EAST MEETS WEST:
Blending the Best of Both Worlds into Modern Veterinary Practice
INTEGRATIVE VETERINARY MEDICINE

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Robert J. Silver DVM, MS
Boulder’s Natural Animal: An Integrative Wellness Center
Boulder, CO
rjsilver@qwest.net

TABLE OF CONTENTS:
INTRODUCTION

Veterinary Medicine is a dynamically growing and changing field. Modern advances in technology have contributed substantially to the improvement of both diagnosis and therapy in conventional veterinary medicine. These advances have taken place not just in academic veterinary medicine, but also in private practice. Specialists abound in every geographical location and 24/7 Animal ERs have reduced the need to be on call all the time. These advancements have contributed substantially to our ability as a profession to provide the highest standards and quality of medical care to our patients and our clients.

At the same time as conventional veterinary medicine has been advancing technologically, there has been a resurgence of interest both by the general public and by veterinarians in medical therapies that are more natural. Harsh side-effects from conventional medical therapies have driven many people to seek out more natural approaches to manage their own medical problems, especially persons with chronic diseases that have not been adequately addressed by conventional medicine. As a result, many people are finding benefits to the use of natural therapies which they did not receive from conventional medical approaches.

From their own personal successes, people are then also looking to help their family members and friends, including their four-legged family members, by providing them with natural approaches to their health care. Thus, many clients have been requesting from their vets that they provide some non-conventional medical therapies. The internet has become a resource for many in their pursuit of information about natural medicines for pets. Although accurate and reliable information is available on the internet, if one knows where to look, a lot of the information on the internet is tainted by market pressures. The information is actually an “Infomercial” designed to sell product. In the absence of strong veterinary advice and guidance, pet owners are turning to animal communicators and veterinary para-professionals first before consulting their veterinarians. It is this author’s thesis that the family veterinarian is the first animal health professional that a pet owner or guardian should consult for anything relating to their animal’s health.

The purpose of this seminar is to provide basic information and scientific perspectives that form the basis of the principles and practices that underlie Integrative Veterinary Medicine. Clinical protocols derived from this author’s 20 years practice of Integrative Veterinary Medicine are provided to help illustrate the practical application of these principles and practices. The goal for today’s seminar is to provide a practical knowledge base so that practitioners can better field those questions from those clients who are interested in Integrative Veterinary Medicine. Also for those practitioners interested in getting started gaining skills in Integrative Veterinary Medicine, this seminar should provide a sound introduction, and some clinical perspectives and cases.

Complementary and alternative veterinary medicine, (CAVM) refers to the use of alternative medical therapies a) instead of conventional medical therapies; or b) the use of alternative medical therapies as a complement to conventional therapies. In human medicine this type of medical practice is called: “Integrative Medicine”. This term implies that both types of therapies are “integrated” into a single medical practice. Another term used commonly for this type of medical practice is: “Holistic” or “Wholistic” medicine, which is a synonym for “Integrative” medicine.

The National Center for Complementary and Alternative Medicine, the branch of the NIH responsible for establishing an evidence-basis for alternative therapies defines Integrative Medicine as the:

“combining of mainstream therapies and Complementary and Alternative Medicine (CAM) therapies for which there is some high-quality scientific evidence of safety and effectiveness.”

Andrew Weil, MD a physician who has helped to popularize Integrative Medicine through his media efforts defines Integrative Medicine as:

2
"...not synonymous with CAM...it calls for restoration of the focus of medicine on health and healing and emphasizes the centrality of the patient-physician relationship."

Thus, Integrative Veterinary Medicine blends the best of conventional medicine with the patient-specific appropriate selection of alternative therapies that have an evidence-basis for their effectiveness and safety. These therapies are then used in a manner in which the veterinarian emphasizes the bond-centered relationship between their client and their pet.

Typical integrative therapies that a veterinarian might employ include: Wholesome diets, Botanical and Nutraceutical therapeutics, Acupuncture, Manual Therapies (Massage and manipulative therapies), and Flower Essences and Homeopathy. Other more esoteric integrative therapies include: Ozone therapy, Homotoxicology, Qi Gong, Reiki, Crystal healing, Sound and light therapies.

One common misconception of people not familiar with holistic or integrative medicine is the use of the term “homeopathic”. Not uncommonly, a practitioner of integrative or holistic medicine will be referred to as a “homeopathic” vet. If the veterinarian practices homeopathy, which is a subset of holistic medicine, then that terminology is correct. Many veterinarians, this author included, do not use homeopathic medicine in their holistic practice, thus it is erroneous to refer to them as such. The appropriate terminology would be a “holistic” vet or an “integrative” vet.

In this author’s small animal veterinary practice, patients are initially assessed based on physical exam, history and diagnostic tests. Many patients arrive from specialists with very detailed diagnoses already in hand. During the initial intake exam and consultation, a diagnostic and treatment plan is developed that takes into account: a) The clients’ goals with respect to the clinical outcomes that are desired and b) How interested they are in the use of integrative therapies. Clients are educated to the fact that not all clinical outcomes are achievable with natural therapies alone, and that in some cases natural therapies may be contraindicated in the initial stages of diagnostic and therapeutic workups when the medical condition of the patient may be terminal or life-threatening.

Triage has as much of a place in an integrative practice, as it does in the ER. Most clients, when the facts and details are explained to them, are more than willing to allow our veterinary hospital to use whatever it takes to get their pets well. Many times we will explain to the client that we will start with conventional therapies to get the situation under control, and then use natural therapies and integrative approaches to maintain and manage the condition as well as to help mitigate potential side-effects from the stronger conventional therapies.

Many clients who are interested in integrative medicine are also interested in wholesome homemade or commercial diets. These diets are primarily raw or cooked meat, cooked carbohydrate sources, cooked and raw fruit and vegetables. Anecdotal stories abound on the internet in discussion groups about dogs or cats who had chronic diseases that were miraculously “cured” when their owners put them on these diets.

In this author’s integrative veterinary medical practice clients are given the recommendation that wholesome, well prepared and balanced homemade diets are the best food they can provide both themselves and their four-legged family members. Clients who are interested in homemade diets are counseled in their safe and nutritious preparation. Home made diets are not for everyone, so for those clients who want to provide their pets with improved nutrition but who aren’t ready willing or able to provide home-prepared meals, recommendations are made for reputable commercial raw meat diets, or “natural” kibble, canned and/or freeze-dried diets. Observations made by this author over the past 20 years of recommending these diets, have shown substantial benefits to many of these patients. In a few patients, these homemade diets (either raw or cooked) have not been a good “fit”. No matter how much we try to get these patients to make the conversion to more wholesome foods, their systems just never adapt. These patients will develop (or may have already had): Soft stools, diarrhea, vomiting, eructation, flatulence, borborygmus or exacerbation of some other systemic weakness.

In addition to dietary improvements for these patients, this author’s medical practice also offers acupuncture, botanical and nutraceutical therapies, as well as the use of homeopathic remedies for acute medical conditions. Many patients seen in this practice have been referred from Colorado State University’s Veterinary Teaching Hospital or from private specialists in the Denver metro region. They come with diagnoses and therapeutic programs recommended by these specialists. Generally, the referring doctor’s prescriptions are not countermanded, but are used as a foundation upon which nutritional, botanical, nutraceutical and Traditional Chinese medical therapies are integrated. It is important to note that the concurrent use of conventional and integrative therapies frequently works better than either system of therapies alone.

There are many ways of using Integrative medical practices in veterinary medicine. For some practices, Integrative Medicine simply means the use of integrative therapies alongside conventional therapies. One example of this would be the dog who has arthritis who doesn’t tolerate NSAIDs. Liver and kidney enzymes aren’t elevated from the use of the NSAIDs, but the dog vomits with each NSAID it is given.
In this case, the use of acupuncture could substantially improve this arthritic patient’s mobility. When nutraceuticals and botanicals are added to this patient’s program, as well as life style and weight management, improvements in mobility can become substantial.

Another application of alternative therapies for this patient would be to strengthen and stabilize its digestive system using sucralfate, pepcid and/or ginger root, glutamine, licorice root, and white rice.

For some practitioners of Integrative Medicine, the use of specific alternative therapeutic modalities are not as important as the principles and philosophies that underlie integrative medicine. The integrative, holistic perspective has the practitioner looking at the patient in the context of its genetics, environment, diet, lifestyle, and emotional and behavioral considerations.

It may seem that this is the way that you are already approaching your patients. Integrative medicine is nothing new, it is really, just “good” medical practice. In fact, many conventional practitioners use this approach to some extent. Taking this “Wholistic” approach is especially useful for patients with chronic, multiple, degenerative disease conditions.

Modern veterinary medicine is following human medicine in becoming increasingly more specialised, compartmentalized and subjected to rigid corporate guidelines (managed care) that may serve the bottom line better than the patient. Patients are being reduced to case numbers or diagnoses. Doctor-Client “face time” is being reduced to accommodate the need to “post more transactions daily” in order to increase gross receipts to cope with increased economic pressures.

As will be described in the following pages, many of these Integrative therapies use different ways to “frame” the patient other than by the conventional approaches that we as veterinarians have been trained. Being able to look at a case differently can help the practitioner to “break through” the stalemate that often occurs during therapy of difficult, complex disease patterns. Many times this different approach can effect positive change in a patients’ clinical picture when conventional therapies were unable to help much.

