A SHORT REVIEW ON DRUG-FOOD INTERACTION

Mayur B. Mahajan*, Chetan N. Jain, Akash S. Jain, Ramji N. Kuwar, Laxmikant B. Borse, Sunil P. Pawar

P.S.G.V.P.M’s College Of Pharmacy Shahada, Dist-Nandurbar-425409

ABSTRACT

Drug-Food interaction studies have gained considerable importance. Drug-Food interaction studies focus on the effect of food on the release and absorption of a drug. It is a difficult and complex problem to accurately determine the effects of food and nutrients on a particular drug. There are many dramatic results or problems caused by food-drug, drug-drug and alcohol-food-drug interactions. This Drug-Food/Drug Herb Interaction Guidelines are designed to help you understand that when medications (prescription and/or over the counter) are taken together with certain foods or herbal substances, unwanted side effects may occur.

Keywords: Drug-Food Interaction, Classification.

INTRODUCTION

Many people have the mistaken concept that being natural, all herbs and foods are safe. This is not so. Very often, herbs and foods may interact with medications normally taken that result in serious side reactions. Experts suggest that natural does not mean it is completely safe. The medication that is taken by mouth travels through the digestive system in the same way as food and herbs taken orally do. When drugs and certain foods are taken at the same time, they can interact in such a way that decrease the effectiveness of the ingested drug or reduce the absorption of food nutrients. Additionally, vitamin and herbal supplements taken with prescribed medication can result in adverse reactions. A drug-food interaction happens when the food affects the ingredients in a medicine which the patient is taking affecting the efficacy of medicine being administered. High-risk patients, such as the elderly patients taking three or more medications for chronic conditions, patients suffering from diabetes, hypertension, depression, high cholesterol or congestive heart failure should be especially monitored for such drug–food interactions. Medications, both prescription and over-the-counter, are used every day to treat acute and chronic illness. Research and technology constantly improve the drugs we have available and introduce new ones. Medications can help people live healthy lives for a prolonged period. Although medicines are prescribed often, it is important to realize that
they must still be used with caution. Foods, and the nutrients they contain, can interact with medications we take. This can cause unwanted effects. A food/drug interaction occurs when a food, or one of its components, interferes with the way a drug is used in the body. A drug/nutrient interaction occurs when a drug affects the use of a nutrient in the body. This fact sheet describes common food/drug and drug/nutrient interactions. We hope this will help you see the potential for interactions and learn to avoid them. Be sure to talk with your doctor and pharmacist to get the maximum benefits from your medications. Foods can interfere with the stages of drug action in a number of ways. The most common effect is for foods to interfere with drug absorption. This can make a drug less effective because less gets into the blood and to the site of action. Second, nutrients or other chemicals in foods can affect how a drug is used in the body. Third, excretion of drugs from the body may be affected by foods, nutrients, or other substances. With some drugs, it’s important to avoid taking food and medication together because the food can make the drug less effective. For other drugs, it may be good to take the drug with food to prevent stomach irritation.[11,12,14]

The first occasion for a food-drug interaction to occur is during the absorption phase of the drug. Most drugs are optimally absorbed in the small intestine and food ingestion can either reduce or increase the rate or extent of absorption. With some drugs the presence of increased amounts of stomach acid results in the destruction of acid-labile drugs. In other cases food components such as calcium or iron may chelate some drugs reducing their absorption. Delayed absorption does not necessarily reduce the total overall exposure to the drugs and the area under the curve (AUC) may be equivalent regardless of how the drug is taken. On the other hand some medicines should be taken after meals since their bioavailability is enhanced by food. Table summarizes below some of these interactions. [1,17]

How drugs react in the body[11]

In order to understand food/drug and drug/nutrient interactions, it’s important to understand how drugs work in the body. There are four stages of drug action for medicines taken by mouth:

- **Stage 1.** The drug dissolves into a useable form in the stomach.
- **Stage 2.** The drug is absorbed into the blood and transported to its site of action.
Stage 3. The body responds to the drug and the drug performs a function.

