When using non-prescription, over-the-counter (OTC) medications, care should be taken as these agents may have a direct effect on the heart and lungs or may interact with medications commonly prescribed for patients with PAH.

**Acceptable:** Medications that contain antihistamines (e.g., diphenhydramine, Benadryl, Claritin) may be used to treat cold symptoms, allergies, and hay fever, provided that they do not also contain decongestants. If there is uncertainty regarding the contents of specific formulations, ask a pharmacist for assistance. Always bring all your medications, particularly new and OTC substances for you PH specialist to review and authorize.

**Caution:** Cold, flu, sinus, allergy, decongestant and headache medications frequently contain ingredients such as pseudoephedrine that have stimulant-like properties. These medications cause vasoconstriction, and may acutely worsen PH by increasing blood pressure and heart rate. They may also cause palpitations and irregular heart rhythms.

**Interactions/Caution:** Aspirin and medications classified as "non-steroidal anti-inflammatory agents" (e.g., Advil, Motrin, Naprosyn, etc.) may increase the risk of bleeding in patients taking warfarin (Coumadin). These medications are typically found in analgesics, but may also be present in cold, allergy, and sinus medications. They should be used with caution and only for short periods of time, since long-term intake is not only associated with possible harmful effects for your pulmonary hypertension, but can also lead to kidney dysfunction, heart attacks, stomach ulcers, and more.

Large doses of acetaminophen (Tylenol) may cause liver damage, and may interact with warfarin. Whether acetaminophen increases the potential for liver damage in patients taking bosentan (Tracleer) or ambrisentan (Letairis) is unknown. Macitentan (Opsumit) does not appear to cause injury to the liver, but your doctor may still choose to monitor your liver function test. As a general rule we recommend avoidance of drugs that may injure your liver.

**Interactions/Caution:** The use of herbal medications has become increasingly popular. Unfortunately, there is very limited information on many of these products, and there are no established standards to regulate their production. As a general rule, a product marketed as "natural" should not be assumed to be safe.

Herbal compounds including garlic, ginkgo, and ginseng can affect the function of platelets (cells needed to clot the blood), which can increase the risk of bleeding in patients receiving warfarin or prostacyclin infusions (Flolan, Veletri). Some herbal medications can interact directly with warfarin, by either increasing (e.g., danshen, dong quai, papaya...
extract, vitamins A and E) or decreasing its effects (e.g., ginseng, vitamin K). One example of a potentially troublesome interaction is a very popular herb – St John's Wort. Taking this herb causes the liver to increase the removal of some PH drugs. This means that consumption of St. John’s Wort may result in decreased activity and efficacy of the medication used for PH. Grapefruit juice on the other hand, can have the opposite effect. It tends to decrease the removal of some PH medications which can potentially result in more activity and more side effects of PH medications.

Liver damage has been reported in patients using kava and Echinacea, and valerian may cause liver injury as well. Whether these compounds can increase the risk of developing liver damage in patients treated with bosentan or ambrisentan is unknown. Hence, herbal therapies should be viewed as drugs, not simply as "natural supplements", potentially harmful, and should therefore be used cautiously in patients with PAH.

**Avoid:** Therefore, **all decongestants and medications that contain stimulants** should be avoided in patients with PAH. They are marketed as tablets, caplets, liquid-gels, liquids or nasal sprays. Also, note that many nasal decongestants labeled as "saline” do contain sympathomimetics that should be avoided by the PH patient.

**Avoid:** Another category of substances to avoid include all forms of “energy boosters,” sold as popular drinks, tablets or capsules. They usually contain significant doses of caffeine, which in high dosages can have a stimulating action on the heart. Some of these boosters are also commonly mixed with alcohol, so the PH patient should be attentive to mixed drinks and their contents.

As a general rule, if any ingredient is contraindicated in patients with high blood pressure, then it is contraindicated in patients with PAH. You should always coordinate with your doctors, including your PH specialist, the use of any treatment for high blood pressure, including diuretics.

**Avoid:** **OTC products sold for erectile dysfunction** may be contaminated or contain chemical alterations of sildenafil, tadalafil or vardenafil. These alterations are difficult to detect and require sophisticated chemical testing. These OTC products should be avoided altogether as a general recommendation.

**Summary:** OTC medications, herbs, beverages and substances are not always safe for you if you suffer from PAH. We strongly recommend you share information about all prescribed drugs and OTC substances and supplements you may be consuming with your PH specialist.