Integrative medicine is not an “all or nothing” form of medicine. As you learn more about integrative medicine you will see that there are many ways that it can fit into your own practice style without forcing you to completely “retool” your practice or spend inordinate amounts of time learning esoteric therapies that may have little general value to your clinical practice.

This author invites you to approach the information in this seminar with an open mind and the perspective that this “inclusive” medical approach can revitalize your own spirit when it comes to medical practice as well as rejuvenate your relationship with your clients and your patients.

DEFINITIONS

Alternative Medicine
Alternative medicine describes practices used in place of conventional medical treatments. It refers to those practices explicitly used for the purpose of medical intervention, health promotion or disease prevention which are not currently taught at U.S. medical schools. Alternative medicine includes practices that incorporate spiritual, metaphysical, or religious underpinnings; non-European medical traditions, or newly developed approaches to healing. There are almost 500 such systems.

Applied Kinesiology
Applied kinesiology (AK) is related to diagnostic kinesiology. It is a method that purportedly gives feedback on the functional status of the body. Proponents say that when properly applied, the outcome of an AK test, such as a muscle strength test, will provide for a low risk diagnostic method to help determine the efficacy of therapy for patients.

Applied Kinesiology is classified with alternative medicine, and is therefore distinct from academic kinesiology, which is the scientific study of human movement and its application.

Ayurvedic Medicine
Ayurveda is an ancient East Indian system of healing that seeks to promote health through a “balanced” lifestyle and various natural healing methods. Ayurvedic practitioners tailor treatments to each patient’s unique condition.

Bach Flower Essence therapy
Bach flower remedies are dilutions of flower "essences" developed by Dr. Edward Bach. They are similar to homeopathy in many respects and form a part of alternative medicine. Some researchers believe that they exert their claimed effects via the placebo effect, however practitioners feel the "energetic signature" of the flower can be transmitted to the user and affect a person's psychological
state.

One difference between homeopathy and Bach flower remedies are the "potentization" methods used to produce the remedies. Flower remedies are produced using the sun method or, for the hardier plants, the boiling method. Both these methods were invented by Bach. Another key difference is that Bach remedies are only used to treat the mental symptoms believed by practitioners to be the root cause of the many diseases. Bach flower remedies are not dependent on the theory of successive dilutions, and are not based on the Law of Similars. The Bach Remedies are all derived from non-toxic substances, with the idea that a "positive energy" can redirect or neutralize "negative energy".

There are thirty-eight original Bach remedies plus "Rescue Remedy TM" (see below), each prescribed for certain mental and emotional problems. They form a complete system with which practitioners treat every variety of human emotional imbalance. Other systems of remedies have been developed by practitioners who have access to flowers that are indigenous to other regions, and that were therefore unknown to Bach.

**Botanical Medicine or Herbal Medicine**

“Veterinary botanical medicine is the use of plants and plant derivatives as therapeutic agents. Since some of these botanicals may be toxic when used at inappropriate doses, it is imperative that veterinary botanical medicine be practiced only by licensed veterinarians who have been educated in veterinary botanical medicine. Communication on the use of these compounds within the context of a valid veterinarian/client/patient relationship is important.” (AVMA Guidelines 1996)

**Chiropractic Medicine:**

A system of healing based on the premise that poor spinal health (“dynamic” subluxations) leads to improper nerve flow and disease. Through specific adjustments of the spine and extremities one can restore spinal health and normal bodily function.

“Veterinary chiropractic is the examination, diagnosis, and treatment of non-human animals through manipulation and adjustments of specific joints and cranial sutures. The term "veterinary chiropractic” should not be interpreted to include dispensing medication, performing surgery, injecting medications, recommending supplements, or replacing traditional veterinary care. While sufficient research exists documenting efficacy of chiropractic in humans, research in veterinary chiropractic is limited. Sufficient clinical and anecdotal evidence exists to indicate that veterinary chiropractic can be beneficial. It is recommended that further research be conducted in veterinary chiropractic to evaluate efficacy, indications, and limitations. The assurance of education in veterinary chiropractic is central to the ability of the veterinary profession to provide this service. Veterinary chiropractic should be performed by licensed veterinarians; however, at this time, some areas of the country do not have an adequate supply of veterinarians educated in veterinary chiropractic. Therefore, it is recommended that, where the state's practice acts permit, licensed chiropractors educated in veterinary chiropractic be allowed to practice this modality under the supervision of, or referral by, a licensed veterinarian who is providing concurrent care.” (AVMA Guidelines 1996)

**Complementary medicine or Complementary and Alternative Veterinary Medicine (CAVM)**

Complementary medicine describes alternative medicine used in conjunction with conventional medicine. The term complementary and alternative medicine (CAM) is an umbrella term for both branches.

The National Center for Complementary and Alternative Medicine defines complementary and alternative medicine as "a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine".

**Conventional Medicine:**

The medical theory and practice that is taught in established educational institutions according to current scientific, historical and cultural standards.

**Crystal Healing**

The theory that underlies this modality is that every living organism has a "vibrational energy system," which includes chakras, subtle bodies and meridians. By using the appropriate crystals one can allegedly "tune" an energy system or rebalance energies, thus improving well-being.

The earliest records of crystal healing come from ancient Egypt. The Ebers papyrus states the medicinal uses of many different gems. Healing with crystals is also recorded in India's Ayurvedic records and in traditional Chinese medicine from around five thousand years ago.
Eclectic medicine

Eclectic medicine refers to a branch of alternative medicine which makes use of herbal remedies.

The term was coined by Constantine Rafinesque (1784-1841), a doctor living among the Native Americans, and observing their use of medicinal plants.

He coined the word "eclectic" to refer to those physicians who adopted in practice whatever was found to be beneficial to their patients. The Eclectic Medical Institute was formed in the 1830s as an alternative to the conventional medicine of the time. By the 1850s, several American doctors, especially from the New York Academy of Medicine, had begun using herbal salves.

Eclectic medicine is still practiced today, but mainly by medical herbalists rather than physicians.

Functional Medicine

Functional medicine is anchored by an examination of the core clinical imbalances that underlie various disease conditions. Those imbalances arise as environmental inputs such as diet, nutrients (including air and water), exercise, and trauma are processed by one’s body, mind, and spirit through a unique set of genetic predispositions, attitudes, and beliefs.

The fundamental physiological processes include communication, both outside and inside the cell; bioenergetics, or the transformation of food into energy; replication, repair, and maintenance of structural integrity, from the cellular to the whole body level; elimination of waste; protection and defense; and transport and circulation. The core clinical imbalances that arise from malfunctions within this complex system include:

- Hormonal and neurotransmitter imbalances
- Oxidation-reduction imbalances and mitochrondropathy
- Detoxification and biortransformational imbalances
- Immune imbalances
- Inflammatory imbalances
- Digestive, absorptive, and microbiological imbalances
- Structural imbalances from cellular membrane function to the musculoskeletal system

Holistic medicine

“Holistic veterinary medicine is a comprehensive approach to healthcare employing alternative and conventional diagnostic and therapeutic modalities. In practice, holistic veterinary medicine incorporates, but is not limited to the principles of acupuncture and acuotherapy, botanical medicine, chiropractic, homeopathy, massage therapy, nutraceuticals, and physical therapy as well as conventional medicine, surgery and dentistry. It is recommended that holistic veterinary medicine be practiced only by licensed veterinarians educated in the modalities employed. The modalities comprising holistic veterinary medicine should be practiced according to the licensure and referral requirements concerning each modality.” (AVMA Guidelines1996)

Homeopathic Medicine

Homeopathy is a system of natural healing based on the premise that “like cures like”. Homeopathic remedies are highly diluted medicines that stimulate the healing response of the body.

Homotoxicology

The use of specialized homeopathic solutions that are administered by injection into specific acupuncture points to initiate a process of detoxification of the body in order to address chronic disease complaints. Homotoxicology theory posits that there are 6 levels of disease starting superficially in the body and culminating in deep-seated deposition of toxins at the intracellular level that contribute to disease such as cancer and autoimmune disease.

Integrative Medicine

The National Center for Complementary and Alternative Medicine defines integrative medicine as "[combining] mainstream medical therapies and CAM therapies for which there is some high-quality scientific evidence of safety and effectiveness". Ralph Snyderman and Andrew Weil state "integrative medicine is not synonymous with complementary and alternative medicine (CAM). It has a far larger meaning and mission in that it calls for restoration of the focus of medicine on health and healing and emphasizes the centrality of the patient-physician relationship".

Proponents of evidence-based medicine regard the distinction between conventional and alternative medicine as moot, preferring "good medicine" (with provable efficacy) and "bad medicine" (without it). "Bad medicine" is any treatment where the efficacy and safety of which has not been verified through peer-reviewed, double blind placebo controlled studies, regarded as the "gold standard" for
determining the efficacy of a compound. It is thus possible for a method to change categories in either direction, based on increased knowledge of its effectiveness or lack thereof.

**NAET**
NAET (Nambudripad Allergy Elimination Technique) is an alternative medicine treatment for allergies using a combination of chiropractic, applied kinesiology and acupressure. It was founded in 1976 by Devi S. Nambudripad while treating her own allergy symptoms. Devi S. Nambudripad is a licensed chiropractor and acupuncturist practicing in California, US.