Stage 4. The drug is excreted from the body either by the kidney, the liver, or both.

**DRUG-FOOD INTERACTIONS**

The relationships and interactions between foods, the nutrients they contain and drugs are gaining recognition in the health care and medical fields. Certain foods and specific nutrients in foods, if ingested concurrently with some drugs, may affect the overall bioavailability, pharmacokinetics, Pharmacodynamics and therapeutic efficacy of the medications. Furthermore, the therapeutic efficacy of many drugs depends on the nutritional status of the individual. In other words, the presence or absence of some nutrients in the gastrointestinal tract and/or in the body’s physiological system, such as in the blood, can enhance or impair the rate of drug absorption and metabolism. Drug food interactions can happen with both prescription and over-the-counter medicines, including antacids, vitamins and iron pills. Foods containing active substances that interact against certain medications can produce unexpected or adverse effects. Pharmacist can give the information of such interactions to the patients. \(^2\) Nutrients include food, beverages and dietary supplements. Consumption of these substances may alter the effects of drugs the patient takes. Food and nutrients can also alter a medication effectiveness in many ways. Food can increase or decrease the absorption of a drug. Absorbing less than the intended dose may decrease the effect of the drug. \(^11,13,14\)

**CLASSIFICATION OF FOOD EFFECTS**

Early characterization of food effect response is important in drug development to provide dosing conditions that will minimize variability in drug absorption during pivotal clinical trials. Food effect studies are also important in testing in vivo performance of a dosage form under widely different physiological conditions. The various ways in which food can effect gastrointestinal (GI) physiology, and thereby drug absorption of great importance for the drug absorption process are changes in gastric emptying time, GI motility, splanchnic blood flow, and GI secretion. The absorption of drugs from the gastrointestinal tract can be affected considerably by simultaneous intake of meals, particularly meals with a high fat content. In this regard the following factors play an important role: increase in pH in the stomach,
intensification of bile secretion, reinforcement of motility, increase of blood-flow and retardation of the gastric transit time. Prior to initiating an \textit{in vivo} food–drug interaction study, some of these factors should be mimicked \textit{in vitro}. Ideally, the \textit{in vitro} release should not be affected by pH value, buffer capacity, surface tension, turbulence of the dissolution medium and agitation by the apparatus. The most recent regulatory requirements on \textit{in vitro} dissolution can be found in the corresponding guidelines.\textsuperscript{[12,15,17]} The absence of all of the above mentioned \textit{in vitro} factors on the dissolution of the formulation investigated was confirmed \textit{in vivo} by extensive food–drug interaction studies which clearly demonstrated lack of food interaction for various formulations.

Differences were seen in the \textit{in vivo} pharmacokinetic characteristics for two apparently identical theophylline sustained release products, which were used as reference products in bioequivalence studies in the US and in Europe, respectively. Although both reference formulations were manufactured by the same international group according to the same \textit{in vitro} controlled release principle, there \textit{in vivo} differences in concentration-time profiles could – in this case retrospectively – be explained by different \textit{in vitro} dissolution profiles after 4 hours.

\textbf{Example:} Dietary calcium can bind to the antibiotic tetracycline. As a result the body does not absorb the amount of antibiotic intended.\textsuperscript{[12,15,17]}
Example: Drugs are absorbed more quickly into the body when the stomach is empty. Having food in the stomach will slow down a medication’s absorption. Sometimes a medication should be taken with food. Other medications should be taken on an empty stomach, one hour before or two hours after eating. It is important to read the directions to see if a medication should be taken with or without food.\(^{[2,15]}\)

Example: The type of food or beverage consumed with a medication can affect a medication’s absorption. Usually, medications should be taken with water. Acidic soft drinks, juices, and foods may produce excess stomach acidity which may destroy a medication or cause a medication to dissolve in the stomach instead of the intestine. Acidic foods may dissolve a timed release medication all at once instead of over time.\(^{[12,13]}\)

