

INTRODUCTION

Welcome to Advanced Herbology II - *the Chemistry of Plants*. The use of herbs in North America for medical purposes is experiencing a rapid renaissance. In March of 1997, *Managed Pharmacy Report* devoted an article to the growing interest and demand for botanical medicines by the public. The implications of this demand for institutions and individuals in the health care system are significant. The time to prepare, with education and a strategy for implementation, is now.



Echinacea
(*Echinacea spp.*)

The figures for interest in this area seem to be increasing rapidly. One of the most thorough reviews of this expansion at this point is in *JAMA* (Journal of the American Medical Association) Nov. 11, 1998. It states that 4 out of 10 Americans were using some form of "Alternative Medicine". This includes 629 million visits to Alternative Healthcare practitioners, (up from 427 million in 1991). This figure far exceeds visits to primary care physicians. The out-of-pocket expenditures to the public is marked conservatively at \$27 billion dollars. This exceeds out-of-pocket expenditure for all US hospitalization.

More comprehensive studies were done by the Center for Health Statistic (CDC) and the National Center for Complementary and Alternative medicine in 2002. The review of all CAM practitioner visits found the following:

- 74.6% had used some form of complementary and alternative medicine (CAM).
- 62.1% had done so within the preceding twelve months.
- When prayer specifically for health reasons is excluded, these figures fall to 49.8% and 36.0%, respectively.
- 45.2% had in the last twelve months used prayer for health reasons, either through praying for their own health or



through others praying for them.

- 54.9% used CAM in conjunction with conventional medicine.
- 14.8% "sought care from a licensed or certified" practitioner, suggesting "most individuals who use CAM prefer to treat themselves."
- Most people used CAM to treat and/or prevent musculoskeletal conditions or other conditions associated with chronic or recurring pain.
- "Women were more likely than men to use CAM. The largest sex differential is seen in the use of mind-body therapies including prayer specifically for health reasons".
- "Except for the groups of therapies that included prayer specifically for health reasons, use of CAM increased as education levels increased".
- The most common CAM therapies used in the US in 2002 were prayer (45.2%), herbalism (18.9%), breathing meditation (11.6%), meditation (7.6%), chiropractic medicine (7.5%), yoga (5.1%), body work (5.0%), diet-based therapy (3.5%), progressive relaxation (3.0%), mega-vitamin therapy (2.8%) and Visualization (2.1%)

In 2004, a survey of nearly 1,400 U.S. hospitals found that more than one in four offered alternative and complementary therapies such as acupuncture, homeopathy, and massage therapy.

In a 2007 survey done by the NIH's National Center for CAM, we saw this number increase again by an additional 2%.¹ In the latest figure, natural products like Herbal Medicine takes over the number one spot. According to a 2010 study in Canada, we are experiencing a similar trend.²

It may seem that herbal enthusiasm is a recent fad. However decades of scientific research on plants, and the insights drawn from many cultures from around the world, have led to greater awareness

that botanical medicine is a safer, and less expensive health care. The World Health Organization notes that over 80% of the world's population use traditional healing as a primary form of medical care. North America is simply returning to a form of medicine which it set aside three generations ago. The roots of herbal medicine are still vital.

What are the origins of the interest in herbal medicine?

1. A desire for greater involvement in one's health
2. A desire to use less expensive, more preventive methods
3. A greater comfort with natural substances over those that seem remote and artificial.

As we shall see in this course, botanical medicines actually run the gamut from a soothing cup of Chamomile tea before bedtime, to very sophisticated extracts created to stimulate particular portions of the human immune system. It would be a mistake to either romanticize, or underestimate, the role of botanical medicines in coming years. Just as many pharmaceuticals of past years were directly or indirectly developed from plant analogs, the future of plant medicines promises to be influential in the most modern developments of medical care.



This course offers you something above and beyond what you can find in books or other continuing education materials on herbs — the insights drawn from over thirty-five years of practical experience as a clinical herbalist. Today, herbal medicine draws from three sources: science, folklore and clinical application. If any one of these sources is missing, it is like a two-legged stool. The perspective lacks a solid foundation.

It's important to get the opinions of plant chemists, pharmacists, and ethnopharmacologists on the dosages, toxicity, and contraindications for a particular herb ... but there's something to be said for having dealt directly with the public's use of that herb over a period of years. The insights gained in clinical practice help round out this course. And only a clinical herbalist with an active practice can offer those insights. While this course will present a great deal of scientific information, and will review folklore and traditional uses from

around the world, please keep in mind that the recommendations and conclusions on particular herbs are the result of my personal experience with an urban North American population.

