

AN INTRODUCTION TO HERBAL MEDICINE

©David Winston, Herbalist, AHG

HERBS - PANACEA'S OR POISONS?

Certain herbs have become popular over the last twenty years, but herbal medicine is still poorly understood by the public, medical practitioners and the media. After a brief honeymoon where herbs have been portrayed as "wonder drugs", we are now seeing article after article on the dangers of herbs. As in most situations, the truth lies hidden under the media hype, bad or poorly understood science, exaggerated claims, and our natural resistance to new ideas.

Seeing herbal medicines as either panaceas or as poisons blinds us to the reality that in most cases they are neither. Lack of experience, lack of education, and lack of good information about herbs makes consumers easy victims of marketing exploitation and herbal myths. The same lack of experience, education, and information makes many physicians and other orthodox health care providers suspicious and uncomfortable, especially with the exaggerated claims, miracle cures, and unproven remedies their patients are taking.

We as a culture are coming out of what I call the "Herbal Dark Ages", a period of time when the use of herbs virtually ceased to exist within the United States. A few ethnic communities continued to utilize herbs, but from the 1920's into the 1970's the only herbs that mainstream Americans used were spices in cooking. Out of this almost total lack of exposure we have seen an amazing resurgence of interest in "natural" remedies.

Along with this new interest is a profound ignorance, with many people equating natural with harmlessness. Anyone who utilizes herbal products needs to understand a few basic safety rules. The fact that something is natural does not necessarily make it safe or effective. In Cherokee medicine we distinguish between three categories of herbs (Winston D, 1992). The "food herbs" are gentle in action, have very low toxicity, and are unlikely to cause an adverse response. Examples of "food herbs" include Lemon Balm, Peppermint, Marshmallow, Ginger, Garlic, Chamomile, Hawthorn, Rose hips, Nettles, Dandelion Root and Leaf, and fresh Oat extract. These herbs can be utilized in substantial quantities over long periods of time without any acute or chronic toxicity (it is important to note that allergic responses like with foods are possible, as are unique idiosyncratic reactions, and even common foods such as grapefruit juice, broccoli, and okra can interact with medications).

The second category is the "medicine herbs". These herbs are stronger acting - they need to be used with greater knowledge (dosage and rationale for use) for specific conditions (with a medical diagnosis) and usually for a limited period of time. These herbs are not daily tonics and they should not be taken just because "they are good for you". These herbs have a greater potential for adverse reaction and in some cases, drug interactions. The "medicine herbs" include Andrographis, Blue Cohosh, Cascara Sagrada, Celandine, Ephedra, Goldenseal, Jamaica Dogwood, Oregon Grape Root, Senna, and Uva-Ursi.

The last category is the "poison herbs". These herbs have strong potential for either acute or chronic toxicity and should only be utilized by clinicians who are trained to use them and clearly understand their toxicology and appropriate use.

Even though the herb industry is often portrayed as unregulated* and irresponsible, the vast majority of the herbs in this category are not available to the public and are not sold in health food or herb stores. Examples of "poison herbs" include Aconite, Arnica, Belladonna, Bryonia, Datura, Gelsemium, Henbane, Male Fern, Phytolacca, Podophyllum, and Veratrum.

Another example of a traditional system of medicine that categorizes herbs according to safety or potential toxicity is Traditional Chinese Medicine (TCM).

* The herb industry is regulated by the FDA and laws such as DSHEA (Dietary Supplement, Health and Education act passed by Congress in 1994

The Chinese materia medica is also divided into three categories: the upper class (superior) drugs are non-toxic and are tonic remedies. The middle class (ministerial) drugs may have some mild toxicity and they support the superior medicines. The last category is the lower class (inferior) remedies that are toxic and only used for specific ailments for limited periods of time.

A clear understanding of a herb's benefits and possible risks as well as a clearly defined patient diagnosis are essential for the practitioner to safely and effectively counsel patients as to safe and effective choices in herb use.

A second problem commonly experienced with the public is the belief that if a little of an herb (or medicine) is good, then more must be better.

