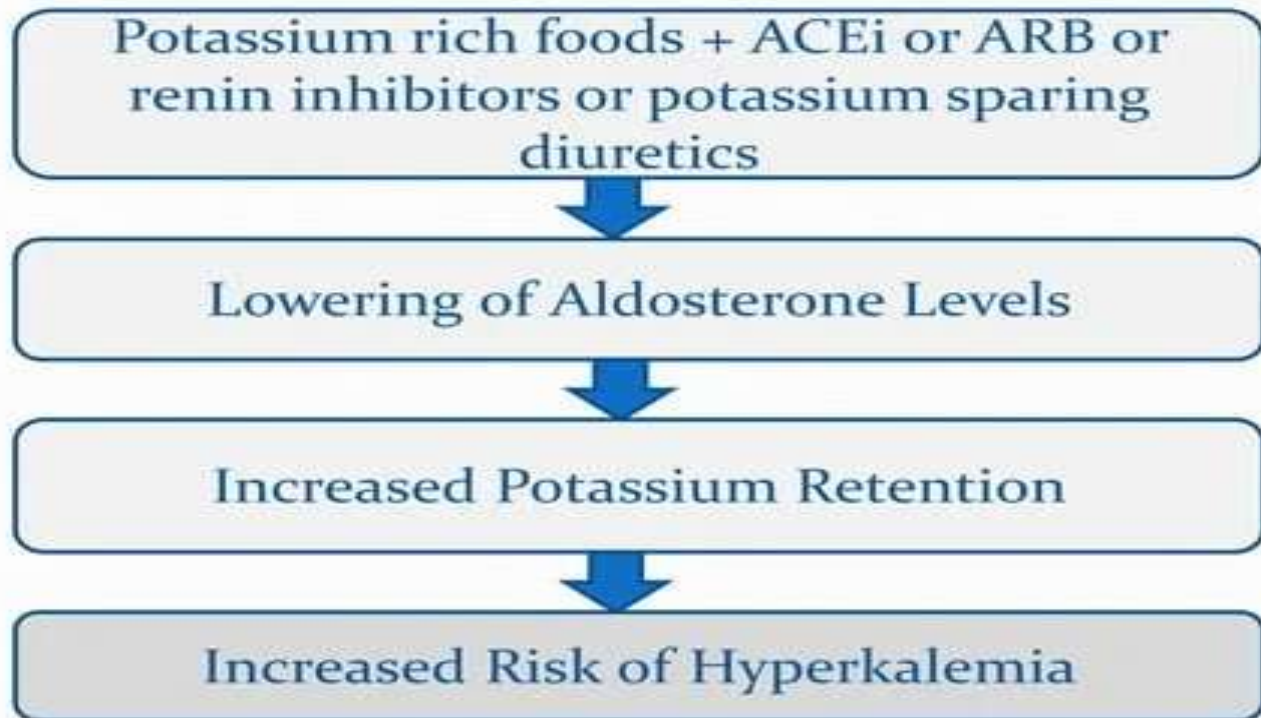
# Mechanism of some Food-Drug Interactions

- Vitamin-K rich food( Spinach, Turnip greens , mustard greens, Beet greens , Broccoli etc.)



# Mechanism of some Food-Drug Interactions

- Potassium rich foods(squash ,spinach ,lentils etc.)