**Fig 1:**- drug-food interactions.

Food: Like food, drugs taken by mouth must be absorbed through the lining of the stomach or the small intestine. Consequently, the presence of food in the digestive tract may reduce absorption of a drug. Often, such interactions can be avoided by taking the drug one hour before or two hours after eating. Dietary fiber also affects drug absorption. Pectin and other soluble fibers slow down the absorption of acetaminophen, a popular painkiller. Bran and other insoluble fibers have a similar effect on digoxin, a major heart medication. Certain vitamins and minerals impact on medications too. Large amounts of broccoli, spinach and other green leafy vegetables high in vitamin K, which promotes the
formation of blood clots, can counteract the effects of heparin, warfarin and other drugs given to prevent clotting.\textsuperscript{[3-16]}

**Dietary Supplements:** Dietary supplements, including medicinal herbs are products that contain a vitamin, mineral; herb or amino acid and that are intended as a supplement to the normal diet. Supplements are regulated as foods not as drugs so they are not tested as comprehensively. However, they may interact with prescription or over-the-counter drugs. People who take dietary supplements should inform their doctors and pharmacists so that interactions can be avoided. Some dietary components increase the risk of side effects. Theophylline, a medication administered to treat asthma contains xanthines, which are also found in tea, coffee, chocolate and other sources of caffeine. Consuming large amounts of these substances while taking theophylline, increases the risk of drug toxicity.\textsuperscript{[2]}

**Alcohol:** Alcohol affects body processes and interacts with many drugs. Alcohol is a drug that interacts with almost every medication, especially antidepressants and other drugs that affect the brain and nervous system. For example, taking alcohol with metronidazole can cause flushing, headache, palpitations, nausea and vomiting.\textsuperscript{[4]} Foods containing active substances that interact against certain medications can produce unexpected or adverse effects. Pharmacist can give the information of such interactions to the patients.\textsuperscript{[2]}

**FACTOR AFFECTING THE EXTENT OF INTERACTION BETWEEN FOOD AND DRUGS**

Risk Factors Risk for food/drug and drug/nutrient interactions can be affected by many factors such as:

- age
- gender
- medical history
- body composition
- nutritional status
- number of medications used

The impact of drug-food interactions depend on a variety of intervening factors like dosage of the drug, person's age, size and state of health. Apart from these, the time foods
and the medications are taken also play an important role. Avoidance of drug interactions does not necessarily mean avoiding drugs or foods. In the case of tetracycline and dairy products, these should simply be taken at different times; rather than eliminating one or the other from the diet. Sufficient information about the medications and timing of medications around food intake can help to avoid drug interaction problems. \[2, 4\]

**EFFECT OF DRUG-FOOD INTERACTIONS**

Not all medicines are affected by food, but many medicines can be affected by the food and it's time. For example, taking some medicines at the same time with food may affect the absorption of the medicine. The food may delay or decrease the absorption of the drug. This is why some medicines should be taken on an empty stomach. On the other hand, some medicines are easier to tolerate when taken with food. It is always advised to ask the doctor or pharmacist whether it's correct to take the medicine with a snack or a meal or whether it should be taken on an empty stomach. \[1, 6, 13, 16\]

**TABLE 1: SOME EXAMPLES OF DRUG-FOOD INTERACTIONS THAT ACCELERATE THE ABSORPTION OF DRUGS \[5, 15-17\]**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Mechanism</th>
<th>Counseling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbamazepine</td>
<td>Increased bile production, enhanced dissolution and absorption.</td>
<td>Take with food.</td>
</tr>
<tr>
<td>Griseofulvin</td>
<td>Drug is lipid soluble, enhanced absorption with high-fat foods.</td>
<td>Take with high-fat foods.</td>
</tr>
<tr>
<td>Nitrofurantoin, Phenytoin And Propoxyphene</td>
<td>Delayed gastric emptying improves dissolution and absorption.</td>
<td></td>
</tr>
<tr>
<td>Propranolol</td>
<td>Food may reduce first-pass extraction and metabolism.</td>
<td>Take with food.</td>
</tr>
</tbody>
</table>