A well-publicized example is the herb Ma Huang (Ephedra) which is being used for weight loss or as a stimulant. Serious adverse reactions including death have occurred and, in most cases, the people involved were foolishly taking 2-4 times the recommended dosage.

Many herbs are useful and safe in small, appropriate doses but as with any medication overdoses can cause unwanted side effects, possible injury, and, if the statistics are correct, rare fatalities.

THE DANGERS AND TOXICITY OF HERBAL MEDICINES

This book is divided into two sections, one on herbal products, the other on nutritional supplements. They are not the same. A recent hysterical report claimed that herbal products could cause Bovine Spongiform Encephalitis (BSE) also known as mad cow disease. The author failed to notice that herbs are from the vegetable kingdom and do not contain animal tissue. The author of this report is correct in noting that some supplements do contain animal glandular tissue such as liver, thymus, bone marrow, thyroid, and that the possibility of contamination by infectious proteins from these products may exist. If we are going to critique herbs and supplement products, let us do it with clear knowledge and understanding of the topic.

It is not uncommon for studies to be done on animals and the results extrapolated to humans even though we may metabolize or digest various phytochemicals quite differently. Researchers have done studies on a herb without authenticating its identity making results meaningless (Leung A, 2000).

It is not uncommon for information on isolated constituents to be confused with the whole herb or studies on I.V. forms of herbs to be confused with oral administration. This type of misinterpretation and misunderstanding gives rise to incorrect data which often continues to be repeated even decades after the original research has been disproven. Other studies have taken hamster oocytes and human sperm, put them into extracts of herbs (St. John's wort, Saw Palmetto, Ginkgo, and Echinacea) and found that in high concentrations some of the herbs denatured the sperm or inhibited the sperm from penetrating the hamster oocyte (Ondrizek PR, et al, 1999). This study was widely reported in medical journals and the popular press (NY Times). One medical editor said it was an important study showing a possible correlation between infertility and the use of herbs. The author of the study, Dr. Richard Ondrizek, was "flabbergasted" that his in-vitro laboratory research is being reported as evidence that these herbs can cause infertility in humans. Dr. Ondrizek stated, "there is absolutely no parallel between this study and humans".

Another recent error is due to lack of knowledge about phytochemistry. Several reports have surfaced suggesting Echinacea may be hepatotoxic. There is no evidence of this whatsoever. The error comes from the fact that Echinacea contains very small amounts of pyrrolizidine alkaloids, some forms of which are known hepatotoxins. Unfortunately, the authors of this misinformation failed to differentiate between unsaturated (hepatotoxic) PA's and the non-toxic saturated PA's found in Echinacea. An easy error for the uninformed to make, but one that creates unnecessary fear and confusion.

According to the information gathered by acclaimed researcher and scientist, Dr. James Duke, PhD, the statistics on deaths caused by herbs compared to other causes is quite revealing:

Herbs	1 in 1,000,000
Supplements	1 in 1,000,000
Poisonous Mushrooms	1 in 100,000
NSAID's	1 in 10,000
Murder	1 in 10,000
Hospital Surgery	1 in 10,000
Car Accident	1 in 5,000
Improper Use of Medication	1 in 2,000
Angiogram	1 in 1,000
Alcohol	1 in 500
Cigarettes	1 in 500
Properly Prescribed Medications	1 in 333
Medical Mishap	1 in 250
Iatrogenic Hospital Infection	1 in 80
Bypass Surgery	1 in 20

If put into perspective, herbs ("food herbs" and "medicine herbs") can cause problems but they are substantially safer than over-the-counter and prescription medications. Will we find some herbs can have side effects? Definitely. Will we find some herbs interact with medications? Absolutely. We only have to look at a recent report of St. John's wort reducing the blood levels of cyclosporin in heart transplant patients to be aware of possible risks. At the same time, reports that followed stating that St. John's wort can interfere with birth control and would cause an epidemic of unwanted pregnancies were unfounded. Not only is there no proof of this, but millions of German women who take contraceptive pills and St. John's wort have failed over the past 20 years to provide any substantiation to the concerned researchers.