When I began my university career, the opportunities to learn herbal medicine in a formal setting were virtually non-existent. I learned by apprenticeship and through years of research and interaction with people. Nowadays, however, there are formal herbal training programs at naturopathic colleges, acupuncture colleges, and at distinct herbal colleges. Virtually all medical schools in the U.S. offer some kind of introduction on complementary alternative medicine (CAM) to their students and the quality is increasing rapidly. The medical schools regularly hold extension courses in herbal medicine for med students, nurses and practicing physicians. In our classroom courses at Wild Rose College we are finding more and more health care professionals. The signs are clear. In the 21st century, an increasing number of health care providers will use, or be familiar with, botanical medicines. Herbalists will often be the intermediaries between the plant kingdom and the other practitioners. Will we be seeing medical doctors working hand in hand with clinical herbalists or will they continue to travel down separate roads, being two distinct fields? Time will tell the answer to this, as well as many other questions.

Four issues need to be kept in mind as you read the materials in this course.

- 1. The interest in herbal medicines is expanding rapidly.**
- 2. There are a growing number of herbs, herbal sources, and herbal manufacturers. Quality varies dramatically.**
- 3. The use of herbs is governed by many different, and sometimes conflicting, schools of medical thought.**
- 4. Access to timely and accurate information on herbs has not been consolidated at the national or international level. It will resist easy categorization.**



Keeping these issues in mind, the reader will find this course is structured to provide workable solutions. I have presented the material as even-handedly as possible but I should make my biases clear. This course outlines what has been called "modern herbology," a blend of the Western scientific approach with folklore and traditional usage and definitions. This synthesis is a work-in-progress. It certainly has no formal dogma, but the large numbers of herbalists who bridge the worlds of science and tradition have assembled a significant body of information in the last thirty years. Most of what the public reads about herbs in popular magazines can be linked to the "modern herbology" tradition. Most magazines and media refer to individuals from this tradition when practical questions about herbs come up. The "modern herbology" approach to plants is only one form of botanical medicine. You will run into styles of herbal practice or herbal commentary that draw on very rural or folk traditions. There are schools of thought who believe that spiritual or esoteric principles govern the use of herbs. Herbs, like cooking, seem to bring out people's hopes, eccentric appetites, and creative inspiration. We will be discussing several of these traditions later in this introduction. The goal for a course such as Advanced Herbology II is to give you a roadmap for understanding and working with all that variety.

1. The interest in herbal medicines is expanding rapidly.



The herbal business in the United States in the fall of 1998 was estimated to be a \$4.3 billion dollar industry annually. These numbers reflect a 32% annual growth rate during that time. This growth rate has been reduced to a modest 3 - 4%, with annual sales being 4.8 billion dollars by 2008. This is really a small fraction of the world herbal market 19 billion for supplement sales and 83 billion if you include soy, algae and fiber. When you include pharmaceutical drugs derived from botanicals you can add 44 billion dollars and herbal beauty products another 14 billion dollars.

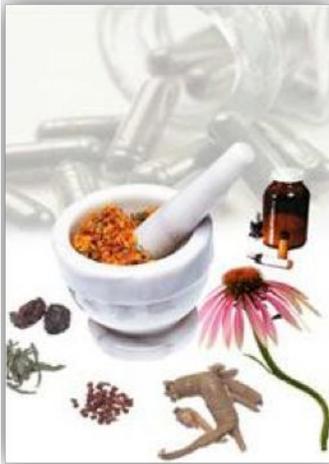
Part of what is driving this interest is the support which modern science is giving for the pharmacological effects of botanical products, whether raw herbs, extracts or specific phytochemicals. Increasing sophistication of plant science and the ability of botanists and pharmaceutical scientists to look at the key constituents of plants is giving us a great deal of information about why herbs have a medicinal impact. The search for anticancer agents has led clinical scientists to examine many medicinal species of plants from around the world. In turn, their research has become the foundation for a much deeper understanding of the way herbs can affect the human body.



An article in Newsweek (May 12, 1997) on the growing interest in St. John's Wort as an antidepressant is a good example of how botanical use has expanded into the North American health care system. Use of the plant in Europe over many years led to standardized products and a series of controlled studies with animals and humans. The openness, even eagerness, of the public to use herbs rather than standard pharmaceuticals supported clinical trials. In April of 1997, St. John's Wort was not even in the top 100 selling herbs in the US. By the end of 1997 it was in #1 position, out selling #2 (Echinacea) by more than double. Interestingly, even by Oct 1998 it was still only #2 in Health Food store sales, indicating that more than half of all sales are outside of "normal Health Food store" channels. Extensive clinical trials seem to support the balanced use of the botanical product in some clinical settings. The body of European information has sparked the interest of North American clinicians. We see similar cycles of research, investigation, and public support for plants such as Ginseng, Gingko, Garlic, Aloe Vera, Kava Kava, and Echinacea. Japan, India, and Europe continue to explore botanical medicines at a much more rapid pace than North America.

This phase of rapid growth in North American herbal use is built on the expansion of scientific knowledge and the greater exchange of traditional information from around the globe. Health care professionals need to accept the fact that herbal information will change and evolve almost as quickly as the practice of Western medicine in the coming decades.

