



Making Medications Work Best For Patients

Understanding the various factors that affect medications can help patients ensure their prescriptions are providing the intended therapeutic effects.

By Surayyah Morris

MEDICINE WAS CREATED to diagnose, treat, cure and prevent disease. The ultimate goal is to achieve a desired effect with as few side effects as possible. And, while many factors can affect this process, there are many ways to overcome the challenges associated with taking medications.

Patients who take medications such as intravenous immune globulin know that the side effects can be just as bad as the condition the medication is treating. It can seem as if the medication that helps one problem causes five more. Indeed, it can often be difficult to balance effective treatment with intolerable side effects. To help with this balancing act, following are some tips to assist with becoming a master of risk-benefit decision-making that should be applied accordingly, always ensuring doctors are informed of any changes. But, first, let's begin with a crash course on how the body affects medicine and vice versa.

How the Body Affects Medicine and Vice Versa

Pharmacokinetics, the process that occurs from the time the drug enters the body until the time it leaves the body, is known as ADME (absorption, distribution, metabolism, elimination/excretion):¹

- Absorption is the movement of a drug from its site of administration into the blood.

- Distribution is the movement of a drug from the blood into the tissues and into cells.

- Metabolism, also known as biotransformation, is the enzyme-mediated change in the structure of a drug that occurs when the drug enters the tissues and cells.

- Elimination/excretion is the movement of the drug as its metabolites out of the body.

Pharmacodynamics is the term used to describe what a drug does to the body.¹ Drugs act by mimicking or blocking the body's own regulatory processes. Therefore, they can only alter the rate of those processes; they cannot provide new functions. Because drug responses are not entirely predictable, it is important for prescribers to know the patient's body to determine the intensity of the drug's effects, which involves knowing the pharmacokinetics. Pharmacodynamics, however, does not always end when the drug physically leaves the body. Drugs can have an effect even after being eliminated/excreted.

Mastering the Risk/Benefits of Drugs

How can this information be used to patients' advantage? Following are a few ways to help patients understand and adjust some common life practices to make medications work for them and not against them.



Other medications. Other medications are one of the most common complications that can alter the effectiveness of a drug. Drug-drug interactions occur when one medication has an effect (either negative or positive) on another. For example, if drug A is taken at the same time as drug B, drug A may inhibit the metabolism of drug B, causing too much of drug B to remain in the body, which potentially increases its action and side effects. Contrarily, if drug A induces the metabolism of drug B, too little of drug B will remain in the body, which will inhibit its optimal therapeutic effect.

Combining medications can produce both a desired or undesired effect. For example, a desired effect results when two drugs work together to lower blood pressure if one medication is not working well enough. An undesired effect may occur when taking two medications that cause drowsiness or sleepiness, which can increase risk of falls, inattentiveness or make a person too tired to function.

 **tip** An important part of the pharmacist's job is to understand how medications react when taken together. And, while there are minor interactions that are not significant for most people, they may be significant for some.

Food and beverages. Meals and beverages affect some medications, which means medication may be better absorbed on an empty stomach versus a full stomach based on how the medication is affected by gastric contents or where in the body the drug is absorbed to be optimally effective. Medications best taken on an empty stomach are usually better to take in the morning before a meal with a glass of water. Medications best taken with a meal should be taken during or immediately after the meal.

 **tip** The prescription label should have in bold print whether the medication should be taken with or without food. It's important for patients to read the entire label to understand the important information they need to know.

Grapefruit juice can inhibit how some drugs are metabolized by increasing their therapeutic levels. An increase in grapefruit juice concentration can cause more of the prescription medication to be available for the body to absorb and use. Consequently, individuals may experience worse side effects and a more intense therapeutic effect than normal. There is no desirable amount of grapefruit juice to consume to delay or avoid this reaction; it should be avoided entirely when taking a medication that interacts with it.

 **tip** The prescription label will indicate if the medication should not be consumed with grapefruit juice.

Time of the day. Some medications may be better taken at a certain time of day (morning/midday/evening) based on how certain body processes work or how long it takes the medication to metabolize. For example, the human body synthesizes cholesterol at night, rendering cholesterol medications such as statins taken at night more effective. As another example, diuretics prescribed for blood pressure, which cause more frequent urination that can be better managed by simply changing the time of day they are taken. Taking diuretics in the morning will prevent individuals from running to the bathroom all night long if they are taken too late in the day.