Recently the FDA removed two medications from the marketplace (Rezulin and Propulsid) even though they had been through extensive testing and FDA drug approval. Ask any drug researcher and they will tell you that for many pharmaceuticals the real test is when they are being used by the general population. Both of these medications were deemed "safe", but caused serious adverse effects and ultimately 60-70 deaths each. One benefit of the long history of human use of most herbs is that they have hundreds or thousands of years of use within the general population and a substantial record of safety or danger, effectiveness or lack thereof.

Frequently we hear complaints that herbs are poorly studied and, as such, are dangerous. It's true the research on most herbs cannot compare to the ten years of FDA clinical trials required for new drugs. Since herbs are rarely patentable it is highly unlikely that any company is going to invest the time (approximately 10 years) and money* to have a herbal product approved as a new drug. Herbs and supplements are sold in the U.S. as dietary supplements with no research necessary before being sold. There are significant numbers of studies being performed on herbal medicines but the vast majority are done in Germany, France, Japan, China, India, and many are hard to access or never translated in English. It would be of tremendous benefit to consumers and clinicians if American companies would increase funding for well-designed and relevant herbal research. The quality of this research would also benefit by having clinical herbalists who understand appropriate forms of the medication, dosage, traditional, and clinical uses be a part of the research team. In 1997, a study was done on the effects of the Chinese herb Dong Quai on menopausal symptoms (Hirata JD, et al, 1997). This herb is frequently utilized in TCM formulas for female reproductive problems. While the study clearly showed Dong Quai had no estrogenic effects and did not affect menopausal symptoms, it failed to understand why and how this herb is used in Chinese medicine. First, Dong Quai is never used as a simple.

* approximately \$350 million to \$500 million dollars

It is not used for its estrogenic effects, but for its ability to improve cardiac function, increase uterine circulation, reduce anxiety, and mildly stimulate bowel function. Someone who understood this could have helped to design a much more useful and beneficial study.

The gold standard for proof of efficacy for a medication is the controlled double-blind trial. Many herbs, probably the majority, have not been subjected to this type of study. While these studies are very valuable and may offer proof of activity and effectiveness, we need to also understand the usefulness of other types of herbal data.

In addition to controlled double-blind trials and meta-analysis, less definitive but still valuable are well-designed unblinded trials, small uncontrolled clinical trials, population (epidemiological) studies, as well as some animal and phytochemical studies.

The herbalist should use all of these resources but also incorporates additional information often ignored by academicians. Traditional herb use, ethnobotanical use, and practical clinical experience are extremely valuable tools that stand as the basic foundation of good herbal practice. When you find three disparate groups of people using the same herb or closely related species for the exact same use you can be fairly certain that it does indeed have the stated effect. A good example would be *Coptis*, used as an effective antibacterial and antifungal agent by Native Americans, Northern Europeans, and the Chinese.

During the 1940's and 50s drug companies spent millions of dollars doing random drug screenings on plants, fungi, and soil microorganisms in search of the starting materials for new drugs. There were a few notable successes such as the Madagascar Periwinkle (*Vinca rosea*), the source of Vinblastine and Vincristine. All in all, the programs were failures. Rarely did any new drug develop from random screenings. In the last ten years, pharmaceutical companies have once again begun to search the plant kingdom for new bioactive phytochemicals but now they use ethnobotanists and even old herbals to do the preliminary searching (Holland BK, 1996). Why? Because they have realized that over hundreds or thousands of years indigenous people depended on these herbs to treat illness. Keen observers of their world native people used what worked. In addition to the knowledge of pre-literate peoples, the accumulated folk wisdom of Europe has been printed in books since the 1500's. While some of the information is exaggerated, some fantastical, and some totally wrong, much of this herbal wisdom is the basis for modern European phytotherapy and we are using many of the same herbs for the same conditions as did our distant ancestors.