**Nutritional Medicine**
The use of whole food materials or isolated or concentrated components of food or food materials that have a beneficial influence on the health of an individual or which can positively influence the healing process.

**Nutraceutical medicine**
"Veterinary nutraceutical medicine is the use of micronutrients, macronutrients, and other nutritional supplements as therapeutic agents. Communication on the potential risks and benefits from the use of these compounds within the context of a valid veterinarian/client/patient relationship is important. Continued research and education on the use of nutraceuticals in veterinary medicine is advised.” (AVMA Guidelines 1996)

**Orthomolecular therapy**
The term "orthomolecular" was first used by Linus Pauling in 1968, to express the "idea of the right molecules in the right amounts within the context of physiology" and subsequently defined "orthomolecular medicine" as "the treatment of disease by the provision of the optimum molecular environment, especially the optimum concentrations of substances normally present in the human body." or as "the preservation of good health and the treatment of disease by varying the concentrations in the human body of substances that are normally present in the body and are required for health."

Since 1968 the orthomolecular field has developed further through the works of researchers. Despite this it is still often closely associated by the public with Pauling’s advocacy of multi-gram doses of vitamin C for optimal health.

Orthomolecular medicine posits that many typical diets are insufficient for long term health; thus, orthomolecular medical diagnoses and treatment often focus on use of natural substances found in a normal diet such as vitamins, dietary minerals, enzymes, antioxidants, amino acids, essential fatty acids, dietary fiber and intestinal short chain fatty acids.

Orthomolecular medicine argues that some diseases reflect biochemical anomalies and that it is advantageous to recognize and to correct these anomalies at an early stage, before they result in recognizable diseases.

The orthomolecular practitioner relies heavily on laboratory testing. In addition to standard clinical chemistries, orthomolecular practitioners now employ a wide range of laboratory analysis, including those for amino acids, organic acids, vitamins and minerals, functional vitamin status, hormones, immunology, microbiology, and gastrointestinal function. Many of these tests have not been accepted by mainstream medicine.

Orthomolecular therapy consists in attempting to provide optimal amounts of substances normal to the body, most commonly by oral administration. In the early days of orthomolecular medicine, this usually meant high-dose, single-agent nutrient therapy. Thus, "optimal" is a matter of the "clinical judgment" of the orthomolecular practitioner. Most often, the orthomolecular practitioner uses many substances: amino acids, enzymes, non-essential nutrients, hormones, vitamins, minerals etc. in a therapeutic effort to restore those (or derivative substances) to optimum levels for healthy young persons.

Often supplementation with relatively large doses of vitamins is given and the name megavitamin therapy has become popularly associated with the field. Megavitamin therapy is the administration of large amounts of vitamins, often many times greater than the recommended dietary allowance (RDA). Short chained fatty acids are produced by fermentation of dietary fiber in the colon, then absorbed and utilized, often aided with a combination of probiotics, prebiotics and "glyconutrients" added to the diet.

The substances may be administered by changing the diet to emphasize certain elements high in nutrients, dietary supplementation with tablets, or intravenous injection of nutrient solutions.

**Ozone therapy**
Ozone therapy is a the medical use of ozone in the treatment of infectious diseases and cancer. Ozone can be introduced to the body in many ways, including through water absorption, injection, transdermal application and insufflation. The gas is used at very carefully controlled levels. The super-oxygenated oxygen that is ozone gives up its singlet oxygen very easily. This free radical is microbial and preferentially more toxic to cancer cells than to healthy tissue. \[O_3 = O_2 + O\].

Medical ozone therapy is recognized in Bulgaria, Cuba, Czech Republic, France, Germany, Israel, Italy, Mexico, Romania and Russia. It is currently used legally in 16 Nations. At least 12 states in the USA (AK, AZ, CO, GA, MN, NY, NC, OH, OK, OR, SC and WA) have passed legislation to ensure that alternative therapies are available to consumers. Physicians in those states can legally use ozone as an alternative treatment in their practice.

**Paradigm Shift**

This term was first used by Thomas Kuhn in his 1962 book The Structure of Scientific Revolutions to describe a change in basic assumptions within the ruling theory of science. It has since become widely applied to many other realms of human experience as well. A scientific revolution occurs, according to Kuhn, when scientists encounter anomalies which cannot be explained by the universally accepted paradigm within which scientific progress has thereto been made. The paradigm, in Kuhn's view, is not simply the current theory, but the entire worldview in which it exists, and all of the implications which come with it. There are anomalies for all paradigms, Kuhn maintained, that are brushed away as acceptable levels of error, or simply ignored.

**Phototherapy**

Light therapy or phototherapy consists of exposure to specific wavelengths of light using lasers, LEDs, fluorescent lamps, dichroic lamps or very bright, full-spectrum light, for a prescribed amount of time. It has proven effective in treating Acne vulgaris, seasonal affective disorder (SAD), and for some people it has ameliorated delayed sleep phase syndrome. Phototherapy has recently been shown effective in non-seasonal depression. Proponents claim demonstrable benefits for skin conditions such as psoriasis. Phototherapy has also been shown to be effective for pain management, and can be used to stimulate acupuncture points.

**Reiki**

Reiki, (English pronunciation: Ray-kee) is a form of spiritual healing and spiritual practice. proposed for the treatment of physical, emotional, mental and spiritual diseases. Mikao Usui developed Reiki in early 20th century Japan, where he claimed to receive the ability of 'healing without energy depletion' after three weeks of fasting and meditating on Mount Kurama. Practitioners use a technique similar to the laying on of hands, in which they claim to be channels for energy ("Ki") guided by a universal spirit or spiritual nature ("Rei") — flowing through their palms to heal a person wherever they may need healing. A study in Alternative Therapies (Jan/Feb 2005 issue) said that in 2002 there were over one million U.S. adults who had experienced Reiki treatments. Reiki is controversial because there is no scientific evidence it works by any means other than suggestion or the placebo effect.

**Shamanism**

Shamanism refers to a range of traditional beliefs and practices similar to Animism that claim the ability to diagnose and cure human suffering. Some anthropologists and religion scholars define a shaman as an intermediary between the natural and spiritual world, who travels between worlds in a trance state. Once in the spirit world, the shaman would commune with the spirits for assistance in healing, hunting or weather management. Shamanistic practices are sometimes claimed to predate all organized religions, and certainly date back to the Neolithic period. Aspects of shamanism are encountered in later, organized religions, generally in their mystic and symbolic practices. Greek paganism was influenced by shamanism, Some of the shamanic practices of the Greek religion later merged into the Roman religion.

The shamanic practices of many cultures were marginalized with the spread of monotheism in Europe and the Middle East. In Europe, starting around 400, the Catholic Church was instrumental in the collapse of the Greek and Roman religions. Temples were systematically destroyed and key ceremonies were outlawed or appropriated. The Early Modern witch trials may have further eliminated lingering remnants of European shamanism.

The repression of shamanism continued as Catholic influence spread with Spanish colonization. The shaman plays the role of healer in shamanic societies; shamans gain knowledge and power by traversing the axis mundi (the “world tree” which is the connection between heaven and earth) and bringing back knowledge from the heavens. Even in western society, this ancient practice of healing is referenced by the use of the caduceus as the symbol of medicine, also known as the Rod of Asclepius.
The staff of the caduceus is the axis mundi itself, and the serpent (or serpents) are the guardians or guides to the other realm. Oftentimes the shaman has, or acquires, one or more familiar helping entities in the spirit world; these are often spirits in animal form, spirits of healing plants, or (sometimes) those of departed shamans.

**Traditional medicine**
That medical practice which is based in historical, empirical, cultural and folk practices.

**Traditional Chinese Medicine (TCM)**
Traditional Chinese medicine (also known as TCM or T.C.M.) is a range of traditional medical practices used in China that developed during several thousand years. These practices include herbal medicine, acupuncture, and massage. TCM is a form of Oriental medicine, which includes other traditional East Asian medical systems such as Japanese and Korean medicine. TCM says processes of the human body are interrelated and constantly interact with the environment. Therefore the theory looks for the signs of disharmony in the external and internal environment of a person in order to understand, treat and prevent illness and disease. TCM theory is based on a number of philosophical frameworks including the Theory of Yin-yang, the Five Elements, the human body Meridian system, Zang Fu theory, and others. Diagnosis and treatment are conducted with reference to these concepts. TCM does not usually operate within a scientific paradigm but some practitioners make efforts to bring practices into an evidence-based medicine framework.

**Unani medicine**
Though the threads which comprise Unani healing can be traced all the way back to the Greek physician Galen, who is credited as the father of modern Western medicine, who lived in the second century AD. The basic knowledge of Unani medicine as a healing system was collected by Hakim Ibn Sina (known as Avicenna). The time of origin is dated at circa 980 AD in Persia. It is a comprehensive system encompassing virtually all of the known healing systems of the world. As an alternative medicine, Unani has found favor in Asia especially India. In India, Unani practitioners can practice as qualified doctors, as the Indian government approves their practice. Unani medicine is very close to Ayurveda. Both are based on theory of the presence of the elements (in Unani, they are considered to be fire, water, earth and air) in the human body. (The elements, attributed to the philosopher Empedocles, determined the way of thinking in medieval Europe.) According to followers of Unani medicine, these elements are present in different fluids and their balance leads to health and their imbalance leads to illness. Most medicines and remedies (often common herbs and foods) used in Unani are also used in Ayurveda. While Unani was influenced by Islam, Ayurveda is associated with Vedic culture.