2. There are a growing number of herbs, herbal sources, and herbal manufacturers. Quality varies dramatically.



The herb business has always been global. The history of our planet is intimately linked with the commercial demands for spice, for tea, for coffee, for opium and food crops. Now, with the increased opportunities for trade in an expanded herb market, it is entirely likely that herbs from Africa, Europe, Asia, Australia, and the Americas are available in your community. Herbalists themselves are struggling to keep up with the wave of new herbs. Most practicing herbalists will rarely stray beyond the use of 100 or so herbs simply because of the complexity of managing the details. What is important to know is that globalization has meant the most prominent herbs are always changing! Many are part of traditional Ayurvedic (East Indian) or traditional Asian (China, Japan, Korea, southeast Asia) materia medicas. We will examine the basic concepts of some of these traditions later in this introduction before we go on to Western application of modern herbal medicine. These medical traditions can include minerals and animal parts which aren't covered in this course because they aren't ordinarily thought of as herbs. For practical reasons though, this course does include discussion of medicinal mushrooms and algae which are usually lumped in with botanical medicines.

One should be aware that the manufacturing techniques used to create botanical products range from minimal sanitation and quality control, to the most elaborate extraction and fractionation techniques available to food chemists. As noted earlier, the challenge to the herbalist is to respond sensibly to products, which may range from "Grandma's Kitchen Garden Blend" to an exotic phytochemical extracted with great skill and at great expense.



Today one of the biggest trends is to move toward guaranteed potency or standardized process botanicals. We now have the ability to produce high quality extracts from herbs that have been in traditional use for centuries. Using sophisticated analytical techniques, such as High Performance Liquid Chromatography (HPLC), it is possible to identify and measure many of the key biochemical constituents in these herbs. Measurement has assisted standardization in cultivation, processing and packaging. Again, professionals will need to be aware of the circumstances where standardization is preferable, and those where it is critical.

This analytical approach has confirmed (as traditional herbalists have always known) that the quality or key constituents of an herb variety can vary from one batch to another, depending on growing, harvesting, storage, and extraction conditions. For a professional herbalist, the most important element of their practice is the tools of their trade – the botanicals. We want to know that the quality is both high and consistent. Coping with the variety of sources, quality, and analytical validation is part of making a practice work.

Is Standardization just another marketing tool?

Standardized products (standardized/guaranteed potency) -- good news or bad news? There is no easy answer to this. Well over 50% of the information on this subject is biased by marketing positions related to financial gain, and contains little scientific or, more importantly, clinical evidence. My view is somewhere in the middle of the road as I feel there are both positives and negatives to standardization.

One of the major reasons for standardization is the hope of creating a better product. Does it always do this? Not really. Sometimes it creates a better quality, sometimes not. One of the biggest problems is that there are no standards on which to base standardization. Critics of the herbal industry often have stated that until a practitioner can get good reliable, repeatable results in a scientific manner, the herbal industry will never gain the respect of mainstream medicine. Standardization is an attempt to answer these



critics, but I feel it falls quite a bit short of its mark. Is there a better way? I think so, but let's first look at the issues and their evolution.

Herbalists in North America and around the world have always had standards to maintain. These standards, for centuries, have reflected the tools available at the time. They included the season in which the herb is picked, the ripeness, the taste, smell and appearance. This was further supplemented with drying, storage, and processing of the botanical matter before it was given to the patient. We still find these standards in place in the production of a fine wine or a Cuban cigar. Quality is demanded, and thus produced, by the connoisseur. Do we want anything less for our herbal medicines?



Quality of the original botanical material is the most important factor. We don't want to lose that by moving our attention toward a chemical standard. Machine harvesting of 1,000 acre fields of St. John's wort will not get the same quality of leaf-to-flower bud ratio as hand-picked herbs. The flowers mature at different rates. On my farm, we harvest St. John's wort 6 - 8 times throughout the season to assure the quality. To say a product is standardized to 0.3 % hypericin content is a joke. In fact the hypericin content of the St. John's wort that grows on my farm is 0.7%. We are lead to believe by having a number associated with it, makes it better. It was proven in 1996, long before it expanded sales trend, that hypericin is not the active ingredient. However this is not to say that some standards are not useful. Let's say you get up in the morning after very little sleep. You go to the coffee pot to get some wake-up juice and find it is decaffeinated. All of a sudden, one of the active ingredients is important to you.



One of the biggest questions is - What active ingredient do we standardize to? I have been interested in the biochemistry of plants for decades. Heck, I wrote a series of three textbooks on the subject. It holds great fascination to me. But it is not the whole issue. We really don't know all of the active ingredients of many botanicals. As an example, the 'active ingredient' of Valerian has changed five times in the last ten years. There are hundreds of thousands of different chemicals in each cell of a plant. To say we know the entire interaction is absurd and is, at the least, arrogant of us to presume

this knowledge. Maybe the great architect in the sky has the answer to this question, but I can say this herbalist doesn't.