**MECHANISMS OF DRUG-FOOD INTERACTIONS**

Pharmacokinetic Interactions Drug Absorption Interactions
Food may affect drug absorption in the GI tract by altering gastric pH, secretion, gastrointestinal motility and transit time. This may result in a change in the rate. For example, azithromycin absorption is decreased when it is taken with food, resulting in a 43% reduction in bioavailability. Sustained-release theophylline products when taken with high-fat foods may cause a sudden release (dose dumping) of theophylline, resulting in increased theophylline concentrations and possible toxicity. Children are more prone to this interaction than adults.\textsuperscript{[11,13,15]}

Table 2: Some examples of drug-food interactions that delay the absorption of drugs

<table>
<thead>
<tr>
<th>Drug</th>
<th>Mechanism</th>
<th>Counseling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>High pectin foods act as Adsorbant and protectant.</td>
<td>Take on empty stomach if not contraindicated.</td>
</tr>
<tr>
<td>Digoxin</td>
<td>High–fiber, high–pectin foods bind drug.</td>
<td>Take drug same time with relation to food, Avoid taking with high-fiber foods.</td>
</tr>
<tr>
<td>Glipizide</td>
<td>Mechanism Unknown</td>
<td>Affects blood glucose; more potent when taken half hour before meals.</td>
</tr>
<tr>
<td>Sulfonamides</td>
<td>Mechanism unknown</td>
<td>Taking with meals may prolong gastric emptying.</td>
</tr>
</tbody>
</table>

In other cases, the components of the food, such as calcium or iron, may form complexes with the drug that are less easily absorbed. Examples include tetracycline, sodium fluoride and ciprofloxacin. The absorption of alendronate is impaired by food, calcium and almost everything, including orange juice and coffee. It should be taken with plain water and nothing else should be consumed for at least 30 minutes. In many cases, the actual mechanism by which food interferes with absorption is not known. Delayed absorption does not necessarily reduce the total overall exposure to the drug; the area under the curve (AUC) may be equivalent regardless of how the drug is taken. A reduced
rate of absorption may sometimes be useful in reducing the side effects of a drug, as in the cases of ibuprofen, without reducing bioavailability. The bioavailability of some drugs may be enhanced by food. For example, an acid environment is necessary for the absorption of ketoconazole. The absorption of griseofulvin is increased by fat in a meal. Fenofibrate, mebendazole, isotretinoin, tamsulosin, carbamazpine and labetalol are examples of drugs that will be better absorbed when taken with food. Improved absorption of a drug may or may not have a significant effect on the drugs efficacy. [6]

Patients taking digoxin should avoid taking bran fiber, pectin-containing foods such as apples or pears, or fiber containing, bulk-forming laxatives at the same time, since these agents may bind to the digoxin, decreasing its absorption. This interaction could result in decreased serum concentrations of digoxin and therapeutic effectiveness. It is advisable to take some medications with food to reduce gastrointestinal irritation and possible nausea. Examples of these medications include potassium supplements, ferrous sulfate, non steroidal anti-inflammatory drugs, estrogen, prednisone, tacrine, terfenadine and nitrofurantoin. Cholesterol-lowering agent lovastatin should be taken with food to enhance gastrointestinal absorption and bioavailability. Simvastatin, pravastatin and fluvastatin may be taken without regard to food.[2,4] Examples of some drugfood interactions which accelerate and delay the absorption of drugs are shown in table 1 and table 2 respectively with the brief counseling.[5,3,16]

Drug Metabolism Interactions

![Drug Metabolism Interactions](image)