The basic nutritional tool used in Unani medicine is honey. Honey is considered by some to have healing properties and hence is used in food and medicines practiced in the Islamic world. Real pearls and metal are also used in the making of Unani medicine based on the kind of ailment it is aimed to heal.

**ETHNOMEDICINE: THE ROOTS OF INTEGRATIVE MEDICINE**
In recent years, there has been an increase of interest on the part of the pharmaceutical industry in discovering medicines derived from other cultures. These derivatives of traditional folk medicines often times have yielded potent and effective pharmaceuticals that become a part of our conventional pharmaceutical armamentarium. These unique medical remedies may address disease conditions that do not respond well enough with conventional medicines. Lay people as well as professions share this interest in non-conventional traditional systems of healing. This upsurge of interest in medicines from other cultures, known as “Ethnomedicine” has been a strong stimulus to increase in the number of practitioners that are now offering specific ethnomedical therapies, such as acupuncture and Chinese Herbal therapies with TCM (Traditional Chinese medicine), or massage diet and herbal therapies as are found used with Ayurvedic traditional medicine. The following sections will briefly cover the most widely used of these ethnomedical systems.

**TRADITIONAL CHINESE VETERINARY MEDICINE**

**ACUPUNCTURE: A VERY POWERFUL TOOL**

Acupuncture is the insertion of thin needles into specific anatomic locations, known as “acupuncture points” that stimulate a response that involves as complex cascade of physiological responses, including the release of numerous neurochemicals and hormones in the CSF, tissues and bloodstream, as well as increasing regional blood flow. Acupuncture is used to treat specific “patterns of dysfunction” by bringing the body systems back into balance or homeostasis.
Acupuncture was developed in China thousands of years ago, based on their philosophy of the Universe regarding concepts of Yin and Yang. This reflects the Taoist point of view, and as an Ethnomedical system, acupuncture diagnosis and treatment is based upon this idea that everything in the world possesses a unique combination of Yin and Yang.

Yin and Yang are the two complementary energies that are expressed in this table:

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This Ethnomedical system is called Traditional Chinese Medicine (TCM). TCM encompasses more than just acupuncture. It also includes herbal medicine, which is organized in a parallel fashion to acupuncture, massage and manipulative therapies (called Tuina), dietary therapy, and lifestyle modification. TCM is truly a holistic medical discipline when practiced according to Taoist philosophy.

Veterinary medicine in ancient China incorporated the use of acupuncture and herbal therapies and was used as a means of maintaining a robust food supply, as well as medical maintenance of the “beasts of burden” that were used to till the fields, and for transportation and running wells. TCVM or Traditional Chinese Veterinary Medicine is still practiced in China, and is taught to veterinarians in China. In the last 20 years, TCVM has found roots in Europe, Australia and North America, and is currently taught through the following organizations: The International Veterinary Acupuncture Society (IVAS) and the Chi Institute in the United States.

“Medical Acupuncture” is a form of acupuncture that does not use the Asian philosophy in its diagnostic and therapeutic strategies. Instead it looks at the neuropathologic basis of acupuncture, and uses point selection based on the biomedically-defined actions of the acupuncture points. Currently this approach to acupuncture is being taught to medical doctors (MDs, Dos and DCs) and to veterinarians. The Veterinary Medical Acupuncture courses are part of the curriculum of several Veterinary Teaching Hospitals in the United States.

For this paper, the neurophysiologic basis of medical acupuncture will be discussed. Resources and references at the end of this paper will point the reader in the direction of the TCVM courses and reference texts.

**ACUPUNCTURE POINTS:**

Acupuncture points are located anatomically near plexi of nerves, arteries and veins. The stimulation of these points produces the complex beneficial response associated with acupuncture therapy. When electrical conductance of the skin is measured at acupuncture points versus non-acupuncture points, it is found that these locale has a lower electrical conductance. This allows the use of electrical meters to accurately locate acupuncture points. These points that can be located by instrumentation correspond exactly to the anatomical locations determined 4000 years ago by the Chinese. On a microscopic basis, these points can be identified by their very specific structure. There have been four types of acupuncture points defined.

- Type I points are called “motor points"  
- Type II points are located over superficial nerves where they meet on the dorsal and ventral midlines.  
- Type III points are located at high density foci of superficial nerve plexi.  
- Type IV points are located at muscle-tendon junctions.

**ACUPUNCTURE MERIDIANS: PATHWAYS of TRANSMISSION of SIGNALS**
When acupuncture points have been stimulated they send their stimuli along acupuncture pathways or “meridians” or “channels” or “vessels”. The acupuncture meridians carry stimuli and information from the acupuncture point to the brain and target organs. These signals travel along afferent peripheral nerves, from the acupuncture point to the spinal cord. Once the signal reaches the spinal cord, afferent neurons synapse on inhibitory, excitatory and projection neurons. The projection neurons travel cranially through the spinal cord to the brain via the lateral spinothalamic tract. After synapsing in the caudal thalamus, the projection neurons are distributed to the cortex. Projection neurons, exception in primates, have a diffuse and multisynaptic pathway. This pathway is interrupted by axons that leave their pathway and then rejoin the pathway contralaterally or ipsilaterally. This is one reason why animal patients with spinal cord lesions can respond to acupuncture as compared to primate and human patients.

MECHANISMS of ACTION

There have been 6 mechanisms of action defined based on neurochemicals relationships. These are:

1. **Gate Theory**: Stimulation of acupuncture points affects alpha, beta or delta fibers, which have synapses on inhibitory interneurons before pain impulses from C fibers arrive. This can prevent pain impulses from being perceived at higher centers. This segmental analgesia can be promoted by acupuncture point stimulation and is consistent with the gate theory of pain control. In research studies with animals with conjoined blood supplies, the second animal will receive the analgesia to the same degree as the animal receiving acupuncture.

2. **Humoral Factors**: Another mode of action of acupuncture stimulation creates the release of a number of humoral factors from the brain and other organs, which can impact other organs and a number of physiological mechanisms. These humoral factors are specific to the points that are stimulated. Humoral factors that have been measured in research include: beta-endorphin, serotonin, cortisol, prolactin, oxytocin, luteinizing hormone, and interferon. Studies have found that acupuncture can affect ovarian, testicular, thyroid, parathyroid, parathyroid and pancreatic function. This theory of action can explain the effect found in the previous theory of acupuncture action with conjoined blood supplies.

3. **Neural Opiates**: Following acupuncture stimulation certain neuropeptides are released into the CNS. These neural opiates: Enkephalins, beta-endorphins, and the opiate peptide NAGA. Pain perception is altered by the release of these substances. When electroacupuncture (stimulation of acupuncture points with low level electrical signals) is performed it has been found that dependent upon the frequency of the stimulus implied. Patients receiving acupuncture often become relaxed or sleepy. Interestingly enough, when naloxone is administered to the patient their acupuncture analgesia is reversed. This same principle is what makes TENS units effective for human sufferers of chronic pain.

4. **Autonomic**: Somato-visceral reflexes in the spinal cord are stimulated by acupuncture treatments. Studies have shown that these somatovisceral afferents from specific points and their target organ systems anatomically overlap in the dorsal horn grey matter. This is one reason why a point in near the knee (Stomach 36) can affect stomach function, as well as a point in the forearm which can have a similar effect (Pericardium 6).

5. **Regional Effects**: Needle stimulation of acupuncture points can be associated with a local defense reaction involving a response that involves immune, visceral and somatic tissues. Needling produces an antinociceptive flexion, a contralateral extension and muscle contraction around the needle. It may feel like the needle is being grabbed by the muscle tissue, and this may create a feeling of the needle being “grabbed” by the surrounding muscle that it penetrates. As part of these regional effects we also see a coagulation cascade, and initiation of both the kinin and complement systems. Vasodilation occurs as part of the local response to needling; mast cells degranulate and bradykinins produce a local increase in vascular permeability. Humans who experience acupuncture report feelings of heaviness, warmth and distention.

6. **Electrical Theory**: Studies of bone fracture repair demonstrate that bio-electric fields promote improved healing by virtue of their electromagnetic energy. One theory proposes that needling of an acupuncture point stimulates the flow of sodium ions to a painful area, thus reducing cell lysis and reducing pain. When dilute sodium hydroxide or saline is injected into acupuncture points, it has been found that it provides better pain control than traditional “dry” needling. The successful use of magnets applied to acupuncture points, or of magnetic devices that are worn over acupuncture points or to painful sections of the body support this theory.