 **tip** If a prescription causes more frequent bathroom use than usual, ask the pharmacist or doctor if it is OK to take the medicine earlier in the day.

Temperature and storage. Medications are greatly affected by temperature. If any medication is subjected to temperatures outside of its recommended storage temperature, it will likely begin to degrade or become so altered that it will be ineffective. To prevent this, prescriptions should be kept at the recommended temperature according to its package insert or medication guide:

- Room temperature: 68°F to 77°F (20°C to 25°C)
- Refrigerator: 35°F to 46°F (2°C to 8°C)
- Freezer: -58°F to +5°F (-50°C to -15°C)

If prescriptions are sent by mail, they should be removed from the mailbox as soon as possible. If prescriptions are required to be stored at less than room temperature, they should be packaged with an ice pack/cold pack. If they are not packed with an ice pack/cold pack, the pharmacy should be notified of this error so it can send medicine to replace what has been possibly compromised.

 **tip** Contrary to popular belief, the bathroom cabinet is not the best place to store medications because bathroom temperature and humidity levels vary, which is the quickest way to decrease medication effectiveness. Instead, they

should be stored in a cool, dry area away from heat sources or in a safe place in the bedroom.

Formulations and pill burden. If prescriptions are to be taken by mouth in pill form (such as a tablet or capsule), a request can be made of the physician to prescribe a different formulation for those who have difficulty swallowing. A different formulation could include a liquid, a sublingual tablet (melts under the tongue), an orally disintegrating tablet (melts on top of the tongue) or even a patch (sticks to skin so medicine can be absorbed). It should be noted that not all medications come in different formulations, and there are also other less common formulations available.

Aside from requesting an easier formulation, the pill burden can be decreased by asking the pharmacist or doctor if there is a combination medication available for two or more medications. A combination medication includes two to three separate medications that are safely combined into one pill. Combined medications are not common, but it is still worthwhile to see if one is available.

Lifestyle. This may take some extra thought and preparation, but it is still very much worth the effort. Calculate the time it takes to do an infusion — from preparing the medication to removing the needles and placing Band-Aids on the injection site. Let's assume it takes three hours. If patients know they typically experience post-infusion blues (fatigue, headache, nausea, etc.), they can use this to strategize when deciding which day to infuse. If the infusion is usually performed on a workday or school day, a late night can be sacrificed by starting the infusion around bedtime, so once it is finished, sleep can follow immediately after to, hopefully, eliminate any undesired blues. If there aren't any post-infusion issues, the infusion could be performed early in the morning.

The best advice for infusions when traveling is to do them before leaving home. If patients must infuse while traveling, medication should be prepared in advance. However, the pharmacist or doctor should be consulted.

tip Medications/supplies should always be kept on the person, not in checked baggage. A medication bag is a free carry-on when flying.

Social activities. Certain lifestyle habits can affect how medications work. These include:

- Smoking: Cigarettes cause many health problems, but they are also an inducer when taken with certain medications. This means the medication will clear the body faster and ultimately be less effective than intended.



- Alcohol: Although alcohol can safely be consumed with some medications, it's not safe for all. When medication interacts with alcohol, there is no easy way to emphasize how awful the outcome will be. It's best to consult with the pharmacist about any interactions before drinking alcohol and taking any prescription or over-the-counter medications to ensure unwanted reactions are prevented.

tip When in doubt, don't do it! It is always better to be safe than sorry.

Adhere to the Package Insert

Every prescription drug has a package insert that contains all of the important information patients need to know about the drug and its use. The package insert is a thin folded paper provided with the medication. The information on the package insert is also online and can be found by visiting the website for that particular drug, or by searching the medication on the U.S. Food and Drug Administration website.

Patients' understanding of the interaction between their medication and their bodies can go a long way to maximize the outcome of their treatment with the fewest unanticipated reactions. ❑

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Reference

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