Traditional systems of medicine such as Ayurveda (India), Traditional Chinese Medicine (TCM), Tibetan Medicine, Unani-tibb (Greco-arabic) and Kampo (Japan) have a long and impressive history of effectiveness. Modern research has now confirmed the usefulness and safety of what has been used as primary medical care by much of the world's population.

In the United States, Eclectic Medicine was practiced widely from the 1830's until 1940. This sectarian medical system was founded by a physician, Wooster Beach, MD, who rejected the mainstream medical practice of bleeding, leeching, purging, and using toxic medicines such as arsenic and mercury (Winston D, Dattner A, 1999). As an alternative, Beach and his followers embraced and studied the "American vegetable materia medica". Eclectic physicians during the 1890's constituted 10% of the total number of doctors in the U.S. Their clinical experience of treating millions of patients over one hundred years was carefully chronicled in their voluminous literature. Today this is an extremely valuable body of experiential knowledge, the successful clinical use of herbal medicines, in a time without antibiotics or the advances of technological medicine.

Modern clinical herbalists in the U.S. and even more so in Great Britain and Australia (where herbalists are recognized practitioners) have also begun to carefully chronicle their clinical experience and even to conduct small scale clinical studies of herbal treatments.

All of this data is valuable and, along with personal clinical experience, gives the individual clinician a strong understanding of the appropriate, safe, and effective use of a herb or herbal protocol. In my own clinical experience working from this accumulated knowledge is a highly accurate way of matching effective protocols to each patient.

Where this type of proof doesn't work well is when physicians I consult with call wanting to know about which herbs may be useful for liver transplant patients, patients undergoing dialysis or someone who has just had a bone marrow transplant. In these instances, where there is no tradition, our only guide then must be careful observation and research studies.

THE DIFFERENCES BETWEEN ALLOPATHIC USE OF HERBS AND TRADITIONAL HERBAL MEDICINE

As I mentioned earlier in this introduction, over the past ten years certain herbs (Black Cohosh, Echinacea, Garlic, Kava, Milk Thistle, Saw Palmetto, and St. John's wort) have become very popular but herbal medicine has not.

There is a very real difference between the Allopathic use of a herb and the practice of good herbal medicine. Different systems of herbal medicine have their own views and distinctive practices, but they all have 3 things in common. First they have an underlying philosophy that creates a foundation and structure for the practice of medicine. Frequently, the underlying belief focuses on what naturopathic medicine calls *Vis Medicatrix Naturae* or the healing power of nature (Kirchfield, Boyle, 1994). This idea was a central tenet of medicine as taught by Hippocrates, Maimonides, the German physician C.W. Hufeland, MD, and the early American physician Jacob Bigalow, MD. In many systems of medicine, not only is the body inherently self-healing, but there is an important relationship and connection between the physical, emotional, and spiritual aspects of each patient. In Chinese, Tibetan, and Cherokee medicine (Nwoti), attention may also be given to what we perceive as external relationships and the effects of the family, community and the environment on each patient.

The second and third aspects of traditional systems of medicine are interrelated, A system of Energetics and Differential Diagnosis. Energetics is a way of describing the activity and qualities of a given herb. Does it increase (stimulate) or decrease (sedate) function, does it increase nutrition, tonify an organ or moisten or dry tissue. Energetics is an effective way of understanding a herb not by its constituents, which can be very problematic*, but by its activity and effects on the human body. This traditional form of pharmacology is utilized along with various types of differential diagnosis, so there is an understanding of the underlying imbalances or disease and the treatment is specific to the patient. Good Herbal Medicine treats people, not diseases.