**CLINICAL APPLICATIONS OF VETERINARY ACUPUNCTURE:**

a. **Orthopedic Pain Management**: Hip dysplasia, spondyložič. DJD. and disc disease.
b. **Oncology:** Chemotherapy side-effects relief, improved immune function, sense of well-being, improved time in remission

c. **Immune-Mediated diseases:** Improve and balance cellular and humoral mediated immunity

d. **Dermatology:** Acupuncture releases endogenous corticosteroids, suppresses mast cell degranulation, and increases circulating IgE. Patient dependence upon corticosteroids, antihistamines, and antibiotics can be modulated with acupuncture treatments.

e. **Neurology:** Both phenobarbital and potassium bromide may produce adverse side-effects and/or still allow for breakthrough seizures. Acupuncture can help to overcome these problems with anti-convulsant chemotherapy. Acupuncture can help patients suffering from CVA or vestibular syndrome. Patients who are geriatric and senile can also benefit from acupuncture therapy.

f. **Hepatic Disease:** Hepatitis, hepatic lipidosis, hepatic side-effects from pharmacological therapeutics can benefit from acupuncture therapy. Acupuncture can improve appetite, reduce nausea and improve overall patient sense of well-being. There are some published papers demonstrating improvement in hepatic enzyme elevations.

g. **Cardiovascular Disease:** With acupuncture, cardiac patients are more rapidly stabilized on cardiac medications and nutraceuticals and botanicals. HCM Boxers and DCM Dobe will stabilize for longer periods of time than are normally found with conventional medication and therapies.

h. **Respiratory Disease:** Feline asthma, allergic bronchitis, respiratory diseases secondary to cardiac disease can benefit from acupuncture therapy.

i. **Dystocia:** Acupuncture can help with difficult births.

j. **Others:** Behavior disorders, lick granulomas, surgical analgesia, reproductive disorders, and wound healing.

### A CLINICALLY PROVEN ACUPUNCTURE POINT

1. **GV26:** The resuscitation point, located at the philtrum of the nares. Can be stimulated with a fingernail or a 25 gauge needle.

2. Has been demonstrated to resuscitate cardiac and respiratory arrest. Can truncate seizure events if stimulated in prodromal phase.

### HOW DOES THIS POINT WORK?

From Narda Robinson DVM, DO: VeterinaryPracticeNews.com 2005

**Anatomy of GV 26**
The indications of acupuncture points often become apparent after analyzing their key anatomical features. Tissues associated with GV 26 receive sympathetic fibers from the cervical sympathetic ganglia. Trigeminal nerve branches provide sensation to the skin and underlying structures.
A recent study in the Journal of Comparative Neurology showed that sensory-sympathetic and sensory-parasympathetic fiber combinations occur in blood vessels of the face. Intimate interconnections between sensory and autonomic fibers serve to regulate microcirculation. These communications may also mediate autonomic responses to afferent stimulation provided by acupuncture.

**Physiology of GV-26**

Acupuncture at GV 26 activates the sympathetic nervous system. This elevates catecholamine levels, increases cardiac output and stroke volume. Furthermore, stimulation of extracranial trigeminal nerve fibers can increase cortical cerebral blood flow.

Electrical stimulation at 2 hertz delivered to sympathetic fibers of the nose can cause vigorous sympathetic activation, exhibited as strong vasoconstriction of nasal mucosal blood vessels. Two cycles of stimulation per second (i.e., 2 hertz) approximates the frequency of pecking GV 26 during resuscitation maneuvers. Combined, these neurophysiologic responses help explain GV 26’s role in reversing cardiorespiratory collapse and loss of consciousness. Sometimes, stimulation of the same acupuncture point under different clinical conditions can produce opposite responses. The reason for this is that acupuncture works by neumodulation, which may raise or flatten physiologic reactions based on the direction needed for homeostasis.

The latest functional brain imaging studies on acupuncture illustrate such modulatory neural and autonomic responses in various parts of the brain, including the limbic, paralimbic and subcortical gray areas, as well as the cerebellum.

**Evidence of Effectiveness**

Research literature attesting to the effectiveness of GV 26 in treating cardiovascular depression began appearing in the English language veterinary literature in the 1970s. Over the following two decades, numerous papers documented the sympathomimetic effects of GV 26 in various species. Further studies showed that pretreatment with either alpha or beta blockers inhibited the sympathomimetic effect. Needling adjacent regions as “sham acupuncture” points failed to result in significant changes in cardiovascular function. More recently, a report on using GV 26 for resuscitation of neonatal kittens delivered by Caesarean section demonstrated success following unproductive cardiopulmonary resuscitation attempts.

**RESOURCES for TRAINING in VETERINARY ACUPUNCTURE:**

1. **MEDICAL ACUPUNCTURE COURSES:**
   Colorado State University: [http://www.aavma.org/director.html](http://www.aavma.org/director.html)
   Tufts University: [www.tufts.edu/vet](http://www.tufts.edu/vet)

2. **TCVM ACUPUNCTURE COURSES:**
   . AAVA: American Academy of Veterinary Acupuncture. [www.aava.org](http://www.aava.org)
   . IVAS: International Veterinary Acupuncture Society. [www.ivas.org](http://www.ivas.org)
   . Chi Institute. [www.tcvm.com](http://www.tcvm.com)

**TCVM HERBAL THERAPIES THAT WORK WITHOUT NEEDING TO KNOW TCM**

(*Easy to find these at Chinese herbal suppliers such as the ones listed under resources)*

1. Yunnan Pai Yao: Perioperative, hemangiosarcoma, coagulopathies, wound healing
2. Huo Xiang Zheng Qi San: Acute and chronic diarrhea
3. Curing: Bloat, indigestion, nausea, loss of appetite, overeating
4. Yin Chiao: Early beginnings of head cold, low grade fever, headache
5. Pe Min Kan Wan: Chronic stuffy nose, thick yellow-green discharge
6. Ba Zheng San: UTI, vaginitis
7. Amber Stone Transforming Formula™: Cystic calculi (any type), crystalluria (any type)

**DIETARY THERAPIES**

“You are what you eat” may be more than just a catchy phrase. Our daily nutrient intake provides the building blocks for maintenance of health, tissue repair and energy. It is well documented in the literature that the processing of foods, both human and pet, creates by-products that have a proinflammatory and insulin dysregulating effect. These two side-effects from eating processed foods are at the root of many degenerative
health conditions. In human integrative medicine inflammation and insulin dysregulation are known collectively as “Metabolic Syndrome” or “Syndrome X”.

The feeding of homemade diets and unprocessed foods can help to reverse the chronic effects of longterm ingestion of these by-products of food processing. Kibble and canned foods both contain these potentially toxic by-products. When carbohydrates and protein are heated at high temperatures, and when they are also exposed concurrently to high pressures, a chemical reaction occurs called the: “Maillard Reaction”. Bread crust forms as the result of this Maillard reaction, also known as the “Bronzing Effect”. The chemical name for these new compounds that are created by food processing is: Advanced Glycosolation End products, which is given the acronym: “AGE’s”. Studies have shown that these AGEs contribute to pro-inflammatory processes in the body, and to the aging process as well. (3)

There are other problems associated with processed commercial foods. Food storage mites can create a substantial impact on atopic dogs. (4) Reactive oxidative species (ROS) are also created by food processing (5), and many degenerative conditions are the result of tissue damage secondary to these free radicals’ impact on delicate living tissue (6). Chemical preservatives may have an adverse effect due to their long term usage, even if the amounts ingested at each meal have been measured to be not toxic. (7) Aflatoxins and other mycotoxins are commonly found on grains (especially corn and wheat) that have been stored for a while, which is usually the case in the manufacture of commercial kibble (8, 9) Appropriate levels of essential or necessary nutrients may not be present in commercial diets. One example of this is the recent report of cardiomyopathy in Newfoundland dogs secondary to taurine deficiency when fed a commercial dog kibble. (10)

Home prepared diets for companion animals can also provide other benefits to companion animals other than improved nutritional intake. There is so much talk these days in Veterinary medicine about the “bond-centered” practice. Preparing food at home for one’s pet is one of the most bonding experiences you can imagine. For patients with terminal diseases, this is an opportunity for the pet’s guardian to minister to their beloved critter in their last days, weeks, or months on earth. Many pets with chronic or terminal diseases will become fussier about their diets. Many times its not the brand or the meat type that is in the commercially processed kibble, but it is the kibble itself that these animals will not eat. Switching them to a homemade diet can have very positive effects.

In recommending a homemade diet, especially one that contains raw meat, it takes consultation time for the veterinarian to educate the client to ensure that the food preparation will be nutritionally adequate and safe. In the marketplace there are now fresh frozen raw diets, including one that has passed AAFCO feeding trials. Veterinarians can sell these diets in their clinics, thus providing an additional income stream, similar to income generated by the sale of kibble and canned diets.

Research conducted at Colorado State University’ Veterinary Teaching Hospital supports that high protein and lower carbohydrate diets, associated with higher levels of healthy fatty acids, including fish oil fatty acids in high dosages, and supplemental arginine, has shown statistically significant improvement in survival times in canine lymphoma patients. (11) Home made diets or commercial raw food diets can supply these same nutritional components and proportions, and have comparable effect when supplemental fish oil and the free form amino acid l arginine are included in the diet. Some animals lose interest in the Hills prescription diet, N/D™. Homemade diets can be more palatable and keep a cancer patient eating, which is very important to their therapy.

Information on home made diet recipes can be found in a number of published books. (add citations including Strombeck, etc.) There are several websites designed to help with diet formulation (12). This author has developed a methodical process for understanding the principles and practices that underlie homemade diet preparation. (13, 14).