It is really interesting to understand how a spark plug fires the engine of a car and it is easy to say it is an active ingredient of a car, but to standardize a car purchase to a spark plug would be pretty absurd. When I buy a car I want to know it has spark plugs, but I also am looking for a few other things such as an engine, tires, a steering wheel and maybe even a rear view mirror. Perhaps when looking at a herb, we should take into consideration a larger array of the active and marker chemicals. This is a concept called fingerprinting, to connote a large array of important chemicals. Instead of looking at hypericin content in St. John's wort, let's include pseudohypericin, hyperiforin, biapigenin, quercitin and quercitrin in the spectrum of important ingredients. This is basically the difference between a standardized product and a guaranteed potency product. This can give us a better look at how the environment treated the plant instead of just looking at one single standard.

In an attempt to explain this to my students, I came up with the following stories. One of my clinics in the mid-90's was in Vancouver, Canada where I had members from a popular Sci-fi television show, 'The X-Files' as patients; this analogy comes out of the X-Files, so please bear with me. Let's say we are in a boardroom with closed doors. We are talking about extraterrestrial life and an alien beams into the middle of the room.

He looks around and tries to figure out what these human beings are? What is their active ingredient? One of the people gets up, runs to the door, turns the door handle, and disappears from the room. The alien goes eureka! The active ingredient of a human is the hand.

Well, he goes up to the closest person, cuts off a hand, goes to the door and tries to open it. It doesn't work. Then he realizes the hand has to be connected to the whole person. This gets the alien studying hands more closely and he realizes over the next few months that some hands are good at painting, others are good at pitching balls and still others are good at playing the piano. It is the personality of



the whole person that shows how the hand works. Similarly it is not a single ingredient that makes an herb work - it is a group of factors. The true active ingredient of St. John's wort is - - - St. John's wort!

While standardization has problems, it does have benefits. To say it is just a marketing ploy of the pharmaceutical industry's desire to take over the herbal market is like throwing the baby out with the bath water. As an herbal clinician, I want a certain quality of botanicals to use, may it be high quality tincture, standardized extract or herbs picked by the farmer down the road. It is understood that given chemicals can help produce a certain level of activity with patients. It is not the only factor at work though. There might be other active ingredients and most likely a synergistic action of several factors. The true test is how the herb reacts in my patient. Let's be perfectly blunt, if the pharmaceutical industry thought the single standardized 'active ingredient' was the reason for the whole medicinal action, they would isolate it, patent it, synthesize it and sell it to us as a single, high cost drug. They can't because there is much more to the picture and they know it.

Some feel that standardization is more along the lines of finger printing a plant. Standardization to a single data point such as hypericin is not finger printing. We need to look at a much larger spectrum of the constituents. Just as concerned parents might keep records of their children's finger prints to help find them if they got lost or kidnapped, we might want to finger print a botanical to make sure we get the right medicinal plant. By looking at a larger spectrum of important constituents of a plant we can create a finger print. This usually demands five or more active or marker constituents.

As children grow we find that they have certain talents and we might want to assist them in these areas by sending them to special classes to help improve their dance, violin or their football. Similarly, if we want a specific 'talent' of the botanical increased, we may want to concentrate it. This shouldn't be at the expense of all other important constituents though. The proof of the medicinal substance is how it works on our patients on a regular basis. It is important to note that even though we know the chemistry of a plant, it doesn't



mean it has to be concentrated. Black Cohosh, St John's wort or Vitex are rarely concentrated when sold as a standardized extract.

Understanding a botanical's chemistry doesn't mean we are getting further away from nature or losing our 'roots,' or losing touch with the "earth-centeredness of traditional medicine". This is like saying I'm losing touch with my children because I drive them to violin lessons or football practice.

All grape wines are standardized to the same basic alcohol content, using a single plant species, but there are several other factors influencing the quality of the wine. Certainly the 'year' is a big factor. A bright sun when the buds were full, high humidity, moderate cloud cover during ripening - all of these affect the final quality of wine. The way the grapes were picked and processed has a factor in the color, bouquet, and taste of the wine. These same factors affect the quality of our herbal medicines.

It is very important to realize just because we understand the chemical content of a plant and its relationship to an activity doesn't mean it works better. It doesn't mean that because a product label tells you information about its chemical content it will work better than one that does not have this information. Sometimes by knowing the spectrum of chemicals we can aid in concentrating it. We often concentrate the herb for convenience of consumption. Most people prefer to take two or three capsules instead of 20. Let's not forget these herbs are vegetable matter just like carrots. If I want the



therapeutic effect of 10 - 20 carrots, I will make carrot juice. If I were going after the antioxidant effect, it would help to know the mixed carotenoid content of the glass of carrot juice. The knowledge of the carotenoid content does not make it work better, but it helps me decide how many glasses I should drink and assures me I will get the desired action. Of course, sometimes it is nice to sit back and enjoy some carrot juice just because I like it.

Herbs have traditionally been available in four forms: teas (infusions), capsules/tablets, fluid extracts and tinctures. Each form has its own advantages. Teas are valuable because the



medicinal ingredients of the herb are in solution (menstruum), thereby allowing efficient absorption of the active ingredients. Fresh teas will contain constituents that are lost in other preparations. Capsules, on the other hand, are very convenient. They can be taken anytime and anywhere, and because the herb is encapsulated, any unpalatable taste is shielded. Tablets are also convenient and suitable for herbs and herbal formulas that are unpalatable. Fluid extracts and tinctures are valuable because they are the most potent form of the herb. They also store for long periods of time, and because of their strength, small doses are as effective as larger doses of the same herb in another form.