**Fig 2:** Drug Metabolism Interactions.

Food may alter the hepatic metabolism of some drugs. It has been reported that when administered with the antihypertensive drug felodipine, concentrated grapefruit juice
caused an increase in the bioavailability of felodipine. The mean felodipine bioavailability with grapefruit juice was 284% (range 164%–469%) that of water. This resulted in lower diastolic blood pressures and increased heart rate in the male study volunteers. Adverse effects such as headaches, facial flushing and lightheadedness were more common after ingestion of 250 ml grapefruit juice (125 ml frozen grapefruit concentrate plus 125 ml of water). The bioavailability of nifedipine with grapefruit juice was 134% (range 108%–169%) of that with water. Orange juice did not have these effects. It is postulated that flavonoid compounds in grapefruit juice concentrate inhibit cytochrome P-450 metabolism of felodipine and nifedipine. This interaction could increase both the efficacy and toxicity of these calcium channel blockers. There is potential clinical significance because citrus juices are frequently consumed at breakfast, when many medications are also taken. Patients should be advised of this possible interaction.7, 8 First-pass hepatic metabolism of propranolol and metoprolol may be decreased when either medication is taken with food, thereby enhancing bioavailability. Drug levels and therapeutic efficacy may be increased due to this interaction. Monoamine oxidase (MAO) inhibitors are known to interact with foods containing tyramine. Tyramine is normally inactivated by the enzyme monoamine oxidase and this prevents tyramine from accumulating in the body. Monoamine oxidase inhibitors cause increased levels of tyramine which can lead to a hypertensive crisis. Patients taking monoamine oxidase inhibitors should avoid foods high in tyramine such as aged cheeses, pickled fish, yeast extracts, red wine, some types of beer (including nonalcoholic beer), fava beans and fermented products. Highprotein foods that have been aged, fermented, pickled, smoked or bacterially contaminated are unsafe for patients taking MAO inhibitors. Foods considered safe when used fresh and in moderation include sour cream, yogurt, meat extracts, chopped liver, dry sausage and alcoholic beverages.[9,12]

Drug Excretion Interactions

Foods may alter the urinary pH, which can affect the activity of certain drugs. The half-lives of some medications can be significantly changed by alterations in urinary pH. Therefore, the half-life of acidic drugs will be extended in acidic urine because the drug is in its unionized form. However, the half-life of an acidic drug in alkaline urine is reduced because the drug is in its ionized form. Foods such as milk, vegetables and citrus
fruits can alkalinize the urine. Meats, fish, cheese and eggs can acidify the urine. Foods may alter the renal excretion of some medications. Lithium and sodium compete for tubular reabsorption in the kidney. A high-salt diet causes more lithium to be excreted, whereas a low-salt diet causes decreased renal excretion of lithium and an increase in serum lithium levels.\[6]\n
Pharmacodynamic Interactions

Foods may interact with medications by altering their pharmacologic actions. Diets high in vitamin K may cause antagonism of warfarin and decreased therapeutic efficacy of the anticoagulant. Foods rich in vitamin K include green leafy vegetables (kale, turnip greens, spinach, broccoli and brussels sprouts), cauliflower, chick peas, green tea, pork liver and beef liver. Alcoholic beverages may increase the central nervous system depressant effects of medications such as benzodiazepines, antihistamines, antidepressants, antipsychotic, muscle relaxants, narcotics or any drug with sedative actions.\[3\] An example of a food potentiating the effect of a medication is coffee, as caffeine has additive effects on theophylline. It has been reported that caffeine increased serum theophylline levels by 20%–30% and increased the half-life of theophylline by decreasing clearance. Patients may complain of nervousness, tremor or insomnia. Caffeine has some bronchodilatory effects, which may enhance the effects of theophylline. A lower dosage of theophylline may be necessary for those patients who consume excessive quantities of coffee (more than 6 cups daily).\[7,12,16\]