In consulting and educating physicians and nurses, they are always surprised that the protocols are so patient specific. Two different patients, both with Rheumatoid arthritis (RA), can have almost entirely different treatments. Why? Well most clinical herbalists do not see two cases of RA. They might see John Smith, age 68, with achlorhydria, chronic constipation, impaired circulation, and RA very differently than Alice Jones, age 38, who experiences severe PMS, depression, biliary dyskinesia, and has RA. The focus in good Herbal, Naturopathic, Chinese, or Ayurvedic medicine is affecting the terrain. Strengthen the organism, improve overall function (circulation, digestion, elimination, endocrine and immune function), reduce stress, and improve sleep and nutrition. Many diseases, especially chronic degenerative diseases, respond very well to this type of treatment. Benign Prostatic Hyperplasia (BPH) is a good example. The orthodox treatment is Hytrin® or Finasteride. Saw Palmetto as an allopathic herbal substitute works about as well as the pharmaceuticals, costs less, and has fewer adverse effects. As a herbalist I will probably use Saw Palmetto as a part of my protocol, but in addition I might add Nettle Root, White Sage, Bidens, or Collinsonia to improve activity, effectiveness, and specificity of the formula. This combination of herbs in my clinical experience is far superior to the pharmaceutical agents or Saw Palmetto as an individual remedy. Herbal Medicine, like orthodox medical practice, is an art as well as a science. Knowing how to combined herbs together to create a synergistic effect is more than random polypharmacy.

* individual constituents can have widely divergent effects as isolates. Chinese Ginseng (*Panax ginseng*) is a good example; Ginenoside Rb1 is sedating while Ginsenoside Rg1 is a CNS stimulant. Despite these opposing effects, the whole herb has an overall stimulating effect

Another example of a herbal formula having superior benefits over individual herbs would be my protocol for seasonal affective disorder (SAD). St. John's wort is touted as an effective herbal antidepressant and in some cases it is. For SAD St. John's wort alone is inadequate. In this situation combining Lemon Balm and Lavender with St. John's wort increases its benefits while also improving digestion and sleep quality. Other dietary and lifestyle changes would be considered as well as additional herbs specific to the patient.

It is also important to recognize that serious acute illnesses such as MI's, bacterial meningitis, stroke, acute asthma attacks, head trauma, liver and kidney failure are not treatable in this manner. For many years both patients and practitioners have tended to view this difference in treatment paradigms as a choice - one or the other. Nothing could be further from the truth. Where Western medicine is most effective, herbal medicine is often ineffective, but where herbal medicine is most effective, orthodox medicine often has little to offer patients. Not only can the use of botanicals be very useful in many chronic degenerative or mild to moderate functional ailments, they also can have an important role to play in recovery from serious illness. Once head trauma victims have been stabilized, the use of Ginkgo, Rosemary, St. John's wort and Bacopa have dramatically reduced recovery time, and improved memory as well as cognitive and motor functions.

Western medicine and herbal medicine working in concert offers the best of both worlds and the patient is the beneficiary in this new relationship.

ADMINISTRATION OF HERBS

Herbs as medicines can be administered in many forms. Some can be taken as foods, consumed regularly in the diet, like Basil, Blueberries, Garlic, or Ginger.

Teas (infusions or decoctions) are a reliable way of administering some herbs. Drinking a hot cup of a pleasant tasting tea can be a wonderfully relaxing and healing experience in itself. Liquids are also absorbed more quickly, especially in patients with impaired digestion. For certain herbs (Green Tea, Slippery Elm) tea is the most effective way to take them. The drawbacks to teas are that many herbs have constituents that are poorly water-soluble (Boswellia, Ginkgo, Gum Guggal, Milk Thistle) and are not effective as teas. Other herbs have an unpleasant taste (Saw Palmetto, Feverfew, Valerian) and getting patients to drink cupfuls of a noxious tasting brew will limit patient compliance. Some patients will also find having to make teas too much of a bother.

Tinctures are hydro-alcoholic extracts of herbs. While not very concentrated (1:5 w/v), tinctures have the benefits of being a liquid, the menstruum (alcohol and water) extracts a wide range of constituents, alcohol increases absorption of the herb by approximately 30% (Mediherb, 1998), the doses are much smaller than with teas, so the taste factor is less of a problem, and they are convenient. A patient can carry a small 1-oz. dropper bottle and the tincture can be placed in water, tea, or juice when needed. An additional benefit to tinctures is that fresh herbs that lose potency when dried (Echinacea, Eyebright, Scullcap) can be made into fresh tinctures (1:2 w/v) which preserves their activity very effectively. The biggest limitation for tinctures is that they contain alcohol and people with alcohol abuse issues or serious liver disease should avoid its consumption.