Each of these forms has its disadvantages however. Medicinal teas are often unpalatable and inconvenient, requiring special preparation. Patient compliance, and therefore effectiveness, will be lower than one would like. Encapsulated crude herbs, in spite of their remarkable convenience, are hard to digest because the active ingredients of the herb are trapped within cellulose "cages" with no menstruum to release the cell contents. Only an optimally functioning digestive system (something we seldom see) can fully release them. Fluid extracts and tinctures taste, in a word, terrible and are messy. If they are not handled with caution, stained clothes are often the result. Teas, tinctures and fluid extracts throw away the bulk herb after extraction.

One solution to the tradeoffs in the different preparation methods has been to extract the herb first, then encapsulate the dried extract. This offers the advantage of the whole herb, in a concentrated form, with the convenience of the 'pill' form. The big question is which method should be used to concentrate it and what chemical is used as a marker or standardized constituent for the concentration. Each herb has a set of active ingredients or chemical families. By determining how much of these ingredients we desire, we can create a "guaranteed potency" herb.

'Guaranteed potency' is both a simple concept and a complicated procedure. Through the use of new analytical technology, it is possible to examine the constituents of herbs and manufactured products with a subtlety previously impossible. In some herbs, like



Cat's Claw (a South American herb), we can find as much as 1000% difference in the amounts of active ingredients in different product lines. Goldenseal has shown 200-300% differences from one source to another. As mentioned earlier, gathering this information gives manufacturers (and ultimately consumers) a tool to judge how herbs should be grown, harvested, and prepared for end use.

The goal of concepts like guaranteed potency is to produce a more effective product. This can be a fairly expensive procedure and not all herbs are suitable for the guaranteed potency approach, so expect to see a combination of guaranteed potency and unassayed raw material in commercial formulas in coming years. Some herbs are more suitable for concentration of the whole plant. In others, only a portion of the plant or mushroom is used for product manufacture.

In this area, European pharmaceutical companies are way ahead of the North Americans. The global pharmaceutical corporations in anticipation of expanded demand have recently purchased many of these companies. The Europeans have researched and marketed a large variety of guaranteed potency single herbs in response to an unbroken medical demand through the 20th century. By blending the information offered by analysis and improved processing with the traditional methods of creating herbal formulas, a new generation of superior products becomes possible. North Americans do have something to offer the world. Because of the eclectic nature of our herbal medicine and our exposure to global cultural influences, we are often more eager to mix herbs, processes, and theoretical approaches to create new products.

Traditionally, an herbal formula has a master herb, with several 'helper' herbs. When possible in my own formulation design, I like to use a guaranteed potency herb for the master, giving it the strong support of other botanicals. In this way, the product combines the best of herbal tradition and the confidence that comes from using guaranteed botanical material.

After all is said and done, you have to try the formula out in the clinic to see how it works. Formulas often look good on paper, but



don't work well in practice. Once in a while, the reverse is true. They work much better than one ever expected.

The key in formulation is to combine guaranteed potency herbs with other useful herbs in a formula and confirm good clinical results. Note that this process of guaranteed potency is quite different from "standardization." Standardization typically adjusts the active ingredient in a botanical product to a fixed value, while guaranteed potency is more concerned with minimum values and keeping the active ingredients in ratios to the level desired. With standardization, you have to either "spike" the product, if the desired ingredient is too low, or take some away, if it is too high. This increases the direct manipulation of the botanical product during the manufacturing stage. With guaranteed potency we are working with the herb, concentrating it to a level that assures bioavailability and monitoring cultivation to ensure that crop quality is kept very high.

One important factor for manufacturing is faithfulness to current research and processing technology. This commitment ensures that key ratios of constituents are not disturbed. Guaranteed potency gives me the confidence that I'm using effective products as a holistic practitioner. Guaranteed Potency botanicals meet a standard that will give the desired results. While I'd never suggest that only Guaranteed Potency botanicals and products are useful, I'm convinced that this will be the approach used to bring botanicals into widespread use in hospitals, pharmacies, and private clinics. The benefits are really substantial at a clinical and quality control level.

This course can help your education into plant chemistry. It can point you in the direction of recommended and dependable reference materials. But it cannot pretend to teach you everything there is to know about herbs. And the list of herbs that you will need to be familiar with will change season by season. New discoveries in South America particularly have led to the introduction of many plants to the North American public in the last decade. For the professional, the key is to identify the common elements of handling, stocking, assessing, and prescribing botanical medicines. With that in mind, each new herb that appears, or each new formula that is



offered to the public, will have a familiar context. Depending on your style of practice and the requirements of your organization, you'll be able to judge what botanical or product is appropriate.