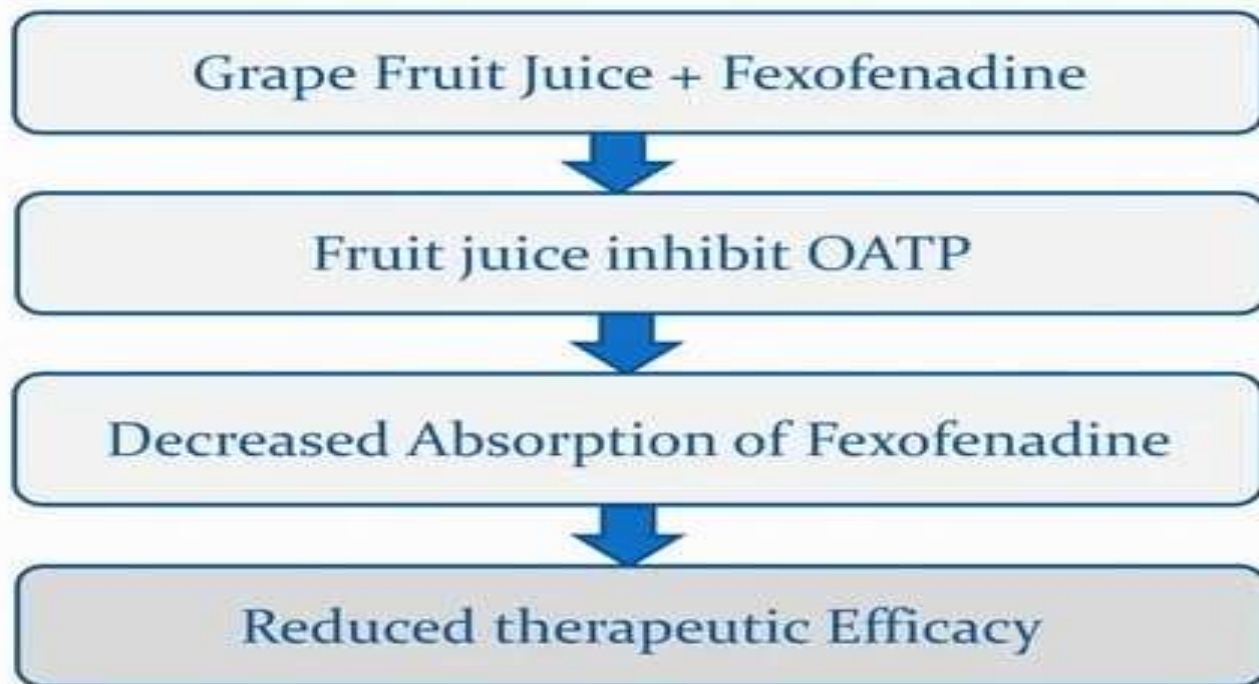
## Mechanism of some Food-Drug Interactions

- Fiber Rich Foods(wheat , oat , sunflower seeds , coconut shreds , black beans , green peas etc.)



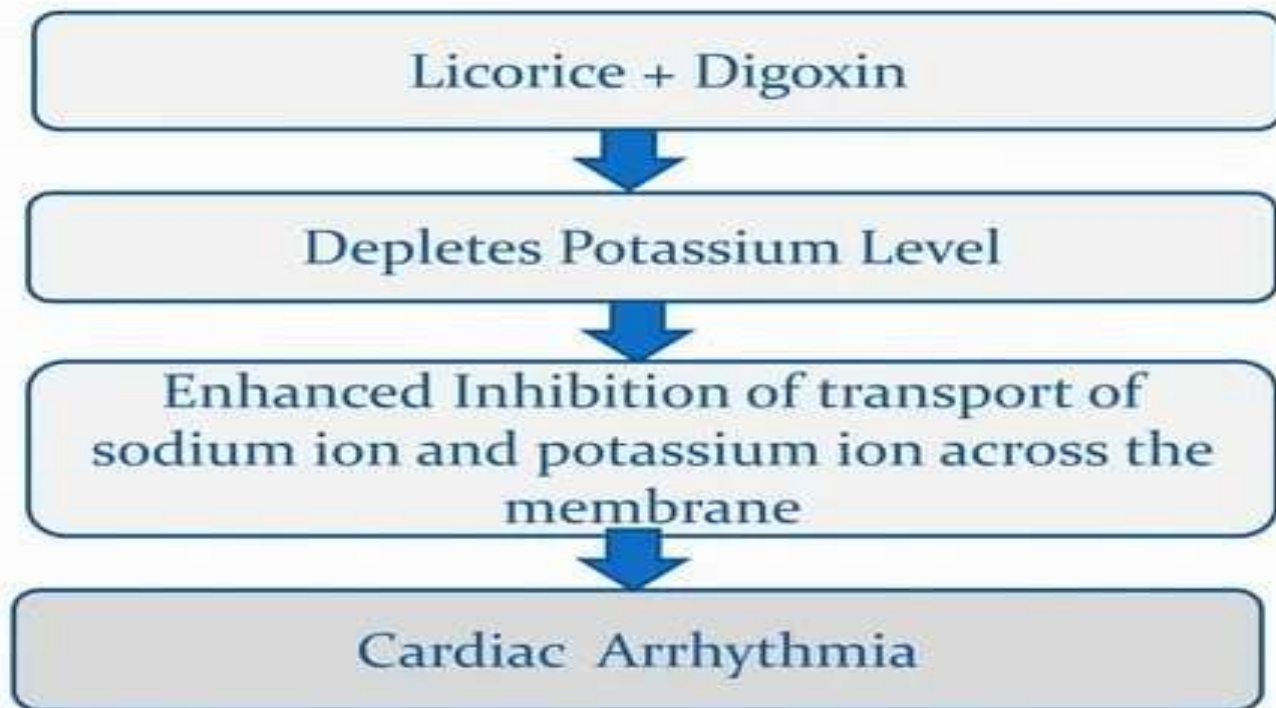
# Mechanism of some Food-Drug Interactions