HOME MADE DIET: PRINCIPLES AND PRACTICES

Instructing clients in the preparation of safe and nutritious home made food takes time. This author spends a significant amount of time in an exam room setting or in a group class to explain the details involved in diet preparation. Home made diets are not for every client. Many clients are unable to prepare wholesome meals for themselves. It is unreasonable to expect that these clients can follow through consistently and accurately with home diet preparation for their pets. During the food preparation discussion, attempts are made to have an interactive dialog during which clients can express their concerns regarding the use of raw meat, bones, specific types of foods, and amounts of macronutrients such as protein, and the use of grains as a carbohydrate source. Clients are becoming increasingly more knowledgeable and informed about these food preparation considerations, although in many cases their source of information may be based on half-truths and emotional bias. The internet has been a source for information that many clients are accessing. Unfortunately it is not always a reliable source of information. The information is often tainted by mercenary motivations or adherence to a position. Many individuals interested in improving their animals help go to these sources of information, or receive anecdotal information from an acquaintance about something that they may have heard about, or which may have worked in
one case for their pets, and they generalize this case to be true for all animals. Many people have a cult-like adherence to these ideas, some of which could be harmful to their animals.

Some examples of the misinformation that clients may be coming into a veterinarian’s office with include the notion that all animals, regardless of their age, weight or health status need to eat high protein diets, consisting solely of raw meat. Another commonly held misbelieve or “Urban Legend” is that carbohydrates, and particularly grains are the cause of many diseases, including cancer, Cushing disease and thyroid disease.

This author spends a lot of time trying to debunk these myths. These clients are potentially terrific clients to refer to a veterinarian to have. They want to improve their pets health, they are willing to go to a great deal of effort and expense to do so. They are simply “misinformed,” and thus, “misguided.” By taking extra time with them, and kindly and gently explaining to them why these ideas they hold are not true for all critters, and might even be harmful to some, including their own, these people usually come around. People inherently respect the authority position of a veterinarian or physician as a resource of truthful information, and it is not hard to reclaim their adherence to a more moderate approach to natural pet health with a little bit of education and communication.

This author has tried to make the meal preparation as simple as possible, in order to facilitate compliance. Following the giving of this advice, the author asks clients to return to the office in 30-60 days for a recheck visit to discuss the clients trials and tribulations and success with the diet preparation. At that time the patient is reweighed and re-examined. If deemed appropriate, blood tests such as creatinine, BUN, hematocrit and serum albumen are performed, and fecal examinations may also be conducted to check for nutritional sufficiency, parasites and food-borne pathogens, respectively.

STANDARDS OF MEASUREMENT:

As part of the effort to simplify the food preparation process, this author recommends that clients use volumetric cup measurement which is easiest for day to day food preparation. There are portion measurements are more accurate if the vegetables are chopped up fine, the meat is ground or chopped into small cubes, and the starches are well cooked to a porridge-like consistency. This way there will be no air in the cup measurements, and since the food density is fairly uniform (a little light for the veggies and a little heavy for the meat), volume is approximately equal to weight. Weight measurement of the food is more accurate for precise nutritional calculations, but can be more of a “chore” for the clients.

FEEDING GUIDELINES: The “Circle of Nutrition”

How much to feed and what portions of macronutrients to recommend need to be individualized for a specific patient. Does the patient need more protein to address protein loss through the bowel or kidneys, obesity or diabetes, growth, wound healing or performance? Does the patient need less protein due to azotemia or other concerns? How about the amount of calcium that needs to be supplemented? It certainly would be different for a giant breed versus a toy breed. More when we are dealing with fracture repair and nutritional Hyperphosphatemia, and less when we are dealing with hypercalcemia due to a paraneoplastic syndrome or hyperparathyroidism (primary or secondary). How about the amount of carbohydrate to feed? And what type of carbohydrate? If the patient is diabetic, then the glycemic index of the carbohydrate may have a bearing on insulin demand. If the patient has gluten intolerance or food allergies or intolerance to grain, then avoiding grain sources of carbohydrates would be recommended.

The American College of Veterinary Nutrition recommends using the “Circle of Nutrition” approach when formulating a diet for a patient. The Circle of Nutrition describes an iterative process, whereby the patient’s health status and nutritional needs are first assessed, and from that assessment a nutritional “prescription” is written. A diet is then formulated or a ready-made diet is chosen to match that initial prescription, and is fed according to that patient’s energy needs and lifestyle considerations. The diet is fed for a given amount of time, which could vary based on the critical nature of that patient’s condition, and at the end of that initial feeding period, the patient is then reassessed. The reassessment could be a simple as a cursory physical exam and weigh-in, or involve diagnostic tests such as creatinine and BUN to assess the safety to an azotemic or potentially azotemic patient of the amount of protein in that first diet prescription. If this initial assessment indicates that the first diet prescription is working well in this patient, then the initial diet is continued. If, however that assessment indicates that the diet is not working for that patient, then based on this second assessment, the diet is changed accordingly. The iterative process continues until the nutritionist is comfortable with the patient’s response to the diet formulation or packaged diet prescription.

CANINE CUISINE

Feeding dogs ~1.5-2.0 cups of this diet for every 25 pounds (approx 10 kg) of ideal body weight per day supplies ~700 kcal and ~35 g protein/day as recommended daily for adult dogs. As a rule of thumb, this is approximately 1.5 -2 times the volume of dry food to get the same caloric density. Variables that
need to be accounted for include the caloric content of the individual foods in the recipe, the protein density per 100 kcal food, and the metabolism and activity level of the animal. Puppies will have increased caloric needs of up to 4-6 cups/25 pounds of weight, during their rapid growth phase. Remember that empirical adjustments need to be made for any patient on any diet, commercial or home made, based on individual metabolism the presence of disease, and moment-to-moment energy expenditures. In general adult dogs require about 1 gram of protein per pound of body weight per day. Resting energy requirements (RER) are defined by the equation:

\[ \text{RER (kcal/day)} = 70 \times (\text{BW}_{\text{kg}})^{0.75} + 70 \]

FELINE FARE

For cats, feed about 6-8 oz of the home prepared diet for each 8-10 pounds of ideal body weight per day to provide ~260 kcal and 23 g protein/day for a neutered adult cat.(6) In general a healthy adult cat needs about 2 grams of protein for each pound of body weight. Feline energy requirements are computed in using the same formula quoted above for canine energy requirements. Cats can be more unpredictable as far as amounts to feed, based on whether they are indoor, or outdoor cats, and their age. Indoor cats do not receive enough exercise, generally, and thus need to be fed 25-50% less to start. Increased amounts of food can be fed later, if the initial amounts are not sufficient to supply a feline patient’s needs. It’s a lot easier to put weight on a cat then to take it off!

CARBOHYDRATES

Complex carbohydrate rich foods: DOGS—25% -33% - 50% CATS—0%-10%-33-50%

Cooked grains (cook rice or barley wetter than usual, using 2.5-3 cups of water for each cup of grain); Oatmeal is easiest, owners can pour boiling hot water on top of the rolled oats and allow it to soak in, thus not needing to use a lot of heat, time in preparation, or necessitate cleaning up cookware later on.

With oats the meals can be made “on the fly” each day. Baked potatoes, yams, sweet potatoes and squash are all good complex carbohydrate sources. Simply have your clients use cup measurements of the cooked complex carbohydrates to put the meal together. Dry oat flakes are used in the diet measurements versus the cooked cereal to provide more caloric density to the meals. Less allergenic cooked grains such as buckwheat, quinoa or millet can be used as alternate starches for some gluten or grain sensitive patients.

PROTEIN

Protein-rich foods: DOGS—25%-33%-67% CATS—67%-75%-100%

Ground turkey or beef is recommended as the meat source, unless there are specific allergies identified. If clients want to go vegetarian (which is not recommended) then cooked beans, tofu, eggs and cottage cheese are recommended as substitutes for this fraction. Clients can mix meat with the above “vegetarian” protein sources to fill the requisite amount of cups required for the pet’s meal.

RAW MEAT?

This author recommends raw meat for its unadulterated content of nutrients, including food enzymes, but doesn’t push the issue with clients who are reluctant. Cooked meat has a higher caloric and protein density than raw meat so it is necessary to account for that when recommending portions to feed. Ground meat is easier to estimate its fraction by volume in this recipe. A problem with feeding “raw meaty bones” (a la BARF) is the variability in protein, fat and carbohydrate content from bone to bone, which makes it more difficult to estimate portions to feed. Clients get easily confused with the meaty bone approach, and this author has seen many cases of inadequate or over-abundant caloric and protein feeding with that approach.

VEGETABLES—“GREEN” FOODS

Vegetables: DOGS—10%-33%-50% CATS—0%-12.5%-40%

Vegetables are a great source of soluble and insoluble fiber, and are also a wonderful source of vitamins and minerals, anti-oxidants and other valuable phytonutrients. Vegetables can be served raw and or cooked, but in every case it is recommended that they be chopped up finely in a food processor and mixed in with the ground meat and cooked complex carbohydrates. Cats may need the vegetables to be pureed, or for convenience can be fed a vegetable baby food without onions or garlic.

Seaweed (kelp, dulse, etc.), alfalfa, nettles, lecithin, spirulina, chlorella, wheat grass and/or barley grass juice powder can be added to each meal to improve its nutrient profile. (1/8-1 tsp per meal)

FATS and OILS

Healthy fats are provided to dogs using flax seed oil, and to cats with fish oils such as cod liver oil or salmon oil. Oil contains ~40 calories/tsp. Dogs are given about 1 tsp of oil/15 pounds/day to provide about 5-15% of their
total consumed energy from fats. Cats are given about ½ tsp of oil/10 pounds/day. Flax seed oil provides both linoleic acid (essential) and alpha linolenic acid (possibly essential), an omega 3 fatty acid in approximately equal proportions.