3. The use of herbs is governed by many different, and sometimes conflicting, schools of medical thought.

As noted above, the herbs or herbal formulas that appear in stores and pharmacies across the country are often the end result of very different traditions of medicine or botanical formulation. Fifteen years ago, my ability to recommend the Guaranteed Potency approach, for example, would have been severely limited by the technology available to manufacturers and formulators. The scientific literature alone would have been insufficient to support development. Innovations like the Internet, which allow rapid access and dissemination of scientific information, were a distant dream.

The toughest bridge for health professionals to cross, however, is between the non-academic, non-traditional physiology/medicine which underlies herbal formulas, and the practical questions which patients or consumers may have when trying to integrate herbs into their surgical or pharmaceutical regimen.

This is complicated by the fact that herbs in North America are very often used in formulas containing many ingredients. This is further complicated by the fact that botanicals are not single chemical substances, but a symphony of chemical ingredients reflecting a living substance harvested at a particular moment. For example, our best available science suggests that the activity of an herb such as Kava Kava relies on the ratio of seven kavalactones. No one ingredient appears to work by itself.

Similarly, you'll note the common phenomenon that each herb works on a variety of health issues. This concept is called the "polychrest" function of an herb (i.e., it works on a multitude of symptoms or conditions that might appear to be unrelated). Conventional pharmaceuticals are often seen in a similar light. The

recent increased use of thalidomide for conditions previously unimagined is a case in point and the concept of "off-label" usage is well-established in the medical profession.

Herbal usage has always been governed by experience. As your experience with herbs grows, your confidence in recommending them will increase. Senior herbalists, working one on one with a consumer, will often work with larger dosages or more elaborate formulas than one would recommend for self-care.

4. Access to timely and accurate information on herbs has not been consolidated at the national or international level. It will resist easy categorization.

It would be wonderful to have a single reference work at the national or international level that described herbs in an encyclopedic way in a Western scientific setting. Unfortunately, the cost and time required to assemble such a document has been prohibitive. There are some pharmacopoeias starting to appear but herbs are in the public domain and therefore cannot be patented. No commercial concern has an incentive to research or publish information on ordinary herbs. Every effort to create specialized extracts and conduct extensive scientific research in search of chemical analogs for pharmaceutical use draws energy and time away from the original botanical.

There is good news however. The attitude in North America has definitely shifted away from the view that "herbs are useless" or "herbs don't work." The pendulum has often shifted the other way ... with extreme safety concerns about relatively benign herbs. Somewhere in the middle is reality. Botanical medicines have the capacity to do great good. They need to be approached with enthusiasm, care, and respect. And solid information will benefit everyone ... the pharmacist, the doctor, the herbalist, the consumer, and the health care system generally.



Few governments have shown interest in the methodical collection of herbal information though again the Europeans have shown the lead in this area. The German "Commission E" documents offer the first attempt to methodically gather information on botanical medicines for use in a modern bureaucratic setting. For all of its benefits, it has some problems. It only reflects one aspect of "modern herbalism" – the scientific. Many of their findings are based on plausible theory and directly contradict, in some cases, how practitioners in North America are successfully using herbal products.

The absence of broad government involvement may change in coming years, but for the moment the challenging task of reviewing and integrating herbal information is left to the individual and to motivated organizations who are attempting to create non-governmental pharmacopoeias, like the American Herbal Pharmacopoeia (a very worth while set of documents). As might be imagined, there is a constant struggle to define terms, reconcile data from different eras and cultures, to decide what the key constituents of an herb are, and how the botanical as a whole works on various parts of the body. No single person or organization has all the answers, or perhaps even most of the right questions.

The Canadian Government has created monographs on many popular herbs, to aid in the application of Natural Product Numbers (NPN), as a way to identify which products have passed government 'inspection'. The goal here is to have all herbal products having a NPN thus helping the 'safety' of the public. Although these monographs can be useful for some things, at this writing (January 2011) there are many holes and mistakes in them. Hopefully government projects like this will be better in the future. It should be noted that there was no input from herbalists into the writing of these documents. When the Canadian Council of Herbal Practitioner Association (CCHA) approached the government on this, they stated that they had no outside funding and only wanted their own people to work on the monographs. This really meant that pharmacists, writers, and a few naturopaths worked on it - not herbalists.

The web site is:



<http://webprod.hc-sc.gc.ca/nhp/ndp-bdipsn/monosReq.do?lang=eng>

The web location has moved from time to time so your might have to search for it. It does list a large number of botanicals and could be useful for your own personal research, but remember it has not been vetted by herbalists.

I became a member of the NHP-PAC committee to over look this project in Sept 2010, elected for a three-year term. During this time period we will find many changes to the supplement landscape, as NPN comes into full force. This process has been very hard for the smaller companies, who might loose a large proportion of product base. The larger companies, who already have a suitable number of NPNs are ready to move forward with the full licensing process. In other countries that have gone through this process, many of the smaller companies have had to close, while larger companies succeeded. We are hoping this will not be the case in Canada, as the smaller companies are often the ones with the most innovative products.