ROLE OF PHARMACIST IN PREVENTION OF DRUG-FOOD INTERACTIONS

Pharmacists in every practice setting need to be vigilant in monitoring for potential drug-food interactions and advising patients regarding foods or beverages to avoid when taking certain medications. It is imperative for pharmacists to keep up-to-date on potential drug-food interactions of medications, especially today’s new drugs, so that they may counsel properly. In providing drug information to patients, pharmacists often discuss potential side effects and how the medication should be taken. It is important to provide information to patients on when to take their medications in relation to food intake. Consequences of drug-food interactions may include delayed, decreased or enhanced absorption of the drug. Food may also affect the bioavailability, metabolism and excretion of certain medications. The patient may
experience an adverse side effect or toxicity or may not receive the full therapeutic benefit of the medication. The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) requires that a patient’s medication profile include potential drug-food interactions, that the pharmacist call the prescriber whenever the potential for a medication-food interaction exists and document the communication and follow-up action on the prescription or order form, and that patients be given instructions and counseling regarding the potential for drug-food interactions before their hospital discharge. Elderly patients may be at a greater risk for drug-food interactions because they typically consume more medications for their chronic medical conditions. A study of drug-nutrient interactions in long-term care facilities found a significant relationship between the number of medications a resident consumed and the number of drug-nutrient interactions for which a resident was at risk.\textsuperscript{[14]}

COUNSELING AND GUIDANCE ABOUT DRUG-FOOD INTERACTIONS
The following information can be given to the patients while dispensing the medicine.\textsuperscript{13-14}

\begin{itemize}
\item Read the prescription label on the container. If you do not understand something or think you need more information, ask your physician or pharmacist.
\item Read directions, warnings and interaction precautions printed on all medication labels and package inserts. Even over-the-counter medications can cause problems.
\item Take medication with a full glass of water.
\item Do not stir medication into your food or take capsules apart (unless directed by your physician). This may affect the efficacy of medication.
\item Do not take vitamin pills at the same time you take medication. Vitamins and minerals can interact with some drugs.
\item Do not mix medication into hot drinks because the heat from the drink may destroy the effectiveness of the drug.
\item Never take medication with alcoholic drinks.
\item Be sure to tell your physician and pharmacist about all medications you are taking, both prescription and nonprescription.
\item Check with the pharmacist on how food can affect specific medications taken with the food.\textsuperscript{[17]}
\end{itemize}
Medications can interact with other medications or be affected by the foods that you eat. Below is a list of common interactions. If you are taking any of the medications listed below.

<table>
<thead>
<tr>
<th>Examples of medications to be taken with food</th>
<th>Avoid drinking grapefruit juice when taking the following drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Anafranil</td>
<td>• Verapamil</td>
</tr>
<tr>
<td>• Aspirin</td>
<td>• Versed</td>
</tr>
<tr>
<td>• Augmentin</td>
<td>• Xanax</td>
</tr>
<tr>
<td>• Ceftin</td>
<td>• Zocor</td>
</tr>
<tr>
<td>• Cytotec</td>
<td>• Halcion</td>
</tr>
<tr>
<td>• Decadron</td>
<td>• Invirase</td>
</tr>
<tr>
<td>• Feldene</td>
<td>• Lipitor</td>
</tr>
<tr>
<td>• Macrodantin</td>
<td>• Mevacor</td>
</tr>
<tr>
<td>• Mevacor</td>
<td>• Nimotop</td>
</tr>
<tr>
<td>• Prednisone</td>
<td>• Norvasc</td>
</tr>
<tr>
<td>• Naprosyn</td>
<td>• Plendil</td>
</tr>
</tbody>
</table>

Coumadin (Warfarin): Avoid drastic changes in consumption of foods high in vitamin K: beef liver, cabbage, kale, soybean oil, broccoli, collard greens, spinach, turnip greens, brussel sprouts, green tea, green leafy vegetables.

