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Ma Huang

Ma Huang, Yellow Horse, or Yellow Astringent is scientifically known as *Ephedra sinica*, *E. intermedia*, *E. equisetina*, and *Ephedra*. It's a natural product that is classified as a sympathomimetic. It mimics the sympathetic nervous system. In other countries outside the USA, the product is available as pills (tablets and capsules), tea, extract, supplements, and oil.

Before *Ephedra* was banned in the US due to its adverse effects, it was labeled to be used as a Nasal Decongestant and Bronchodilator. It's still used as such, as well as for other reasons in other countries. In traditional Chinese medicine, *Ephedra* was used for the following: Colds & Flu, fever, chills, headache, edema, bronchial asthma, lack of perspiration, nasal congestion, aching joints & bones, cough & wheezing. Other than Northeastern China (Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi), *Ephedra* is also native to Mongolia and Russia (Buryatia, Chita, Primorye). *Ephedra* is best grown in dry locations that have sandy, well-drained soil, with a lot of sun and very little water; usually planted during the springtime. It grows like a cactus and is able to tolerate cold weather, including frost and snow.

Ma Huang is manufactured and distributed mainly as a raw material. "Both AHPA and NNFA have recommended that raw material suppliers and manufacturers refrain from using any ingredients which contain 'added synthetically derived *Ephedra* alkaloids' and that member

companies ‘analyze and verify, as soon as appropriate testing methods are validated’ that there is no such material added to natural ma huang.”

Just like anything with a therapeutic effect has adverse effects, herbal supplements including Ma Huang have significant adverse effects, drug interactions, and potential contraindications. Ephedra contains ephedrine and pseudoephedrine, which is a sympathomimetic. It stimulates your alpha and both beta receptors, exciting your sympathetic nervous system. This means that your heart (beta 1) and your lungs (beta 2) are affected. Ephedrine creates similar effects as adrenaline, or epinephrine. It leads to vasoconstriction, cardiac stimulation, a lasting rise in BP, mydriasis (pupil dilation), and decreases excess blood flow to the extremities and other body parts (“diminishes hyperemia”).

When experiments were done on dogs and rabbits, pseudoephedrine was found to have a strong diuretic effect. In large doses, ephedrine can cause the following: Nervousness, headaches, insomnia, dizziness, palpitations, skin flushing and tingling, and vomiting. The Handbook of Nonprescription Drugs notes, "The principal adverse effects of ephedrine are CNS stimulation, nausea, tremors, tachycardia [rapid heartbeat], and urinary retention."

Before the FDA banned Ephedra in the US, they released a statement on nonprescription products such as Ephedra, stating that ephedrine should be avoided by anyone that has cardiovascular disease, hypertension, thyroid disease, diabetes, or an enlarged prostate that causes difficulty urinating. It also shouldn't be taken by anyone who has the following conditions: Gastric ulcers, sensitivity to stimulants, pregnant and/or nursing, or is diabetic.

Just as most drugs have adverse effects, they also can have contraindications and shouldn't be combined with other medication. Since ephedrine stimulates the release of

norepinephrine, giving ephedrine to someone who is taking a monoamine oxidase inhibitor can lead to severe hypertension. That's because the MoA of the MAO inhibitor causes norepinephrine to be stored and keeps it from degrading normally. " Although this is a potentially fatal interaction, there is very little clinical information available" "The British Herbal Pharmacopoeia (BHP) of 1983 offers the following warning for ma huang: 'Although Ephedra does not produce, in therapeutic dosage, the marked pressor effect of ephedrine, it should not be used in hypertensive cases in the presence of coronary thrombosis or with monoamine oxidase [MAO] inhibitors.' (BHP, 1983.)".

Based on a clinical study, the only time there is an oral manifestation is from toxicity when Ephedra is combined with caffeine. It causes salivation along with other non oral effects of cardiotoxicity. This brings us to the role of a dental hygienist. As hygienists, we should know about herbal medications that treat common conditions as well as other conditions. We need to know if a patient is taking anything that can interact with products we use during their dental visit, and we should also be able to warn a patient if they're taking something they shouldn't be taking because of a condition they have. We need to know whether or not this is something they need to further discuss with their primary care physician. Patients often try and go for the cheaper option if they can't afford to buy prescription medications or if they don't have insurance and can't afford to go to the doctor, they will often self diagnose and use OTC or herbal remedies to cure their ailments. There's also the patients who don't like to use medication and will always turn to herbal remedies for that reason. Patients may use the internet to research herbal supplements, others may do what others have told them, and you also have the role that culture plays. Many people have cultural remedies that have been used for ages and passed down from generation to generation, and that can be a big factor in why patients turn to herbs.

Because of all the uses of Ma Huang, there are many prescription medications that people try to replace it with. My best advice to my patients would be that they always consult with their PCP before taking any kind of supplement so that they don't accidentally cause harm to themselves. A simple combination of Ma huang and caffeine could kill by causing cardiotoxicity. The heart just gives out. Besides, the herbal supplement has way too many dangerous side effects, that replacing a prescription with the herb creates a situation where the benefit does NOT outweigh the risk. Hence, why the FDA has banned it in the US.

When we are knowledgeable about herbs and OTC supplements, we are more able to explain to our patients why they have certain symptoms related to their dental care. Although medications have a list of side effects on them, not many patients read the labels unless something is going on and they're not sure why. Others may not even read the label at all, and just wait for the symptoms to go away. For example, I've had patients who didn't know xerostomia was an adverse effect of medication, and they didn't know that the xerostomia was a factor in the caries process. That's where we come in as hygienists. We need to know how to talk to the patient and ask the proper questions in order to get the full picture. Because of the "split" between the mouth and the rest of the body, patients often don't mention other things that are going on outside of the mouth because they don't think it's connected. But in reality, that little piece of information can be the missing factor we need in order to know how to communicate with our patients regarding their oral and general health.

We should be comfortable in talking to our patients about all medications they may take, prescription or herbal. If we're not informed on the topics, we won't be doing our duty of giving our patients the best care possible.

Table 6 - Contraindications for Ephedrine Alkaloids

- High Blood Pressure
- Gastric Ulcers
- Active Heart Disease
- Stimulant Sensitivities
- Pregnancy
- Lactation
- Diabetes
- Thyroid Dysfunction
- Difficulty in Urination Due to Enlarged Prostate Gland

Table 1 - Uses of Ephedra in Traditional Chinese Medicine

• Colds & Flu	• Bronchial Asthma
• Fever	• Lack of Perspiration
• Chills	• Nasal Congestion
• Headache	• Aching Joints & Bones
• Edema	• Cough & Wheezing

Source: Leung & Foster, *Encyclopedia of Common Natural Ingredients Used in Food, Drugs and Cosmetics*, John Wiley & Sons, 1995.

Table 3 - FDA Approved Uses of Ephedrine and Pseudoephedrine in OTC Drugs

- Nasal Decongestant
- Bronchodilator

Source: Tentative Final Monograph for OTC Nasal Decongestant Drug Products 1/15/83, 50 *Federal Register*, pp. 2220-2241.
 Source: Final Monograph for OTC Bronchodilator Drug Products 10/2/86, 51 *Federal Register*, pp. 35326-35340.



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