It is important to note that Herbal Practitioners will still be able to 'compound' herbal mixtures. This in itself is a good reason to become at least a Master Herbalist, so you can still obtain the botanicals that you would like to use. It will be important to support the local society of Herbal Practitioners.

For the student like yourself, the first step is to acquire basic reference materials, become familiar with organizations that advocate herb use or sponsor herbal research, and most importantly, decide what your "working methods" are going to be when approaching new herbs and new products. Every professional has different levels of comfort with the new. Different elements of the medical profession have responded to products like melatonin, DHEA, Prozac or to new surgical techniques with enthusiasm, indifference, and extreme caution. The rationales are endlessly argued with every new item. It will be no different with new botanicals, new botanical products, and new botanical manufacturing methods.



The day is approaching when botanicals will be mixed with conventional pharmaceuticals (both OTC and prescription) ... as they already are in many areas outside of North America. Some herbalists and doctors will be appalled; others will dig in and begin experimenting immediately. The term "integrative medicine" coined by Dr. Andrew Weil and others is going to become a reality quicker than we think. Many organizations are using the term Complementary and Alternative Medicine or CAM. There is no clear definition of the nature of a CAM practice, but a 2005 report entitled *Complementary and Alternative Medicine in the United States* the Institute of Medicine (IOM) adopted this definition:

"Complementary and Alternative Medicine (CAM) is a broad domain of resources that encompasses health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the dominant health system of a particular society or culture in a given historical period. CAM includes such resources perceived by their users as associated with positive health outcomes. Boundaries within CAM and between the CAM domain and the domain of the dominant system are not always sharp or fixed."

Does this mean that herbal medicine will enter the hall of an orthodox CAM? Perhaps it would be better if botanical use doesn't reach the level of orthodoxy. For the next decade or two, at least in North America, botanical usage will be researched by commercial enterprises, independent clinicians, enterprising doctors and hospitals, industrious plant scientists, traditional herbalists, and ethnobotanists. It will be an eclectic group and their efforts will not lead to a simple clear "Big Book of Herbs" any time soon. Sorting out the "truth" will be difficult, if not impossible. In my opinion, we should get used to having our fondest biases about particular herbs upset on a regular basis. We're in for lots of excitement and surprises as North Americans re-embrace botanicals in their medicine.

You will need to invest your own common sense and investigative skills in making this course (and its botanical information) work for you. Herbs are a fascinating subject and one to which I've dedicated most of my adult life. If you approach herbal study with an open mind and a willingness to create your own synthesis of old and new,



I'm sure that this course will re-inspire your enthusiasm for health care and for a true service to the public.

For the next few pages we will take a look at some of the herbal traditions from around the world. Many of these mature medical systems might not make sense at first, but they are solid medical systems onto themselves.

MODERN HERBOLOGY

The most prominent form of herbal medicine practiced today in North America, as was mentioned in the Introduction, is "modern herbology". This blend of western science and folkloric traditions may seem a bit strange at first. Many of the senior clinical herbalists in North America come out of very eclectic traditions. From the great cultural mixing pot of North America, with a European scientific background and global communication networks, we have the birth of this type of medical tradition. To understand this eclecticism, let's look at the underlying traditions. For those of you who have access to my "Interactive Herbal CD-ROM" you will be able to see short video essays on these traditions. (unfortunately it only runs on old versions of Macs and Windows 2000 or earlier. If you access to one of those programs we sell it for \$10.) We will be discussing some of them later in this lesson, but let's first start with a subject that is closer to the central history of medicine, pharmacognosy.

PHARMACOGNOSY

At some time in the distant past the knowledge of medical practice and the knowledge of the preparation of medical substances became so large that it was hard for one individual to master both fields. This produced separate health care practitioners and the first apothecaries or pharmacies. This let each group study more deeply into their own specialty and expanded the horizons of their art. Let's take a brief look at this evolution to help us get a solid footing on how we should approach it.



*Read Textbook of
Advanced
Herbology,
p. 7 - 10.*

Pharmacognosy is a rigorous investigation of medicinal substances that come from the natural world. These substances are most often botanical, but can also be from the animal, fungal or even mineral kingdoms. One of the biggest differences of studying pharmacognosy instead of pharmacy is the significant complexity of botanical chemistry. A single plant has many thousands of interacting chemicals in its tissues.

The medicinal properties of a botanical reflect a "symphony" of the interactions of its chemistry. We can't say that there is one single constituent responsible for the overall medicinal action of the plant, just as we can't say that one note or even one instrument is responsible for Beethoven's Fifth Symphony. Yes, we can often determine which are some of the more important elements of the botanical constituents, but the future might prove us wrong.

I have been looking at the chemistry of medicinal plants for over thirty-five years and I think I have lost track of the times that the "major active ingredient" of some plants has changed. It is very useful to understand the chemistry of botanicals used in medicine, but botanicals works because of the interaction of the person and the botanical, not because of its chemistry. Understanding the biochemistry of a botanical is not like the single, almost pool-ball type theories we can find explaining single ingredient pharmaceuticals. There is mystery. There is empiric understanding. There are unknown mechanisms. Just as there are with many notable pharmaceuticals. This means to get a fuller understanding of modern herbology we have to put it in a broader context.