Fluid extracts are more concentrated alcohol and water extracts (1:1 w/v) and they offer many of the same benefits as tinctures, with greater potency and a smaller dosage. True fluid extracts are not common in the American marketplace and there is great confusion as different manufacturers use different terminology, technology, and menstruums (extracting liquids) to produce their products. The Pharmaceutical definition of a fluid extract includes the use of heat in the manufacturing process, which can be useful for heat soluble constituents or damaging the heat sensitive constituents.

Spray-dried extracts are liquid extracts that are spray-dried onto a powdered carrier (cellulose, powdered herbs). These extracts are fairly concentrated (4:1, 5:1, w/v), maintain the activity of the whole herb, and are easily encapsulated, so taste is not an issue. The drawbacks of capsules in general, whether they contain ground herbs or a spray-dried extract, is they are more difficult to digest than liquids and patients, especially young children, who can't swallow capsules cannot use this type of product.

Capsules containing ground, dried herbs tend to have very limited activity and digestibility. Herbs that should be taken in this form are ones containing minerals as primary constituents (Alfalfa, Horsetail, Nettles, Oat Straw). As long as the patient has reasonable digestive function, capsules are a superior way to ingest mineral rich herbs.

Gelcaps are a useful method of ingesting oily nutrients like Vitamin E or oil based supplements such as Borage Seed Oil, Flax Seed Oil, or Evening Primrose Seed Oil. Gelcaps are easier to swallow than capsules or tablets, but the ingredients are subjected to considerable heat during processing and rancidity of the oils is a substantial problem.

Tablets are often difficult to digest, but greater amounts of herbs and herb extracts can be squeezed into this format. Uncoated tablets are harder to swallow, but are more absorbable. Most tablets contain proprietary herb/supplement formulas and their effectiveness is dependent on the quality of ingredients and the validity of the formula as a therapeutic regimen.

Standardized herbal products are frequently recommended in the literature, especially by authors who are not herbalists. The idea that each dose of a herb has the exact same levels of active constituents is an attractive concept and a comfortable one for practitioners used to dealing with pharmaceutical products. You need to know that 0.25 mg of Lanoxin is exactly that. Too much can cause arrhythmias and death, too little and the patient may die of congestive heart failure. The majority of herbs are not used for life threatening conditions, nor do they have the toxicity of Lanoxin, so dosages do not need to be as precise. The belief that each herb has an active constituent is false - most herbs have dozens or even hundreds of constituents that may contribute to its activity. Some of the constituents may have direct activity, while other "inert" ingredients may increase bioavailability, reduce toxicity, or stimulate function via a synergistic activity. To most herbalists, the active constituent is the herb itself. Many manufacturers and academic "herbal authorities" would have you believe that only standardized herbal products work and that all herbs should be standardized, this is disingenuous and more about marketing and belief system than fact. The reality is that less than 10% of the standardized products in the marketplace are standardized to known active constituents. There are actually two types of "standardization". The first is true standardization, where a definite phytochemical or group of constituents is known to have activity. Ginkgo with its 26% Ginkgo flavones and 6% terpenes is a good example of real standardization. Other products that meet these parameters are Milk Thistle, curcumin from Turmeric, Coleus forskolii, and Saw Palmetto (85-95% fatty sterols). These products are highly concentrated; they no longer represent the whole herb, and are now phytopharmaceuticals. In many cases they are vastly more effective than the whole herb (Coleus forskolii, Ginkgo, Milk Thistle), but some effects of the herb may be lost and the potential for adverse effects and herb/drug interactions may increase. Curcumin* may have stronger antiinflammatory activity than whole Turmeric, but in large doses it acts as a gastric mucosa irritant, where the whole root extract has a gastroprotective effect.