Feeding flax seed is another way to provide fresh vegetable oil, and also provides soluble fiber, vitamins, minerals and phytolignans. Flax seed needs to be ground freshly just before serving or needs to be soaked for 20’ before adding to the diet. It can be added to the vegetables just before they are ground up in the food processor. Flax seed contains 30% oil, so it is recommended that 1 Tbsp per 15 pounds per day be added to the dog or cat’s diet. For cats this is usually about 1.5 teaspoon of freshly milled seed per meal. The fiber portion of the milled flax seed will help manage hairballs.

Flax seed oil contains the extremely heat-labile omega three fatty acid alpha linolenic acid (ALA). Following pressing, rancidity of the ALA can begin as early as 12 weeks, even when the oil is stored in a cool dark place. Freezing the oil will substantially increase its shelf life before rancidity develops, but each time the oil needs to be served it needs to be defrosted in order to enable it to pour.

**CALCIUM:PHOSPHORUS**

Dogs and cats have a much higher calcium requirement than do humans, estimated to be 5 times the average requirement for humans. For that reason it is important that any homemade diet have adequate calcium supplementation appropriate to the needs of the patient. The Calcium RDA for dogs and cats is about 1000 mg calcium per 25 pounds. The calcium RDA for humans = 400-1200 mg/day depending on size and metabolic age. Assuming the average human weight to be 70 kg or 150 pounds, its approximate calcium need could be 1200 mg per day. A dog of the same 150 pound weight would need 6000 mg daily of calcium.

Due to the high phosphorus content of muscle and organ meats and of grains, it is important to add a source of calcium to provide adequate calcium as well as a balanced ratio of calcium to phosphorus in the animal’s diet. Total daily need for calcium as a crude estimate, would be 0.5g-1.0g of calcium per 25 pound dog. is enough for this balance, based on the calcium content of the specific foods fed and the renal function of the individual.(6)

In the wild, predators eat the bones of their prey. It would be uncommon in the wild for animals to consume the quantities that are recommended in some diet plans such as the raw meaty bone BARF diets. Sources of calcium other than raw bones include: Dried bone meal, dried egg shells, oyster shell, mineral-rich plants such as seaweed, coral calcium, alfalfa, nettles, or green leafy vegetables.

**FEEDING THE LARGE BREED DOG-PUPPY**

**Energy:**

The energy requirements for any individual puppy will depend on breed, age, neuter status, environment and activity level. However, in general, growing puppies require twice the energy that a mature adult requires for maintenance. The need is greatest right after birth and decreases as the dog grows. The rate of growth of the dog is directly influenced by the dietary energy intake. Puppies should be fed based on their energy needs. However developing a calculation to estimate these needs is difficult, and often impractical. A puppy’s energy needs will be continuously changing as the dog grows. A body condition scoring (BCS) system provides an easy and practical way to evaluate the effectiveness of the amount of food being fed in terms of affecting the body mass of the growing cat or dog, and therefore how well the diet and amount fed are meeting the young animal’s appropriate energy needs. Current thinking recommends maintaining a BCS of (3) during growth will reduce excess body fat, help control excess growth, and reduce the development of skeletal abnormalities. Body condition scoring needs to be taught to owners/guardians and should be done every two weeks during puppy growth. Maintenance of an optimal BCS can be managed by altering the amount of food fed.

**Calcium:**

The absolute level of calcium in the diet has been shown to be more important than the calcium/phosphorus ratio with respect to skeletal development. Excess dietary calcium has been shown to significantly increase the incidence of developmental bone diseases in growing puppies. Chronically high dietary calcium intake increases the frequency and severity of OCD. Its easier for dogs to adjust to slightly lower serum calcium levels, by mobilizing bodily calcium stores, than it is for the body to deal with eliminating excess calcium.

A calcium of 1.1% (dry matter basis) is recommended for high risk growing puppies. This translates into approximately 1100 mg of calcium daily for a 50 pound puppy. 110 mg of calcium daily for a 5 pound puppy.

**Protein**

Protein requirements of growing puppies are higher than protein requirements for adult dogs. Both quality and quantity of protein in the diet are important to supply the proper balance of amino acids. Amino acids are vital for growth and development.
Protein excesses in growing large breed dogs has not been shown to adversely affect skeletal development. Excess dietary protein only contributes to the energy content of the food, it does not accelerate the growth of bone or muscle. It is recommended that a growth formula for large breed dogs contain a high quality protein, with 28% or greater protein content (dry matter basis).

**SOURCES of CALCIUM**

Raw bones, bone meal, calcium supplements, seaweed, green leafy vegetables, milk, mezotrace, oyster shell, alfalfa, nettles, horsetail, commercial diets, about 100 mg calcium per 5 pounds per day, total daily calcium consumption, assuming a 30-40% absorption from dietary sources. This may translate into ¼ to 1 teaspoon of a calcium rich substance each meal, or a raw bone or two per meal can also provide adequate daily calcium.

**BONES as CALCIUM SOURCE**

A small amount of raw bone can be fed as a means of providing healthy exercise for the gums and jaw muscles, and as an additional source of dietary calcium. Raw chicken wings, backs and necks (small cancellous bones) have been recommended in this author’s practice without a single incident or problem to date (5 years).

Clients are advised to exercise caution, that it is not appropriate to feed raw bones to some dogs (the gulpers or competitive feeders or those with small mouths or poor dentition), and clients are informed that this is a practice that they must assume at their own risk.

**INTRODUCTION OF THE NEW FOOD TO THE OLD PET**

Cats may need added palatability enhancers to assist in their transition to a homemade diet. Introduce new foods slowly and gradually to all animals, especially cats.

The use of bribe foods or familiar foods can assist greatly in convincing cats to make the transition. I often quote Mary Poppins: “A spoonful of tuna helps the new food go down.”

Using strongly smelling highly tasteful foods in small amounts to flavor the new food may assist in the transition, or may be necessary throughout the feeding process. Cats that are dry food junkies may never make the transition. They imprinted to dry food at weaning so strongly when they were kittens that they don’t recognize anything else as legitimate food. A cat that won’t eat canned food or tuna fish or “people” food, probably won’t eat a homemade diet readily. For those cats that eat canned food you can gradually add increasing amounts of homemade diet to the canned food ration as a means of introduction of the new unfamiliar tasting food.

**THE “TABLE-SCRAPS” DIET**

It is appropriate for veterinarians to NOT recommend the feeding of table scraps because they may unbalance a complete commercial diet, or add unnecessary or unhealthy amounts of calories and/or protein to an animal’s balanced nutritional regimen. Also some table scraps may be excessively fatty and promote pancreatitis or diarrhea and vomiting in some patients. However, for clients who pay attention to providing themselves and their families with wholesome nutritious and balanced meals, it is not unreasonable to suggest that they simply divert some of the food intended for their family to their animal in the proportions and amounts that their veterinary nutritionist recommends. After all, before the inception of commercial foods, this is how companion animals were fed.

**RECIPE DRIFT**

One factor that is important to take into account is that human nature being what it is, it is not uncommon for clients who are preparing food for their animals to substitute other food materials or use differing proportions and amounts than have been recommended by their veterinary nutritionist. The professional recommendations have been given in order to provide for that animal a complete and balanced diet. Changing the diet this way is called: “Recipe Drift”, and potentially could be a source of inadequate nourishment of the animal. For this reason, it is important that during annual examinations and other medical appointments that the client be queried as to the exact food materials amounts and proportions that are actually being fed. It takes a little more time to do this, but clients are appreciative of your interest in their animal’s diet, and it helps to ensure nutritional adequacy.

**COMPROMISE DIETS**

If this were the “best of all possible worlds”, then we would all have enough time and resources to prepare every meal for ourselves and for our pets from scratch from totally organic and range-fed sources. Since for most individuals, this is not the case, I recommend for flexibility an approach to feeding called the “Compromise Diet.”

A compromise diet is inclusive of the best possible meals that can be served, under whatever the moment to moment circumstances may be regarding kitchen facilities, preparation time, storage capacity, and food material
availability. Many clients will express the desire to prepare meals for their pets on a regular basis, but actually cannot make the time to do that in their busy lives.

I would rather clients prepare one good meal a week. At least their pet will get some wholesome nutrition. Combining meals of the best commercial food with healthy leftovers from family meals or healthy restaurants is a simple way to do this. I have the client offer the same proportions of carbohydrate, protein and vegetables as they would if they were preparing a meal from scratch.

Many people eat well, so providing their starch de jour, protein de jour and veggies de jour can offer a superior plane of nutrition to their pets without much effort. This is the table scrap diet. If people are traveling with their pets, they can go to a restaurant and order a beef patty, baked potato or rice pilaf and steamed broccoli, and they are “good to go”.

Using the feeding guidelines suggested above, for each cup of fresh food offered, be sure to have the pet guardian remove a half cup of kibble, to approximately account for the additional carbs and protein. This way the pet won’t be given an excessive amount of calories or grams of protein that are not needed.