Levaquin, Cipro, and Tetracycline: Take one hour before or two hours after dairy products, antacids, iron, calcium, or zinc (including multivitamins).

Iron Supplements: For best absorption, take on an empty stomach; however it may be taken with food if it upsets your stomach.

Lithium: Should be given consistently with regard to food, preferably after meals.

Dilantin (Phenytoin): Take consistently at the same time in relationship to meals.

Theophylline: Limit caffeine and chocolate, which may increase nervousness.

Fosamax, Actonel: Take 30 minutes before the first food or drink of the day other than water. Sit upright or stand for at least 30 minutes after taking the medicine.

Sinemet (Carbidopa/Levodopa): Avoid taking with high protein meals.
Carafate (Sucralfate): Take one hour before meals with a full glass of water.\textsuperscript{[13]}

**PRECAUTIONS TO BE TAKEN**

- Medications need to be taken at different times relative to meals.
- Consult a physician when health problems persist.
- During pregnancy and nursing always consult a physician or pharmacist before taking any medication. Drugs taken by the mother may affect the infant.
- Check with a doctor or pharmacist for the proper way and time to take medication.

**The importance of following direction**

- It is important to follow the directions on how to take a medication. Many people do not take prescription or over-the-counter medications properly. Following the directions on how to take a medication can affect how or if a medication works.

**Who is at Risk of Drug-Nutrient Interactions?**

Some people may be at greater risk of drug-nutrient interactions than others. Those considered at higher risk for drug-nutrient interactions include.

- Persons who have a poor diet.
- Persons who have serious health problems.
- Growing children.
- Pregnant women.
- Older adults.
- Persons taking two or more medications at the same time.
- Persons using prescription and over-the-counter medications together.
- Persons not following medication directions.
- Persons taking medications for long periods of time.
- Persons who drink alcohol or smoke excessively.

**How to Lower the Risk of Drug-Nutrient Interactions**

- Eat a healthy diet following the recommended servings from the USDA Daily Food Plan.
- Follow directions on how to take medication (prescription and over-the-counter).
- Read warning labels on both prescription and over-the-counter medications.
- Do not share medications with others or take other peoples’ medications.
- Do not take over-the-counter medications frequently on your own.
- Tell your physician about everything you are taking, including over-the-counter medications, alcohol, and herbal products.
- Tell your physician and pharmacist about any new or intensified symptoms that develop when taking a medication.
- Keep a list of all medications (prescription and over-the-counter) that you use.
- If you have questions, ask your pharmacist, physician, or dietitian for answers.

Questions to Ask Your Physician When You Get a Prescription
- What is the medication for? (medication name, medication purpose).
- How should I take the medication? (dosing schedule, how long, storage recommendations, recommendations on consuming food and/or beverages with the medication).
- What should I expect? (expected outcomes, precautions, side effects)

CONCLUSION
Interaction between foods and drugs can have profound influence on the success of drug treatment and on the side effect profiles of many drugs. The clinical significance of drug-food interactions can be variable. Some foods greatly affect drug therapy, resulting in serious side effects, toxicity or therapeutic failure. In some instances, the interaction may have a beneficial effect by increasing drug efficacy or diminishing potential side effects. The interactions are not always detrimental to therapy, but can in some cases be used to improve drug absorption or to minimize adverse effects. These interactions have received more attention recently, especially drug interactions with grapefruit juice. As new drug approvals occur with ever increasing speed, there is less information available about their adverse effects and interactions when the drugs reach the market. Pharmacists in every practice setting need to be vigilant in monitoring for potential drug-food interactions and advising patients regarding foods or beverages to avoid when taking certain medications. It is imperative for pharmacists to keep up-to-date on potential drug-food interactions of medications, especially today’s new drugs, so that they may counsel properly to the patients.
REFERENCES


16. Sing Arjun, Sharma Raju, Anand kunwar manu-Food Drug Interaction-264

For Correspondence:
Mayur B. Mahajan
Email: mahajanm100@gmail.com