The standardized Saw Palmetto (Serenoa) is believed to be much more effective than crude extracts of the berry, but again no comparative studies have ever been done. The dried berries and tincture, in addition to reducing BPH symptoms, have beneficial effects on the immune system, lungs, and GI tract, which are lost in the standardized Saw Palmetto.

The other type of "standardization" is based on manufacturers guaranteeing the presence of a certain percentage of a marker compound. Rarely are these known active constituents and while they may help to identify the herb, they are not indicators of therapeutic activity. An Echinacea product standardized to caffeic acid or a St. John's wort product standardized to 0.3% hypericin is virtually meaningless. Neither of these compounds represents the therapeutic activity or quality of the herb. This is not to say that no quality standards are needed - they most certainly are. First, every herb product needs to be botanically identified to make sure the correct herb is in the product. Adulteration of Scullcap with Germander has resulted in liver damage in several people.

* There are no studies comparing the activity of one to the other and many additional antiinflammatory constituents of Turmeric rhizome have been discovered since the curcuminoids were deemed "the active ingredients"

Recent substitution of *Aristolochia* species for the Chinese herb *Stephania* has caused kidney failure and renal cancers.

In addition to accurate botanical identification it is very important that the right part of the plant is used, that it is harvested at the right time, prepared properly, and the appropriate pharmaceutical techniques are utilized to make the best medicines.

Herbalists have always standardized their herbal products. St. John's wort was gathered in bud or flower and only the tops of the plants picked. The tincture or oil of hypericum should turn a deep burgundy red and have a strong and distinctive aroma. How much hypericin is present per dose, I don't know; how much hyperforin per dose, I don't know. What I do know is this preparation will be active and will work because the markers herbalists have always looked for are present. Herbalists have standardized their medicines to quality, not numbers.

As the herbal marketplace continues to grow, simply using the old quality standards probably isn't practical. I would suggest that simply applying random levels of an easy to test for phytochemical isn't the answer either. A synthesis of traditional herbal knowledge and modern research will benefit the herbal manufacturer, the consumer, and the practitioner.

The bridge between traditional herbalism and modern phytotherapy and the interface between academia and industry needs to be a person who has spent their lifetime gaining a hands-on practical knowledge of botanic medicine - the herbalist.

BIBLIOGRAPHY

Anonymous, Alcohol Improves Bioavailability, *Mediherb Monitor*, 1998.

Eldin S, Dunford A, *Herbal Medicine in Primary Care*, Butterworth-Heinemann, Oxford, UK, 1999.

Kirchfield F, Boyle, W, *Nature Doctors, Medicina Biologica*, Portland, OR, 1994.

Hirata JD, Swiersz LM, et al, Does Dong Quai Have Estrogenic Effects in Postmenopausal Women? A Double-Blind Placebo-Controlled Trial, *Fertility and Sterility*, 68(6): 981-986, 1997.

Holland BK [Ed.], *Prospecting for Drugs in Ancient and Medieval European Texts*, Harwood Academic Pub, Amsterdam, The Netherlands, 1996.

Lueng A, Scientific Studies and Reports in the Herbal Literature: What are we studying and Reporting?, *HerbalGram*, 48:63-64, 2000.

Ondrizek PR, et al, An Alternative Medicine Study of Herbal Effects on the Penetration of Zona-free Hamster Oocytes and the Integrity of Sperm Deoxyribonucleic Acid, *Fertility, and Sterility*, 71(3): 517-522, 1999.

McCaleb R, Research Reviews: Possible Shortcomings of Fertility Study on Herbs, *HerbalGram*, 46, 1999.

Winston D, Nwoti, *Cherokee Medicine and Ethnobotany*, in Tierra M, [Ed.], *American Herbalism*, The Crossing Press, Freedom, CA, 1992.

Winston D, Dattner A, The American System of Medicine, *Clinics in Dermatology*, 17(1): 53-56, 1999.