

## Mecanisms of interactions between medicines and food

<p><b>Alteration of the intake of food</b></p> <ul style="list-style-type: none"> <li>- Modification of appetite ex: amfetaminas reduce the appetite and astemizol (antihistamin) increase it</li> <li>- Alteration of smell and taste ex: metotrexate</li> <li>- Stimulation of nausea and vomiting ex: digitalics</li> <li>- Modification in mouth: dryness, ex: phenobarbital</li> <li>- lesion in mucosa, ex: metotrexate</li> </ul>	
<p><b>Alteration of the absorption of food</b></p> <ul style="list-style-type: none"> <li>- Change in the acidity of of GI ex: antiacids reduce absorption of iron</li> <li>- Alteration of the secretion in GI ex: cimetidine enhance the digestion of fat</li> <li>- Alteration of the motility of GI, ex: laxatives</li> <li>- Inactivation of enzymes ex: neomycin reduce the activiy of lipase</li> <li>- Injury of the mucosa (quimotherapy)</li> <li>- Binding with nutrients and inhibition of of its absorption ex: antiacids block the absorption of phosphorus</li> </ul>	<p><b>Food that modify the absorption of medicines</b></p> <ul style="list-style-type: none"> <li>- Modification of the acidity of GI ex: sweets could dissolve antiasthma of prolonged action</li> <li>- Stimulation of the digestion secretion: grisofulvin is consumed better with food</li> <li>- Reduction of the digestive process ex: Aspirin is absorbed with lentiud if consumed with food</li> <li>- Union with medicine ex: tetracyclin is binding with calcium and reduce its absorption</li> <li>- Compete with areas of absorption: aminoacids interfere with the absorption of levodopa</li> </ul>
<p><b>Alteration of the metabolism of nutrients</b></p> <ul style="list-style-type: none"> <li>- Interfere with the enzymes system ex: phenobarbital compete with the coenzymes folate</li> </ul>	<p><b>Food that intefere with the metabolism of medicines</b></p> <ul style="list-style-type: none"> <li>- Interfere with the action of medicines ex: phenobarbital and folate</li> <li>- Substances in food with pharmacological activity ex: tiramine and IMAO</li> </ul>
<p><b>Alteration of excretion of nutrients</b></p> <ul style="list-style-type: none"> <li>- Alteration of reabsorption in uninary system ex: diuretics increase loss of sodium, potassium calcium, magnesium and zinc</li> <li>- Displacing the nutrients from transport plasmatic proteins ex: aspirin displaces folate from its transport plasmatic protein</li> </ul>	<p><b>Food that change the elimination of medicines</b></p> <ul style="list-style-type: none"> <li>- Modification of urinary PH Ex: VC modify the elimination of aspirin</li> </ul>

## Most frequent interaction of medicines- nutrients

<b>Medicine</b>	<b>Interaction</b>
<p><b>Analgesics</b></p> <ul style="list-style-type: none"> <li>- Aspirin and non-steroid antiinflammatories</li>   <li>-Paracetamol:</li>   <li>- Codein:</li> </ul>	<ul style="list-style-type: none"> <li>- The presence of food in stomach reduce the absorption because of modification of PH</li> <li>- Avoid drinking alcohol because of high risk of bleeding</li>   <li>- The presence of food reduce the absorption, pectin reduce it more               <ul style="list-style-type: none"> <li>- Diet low in protein reduce the hepatoxicity</li> </ul> </li>   <li>- Should take fiber and water to avoid constipation, alcohol interact with analgesic effect</li> </ul>
<p><b>Antibiotics</b></p> <ul style="list-style-type: none"> <li>- Amoxicillin, ampicillin, cephalosporin</li>   <li>- Neomycin, Kanamycin</li>   <li>- Tetracyclin:</li> </ul>	<ul style="list-style-type: none"> <li>-Milk and juice acidity reduce the the effectiveness of antibiotics</li>   <li>- The presence of food in stomach reduce the rate of absorption</li>   <li>- The intake with food, specially diet high in fat reduce the absorption because it stimulates bile salts which form insoluble salts with medicine</li>   <li>- The intake with diary products reduce its absorption because it forms insoluble salts with calcium</li> <li>- Reduce the absorption of VC</li> </ul>
<p><b>Laxatives:</b></p>	<ul style="list-style-type: none"> <li>- Accerelate the intestinal transit that reduce the absorption of micronutrients</li> </ul>
<p><b>Antiacids:</b></p>	<ul style="list-style-type: none"> <li>- Destroy VB1 because of increasing PH, the antiacid in form of phosphate, salicilate of AL, Mg ... could reduce the absorption of mineral salts (iron, phoforus)</li> </ul>
<p><b>Antihistamines:</b></p>	<ul style="list-style-type: none"> <li>- Some these medicines inteact with alcohol and some pesticides</li> </ul>

## **Heart and blood pressure**

- Anticoagulants:

- Should not taken with broccoli, green leafy vegetables (spinach..) high in vitamin K

- ACE inhibitors:

- Should be taken in an empty stomach

- Digitalics:

- Preferably with food but not diet high in fiber because it reduces its absorption

- Diuretics:

- May Cause deficiency of potassium

## Medicine, herbs and food interaction

**Tomato:** Contain small quantity of **toxic substances (solanine)** which trigger **headache and allergy**

- Can cause acid reflux

**Strawberry, Raspberry, Spinach and Rhubarb:** contain **oxalic acid** which **aggravate kidney and bladder stones** in susceptible people.

**Raspberry, plum and peach:** have **salicylate** so may cause allergy in people **sensitive to aspirin**.

**Grapefruit juice:** interact with **calcium channel blockers (nifedipine and verapamil)**, **cholesterol control medicines, estrogen, oral contraceptives, some psychiatric medicines and many allergic medications.....** (it affects the metabolism of medicine in liver)

**Black licorice:** should not be taken with **digoxin and diuretics and calcium channel blockers**

**Garlic:** capsules combined with **diabetics medication** can cause a dangerous decrease in blood sugars, garlic has **anti clotting properties**.

**Ginseng:** can increase blood pressure, taking **ginseng, garlic** or supplement containing **ginger with coumadin** can cause bleeding episodes; so should consult the doctor before taking these medicines. **Consuming caffeine** with ginseng increase the risk of overstimulation and gastrointestinal upset.