- Grape Fruit Juice



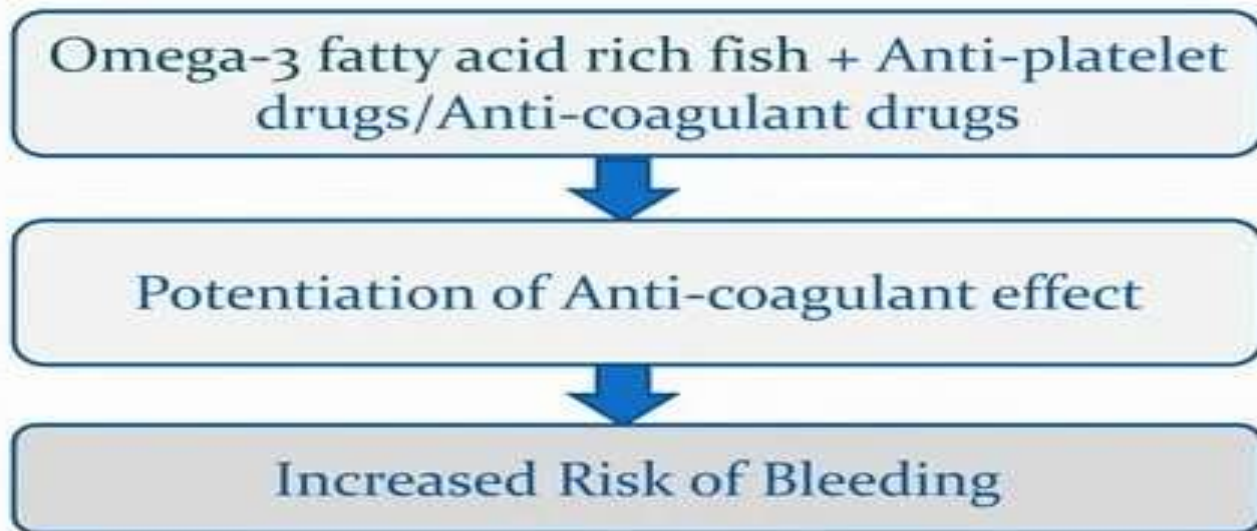
# Mechanism of some Food-Drug Interactions

- Licorice



# Mechanism of some Food-Drug Interactions

- Omega-3 fatty acid rich fish(salmon ,tuna , bluefish, herring , menhaden, trout etc.)





# Management of Food-Drug Interaction

- Identify the patient risk factors
- Take complete drug history
- Knowledge of action of the drug being used
- Consider therapeutic alternatives
- Time interval
- Monitoring of therapy
- Patients self-assessment



**THANK YOU**