WHOLISTIC MEDICINE

Paramount among the ideas of (w)holistic medicine is the concept of the vital energies which flows through physical, emotional and mental experience. One of the concepts starting to have a strong influence on modern herbology is that of "energetics". The major stimulus for this focus is undoubtedly Oriental medicine, due in turn to the strength of the Oriental communities in North America, coupled with the large number of acupuncture colleges that also



teach herbal medicine. Let's take a brief look at some of the traditional medicine philosophies to get an idea how they perceive herbal medicine.

*Read Textbook of
Advanced
Herbology,
p. 12 - 33.*

ENERGETICS

In this reading assignment we had a chance to look at herbal medicine as practiced in the Orient, India and by Amerindians (Northern plains). There are many herbal practitioners in North America who have specialized in individual traditions of botanical use and have pushed these traditional concepts so they apply in very busy rural or urban practices. Many others have blended these concepts to create their own special style of herbal practice. In my clinic in Calgary, Canada, we have different practitioners who specialize in these various fields. Personally, I like to blend these concepts, often changing the mode, depending on the patients presenting symptoms, needs and preferences.

THE HISTORY OF HERBAL MEDICINE

We can find the tradition of herbology going back many thousands of years, at least 5,000 years in a written form. When Europeans first came to North America, they had a fairly sophisticated form of herbal use. This was further augmented by Amerindian deep knowledge of plant medicines. There were several expeditions sent out for the main purpose of learning more about the medicines of the First Nations peoples. Many of these ideas have been blended together so long ago it is not always easy to know what knowledge comes from which group. There was undoubtedly much cross-pollination of information.

In the latter part of the nineteenth century, herbology in North America had organized itself into a system that held vitalism at its core. It was felt the obstruction, or restriction of this vital force was what caused dis-ease. This is similar to Oriental medical systems of today.



There are many prominent characters in the history of North American Herbology and one of the most important is Samuel Thomson. He is responsible, (directly and indirectly) for the Friendly Botanic Society, a home cure system and for some of the founding philosophy behind the Eclectic School of Medicine in Cincinnati. To this day, one of the largest sources of information on herbology in the English language is in Cincinnati at the Lloyd Library. It has a very large selection of material (including 15th century Herbals, hand-painted and written in European monasteries, up to current scientific studies).

It is important to understand that at the turn of the century, many of the top medical minds of the day were directed toward herbology. Many of the medical doctors, were like Doc on the popular show from the '60's 'Gunsmoke'. They carried around their bags of herbal tinctures, liniments and often homeopathic remedies. A deep split occurred in the ranks of Natural Medicine when philosophical differences made various groups splinter off. The forming of the A.M.A and the Rockefeller Foundation's sponsorship of the publication of The Flexner Report made this split even deeper.

In the drive for professionalism and exclusivity, much of the tradition of healer was cast aside in favor of the prestige of the "doctor." Some now feel that because these same organizations profited from the outcome of the Report, it was like having a goat guard the garden.

We are now going through a new era in the field of herbology, one that can change North America from a third world power in Natural medicine to the more sophisticated role of contribution. Herbal medicine could aid in lowering the spiraling cost of health care in the 'developed' countries.

Vitalism - the opinion that a vital force neither chemical nor mechanical is responsible for the phenomenon of life. *from Taber's Cyclopedia Medical Dictionary*



CONCLUSION

Only 100 years ago, herbal medicine was still very prominent in North America. The herbal practice and research that was not interrupted in other parts of the world is now influencing botanical use in a very vital way in North America.

If we were going to look for a common perennial philosophy that sits behind most of these traditions, it would consist of two concepts: that of vital energy and that of the simply stated – IN-DO-OUT principle. You are what you take in, what you do with it and what you do not eliminate. This applies to emotions and mental concepts as much as it applies to the physical body.

SUMMARY

In this introduction we looked at the expansion of complementary (alternative) medicine and how it is an ever expanding field. We went on to discuss four (4) issues that might be kept in mind with the introduction of this material. And further addressed the whole issue of standardization and guaranteed potency and how it appears taking on a dominant role in Herbal medicine as we turn the clocks on the millennia.

Next we moved onto the evolution of modern pharmacognosy, various herbal traditions from around the world, and how the concepts of vital energy and energetics play a role in modern herbology. We saw how the chemistry of botanicals is very complex and that there is usually more than one constituent responsible for the herb's physiological and emotional impact. We also saw that even though herbal medicine in North America has had a rather quiet period for 50 years, it seems it is rapidly re-entering mainstream health care.

We conclude with a brief look at the concept of IN-DO-OUT and how it often influences a practitioner's choice of herbal remedies. In this lesson there is no quiz.



¹ http://nccam.nih.gov/news/camstats/2007/camsurvey_fs1.htm

² <http://www.massagemag.com/News/message-news.php?id=10000&catid=81&title=CAM%20Use%20in%20Canada>