I have found that by being too rigid and demanding too much perfection from my clients turns many of them off from homemade diet preparation. If they know that when their lives get busy it’s OK to bail on homemade diet preparation, at least in part, and its OK to go back to commercial foods, if only briefly, and its OK to mix commercial diets with homemade diets or with left-overs as long as consideration is given to not feed an excessive amount of carbs and protein.

**TABLE SUMMARIZING INGREDIENT PROPORTIONS for CONDITION-SPECIFIC DIETS**

<table>
<thead>
<tr>
<th>PATIENT STATUS</th>
<th>DOG PROPORTIONS %CHO:%PRO:%VEG</th>
<th>CAT PROPORTIONS %CHO:%PRO:%VEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELL-PET</td>
<td>50:25:25 or 33:33:33</td>
<td>10:75:15</td>
</tr>
<tr>
<td>GROWTH</td>
<td>33:33:33 (can feed up to 6 cups/25#/day)</td>
<td>5:90:5 or 0:100:0</td>
</tr>
<tr>
<td>LIVER</td>
<td>33:33:33*</td>
<td>0:90:10</td>
</tr>
<tr>
<td>ALLERGIES</td>
<td>0:50:50** or 60:20:20</td>
<td>0:90:10</td>
</tr>
<tr>
<td>CANCER</td>
<td>20:50:30</td>
<td>0:90:10</td>
</tr>
<tr>
<td>KIDNEY***</td>
<td>50:25:25 or 60:20:20</td>
<td>20:60:20</td>
</tr>
<tr>
<td>OBESITY</td>
<td>37.5:25:37.5 or 33:33:33</td>
<td>0:90:10</td>
</tr>
<tr>
<td>DIABETES</td>
<td>33:33:33****</td>
<td>0:90:10</td>
</tr>
</tbody>
</table>

**NOTES:**

*protein sources should be branched chain amino acid rich, such as egg and dairy and poultry; carbohydrates need to be complex with low glycemic index

**avoid carbohydrates with carbohydrate-based allergies; reduce amount of protein with protein-based allergies

***degree of protein restriction based on degree of azotemia measured against amount of protein loss from kidney and serum albumen determinations

****use low glycemic index carbohydrates

**INTEGRATIVE MEDICINE**

**CLINICAL EXAMPLES OF BLENDING OF CONVENTIONAL WITH ALTERNATIVE THERAPIES**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CONVENTIONAL RX</th>
<th>ALTERNATIVE RX</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDISONS DISEASE</td>
<td>Gluco- and mineralo- corticoid supplementation</td>
<td>Licorice root and adrenal extracts</td>
<td></td>
</tr>
</tbody>
</table>
## Liver Disease

| Ursodiol, prednisone, antibiotics | Diet, milk thistle, NAC, ALA, SAMe, EPA/DHA, B complex, phosphatidylethanolamine |

## Arthritis

| NSAIDs, steroids | GAGs, MSM, AP, lifestyle changes, anti-inflammatory herbs, EPA/DHA |

## Cancer

| Surgery, radiation, chemotherapy, euthanasia | Diet, EPA/DHA, arginine, glutamine, probiotics, medical mushrooms, transfer factors, IP6, Ozone, AP, Homeopathy, cell wall fractions, orthomolecular IV therapy |

## Allergies

| Steroids, antihistamines, hyposensitization, hypoallergenic diets | EPA/DHA, AOX, Homemade diets, homeopathy, AP, herbal therapies, immune balancing agents, addressing “Leaky Gut” with probiotics and glutamine |

## Pharmaceutical Toxicity

| Discontinue pharmaceutical such as phenobarbital, NSAID, corticosteroid, chemotherapy agent | Milk thistle, EPA/DHA, probiotics, AOX, NAC, ALA, SAMe, addressing “Leaky Gut”, CoQ10, carnitine, taurine |

## Cardiovascular Disease

| Digitalis, lasix, enalapril, benazapril | EPA/DHA, taurine, carnitine, CoQ10, hawthorn, magnesium, potassium, herbal diuretics |

## Renal Disease

| Modified protein diet, fluid therapy, phosphate binders | EPA/DHA, B complex, probiotics, NAC, glutamine, arginine, AP, TCM herbs, homeopathy |

## Behavioral Disease

| Psychopharmaceuticals, behavioral modification training, euthanasia | Thyroid status, B complex, phosphatidylethanolamine, DHA and EPA, tryptophan, kava, SJW, TCM formulas, AP, Flower Essences, TTouch |

### The Principles of Integrative Medicine: “Grub Guts & GALT”

Integrative medicine recognizes several principles that underly the pathophysiology of chronic disease patterns. The over-riding principle, though, is that all of the systems of the body are interrelated. One corollary of this principle is the mind-body-spirit connection. Dr. Candace Pert described this in her landmark book: “The Molecules of Emotion”, which established the interdisciplinary field of psychoneuroimmunology. What we think and feel can “somatize” (manifest physically in the body) and convert into physical dysfunction or disease. One commonly found example of this are stress-induced ulcers. Another example is the case of acute cardiomyopathy and heart failure secondary to the extreme grief associated with the loss of a loved one or an important relationship. This is what can happen when you have a “broken heart”.

According to integrative medicine principles, the digestive tract is more than simply a means of deriving nourishment. In addition to the very important functions of digestion and absorption, the gastrointestinal tract is also the largest organ of the immune system in the body. Estimates range between 60-80% for the percentage of lymphocytes that reside in the GI tract. When we eat food, we want the GI tract to absorb all the good stuff, but we also want it to keep out all of the potentially toxic, antigenic and pathogenic materials that food also contains. How can the bowel have the innate intelligence to exclude noxious materials, but allow for the entry of nutrients? The answer to this question lies in several mechanisms that constitute 4 levels of protection by the barrier system of the GI mucosal wall.

The GIT (gastrointestinal tract) has the greatest amount of surface area exposed to the environment. In humans, the skin has less than 10 square meters of surface area, whereas the lungs have about 140 square meters of exposed surface area! The gastrointestinal tract in humans, though, has 200 square meters of surface area exposed to the environment. These surface area relationships are comparable in our animal species as well.

This is why the GIT has such a specialized defensive system that combines both immune defenses as well as barrier and secretory and digestive defenses. The GALT (Gut Associated Lymphoid Tissue), in humans produces...
10 grams of immunoglobulins daily, of which 60% is secretory IgA. There are estimated 1010 lymphocytes per linear meter of bowel in humans. These relationships are comparable in our animal species.

Intestinal permeability is a double-edged sword. The GIT has the paradoxical double role of both needing to optimally absorb necessary nutrients, while at the same time excluding toxins, pathogens and antigens.

The GI mucosal barrier is maintained by several mechanisms which can be disturbed by a variety of factors associated with GIT injury or infection. These barrier maintenance mechanisms will be discussed in the next section. Bacterial infections can cause injury to the tight junctions that hold intestinal mucosal cells together and that in part form the mucosal barrier of the GIT. Without the protection that the tight junctions provide, bacterial cytotoxins enter the host, paving the way for bacterial invasion.

Bacterial overgrowth secondary to the use of H2 blockers and antacids can lead to proximal gut colonization by pathogenic bacteria who are “attracted” to the imbalance in the pH. Immunosuppressed or protein-deficient patients can have decreased slgA (secretory IgA) production which impairs the immunoprotective value of this secretory immunoglobulin. 60-70% of the lymphocytes in Peyers patches are B-cells which are the precursors to the slgA -secreting plasma cells. slgA is found in the mucous layer (or glycocalyx) that overlies mucosal epithelia where it functions to decrease the adherence of viruses, macroglobulins and specific bacteria.

The liver provides defensive activity both in terms of its phagocytic Kupffer cells, and in terms of its detoxification enzyme systems. The liver has a dual-phase system of detoxification. Hepatic enzymes decontaminate toxins and metabolic toxic by-products as well as help to degrade antigens and antigen/antibody complexes. Kupffer cells are the sessile hepatic macrophages that are found in hepatic sinusoids and play an important role in the GI immune system by removing bacteria, particulate matter and toxins.

Digestive functions themselves can also serve protective functions within the GI immune system. For instance, HCL, which serves a vital function in protein digestion, also denatures many bacteria due to the acidic environment it engenders, especially when lowered pH is combined with prolonged gastric emptying time.

Many of our patients are on antacids and H2 blockers such as famotidine or cimetadine. These can help many clinical conditions, but may also exacerbate conditions where normal stomach HCL secretion is essential. The denaturing of pathogens in the stomach, the cleaving of pro-proteolytic enzymes are two examples of the potential problems that long-term use of antacids can cause to your patients.

Intestinal mucosal cells also produce defensive protein molecules, known as Defensins which function as part of the non-specific immune system (intrinsic immune system) to reduce intestinal pathogens.

Peristalsis, or bowel transit time, helps to move pathogenic bacteria through the bowel before they have an opportunity to adhere and enter the host. Commonly used pharmaceutical agents such as vasopressors, corticosteroids and NSAIDs can also result in decreased GI mucosal cell mucus production and cause the subsequent loss of the bowel’s protective mechanical barrier function.

Contrary to the recommendations of folk medicine, prolonged fasting may do more harm than good in patients with challenged immune systems. (15). “Bowel rest” for more than 3 days has been shown to cause deterioration of the enterocytes population, which can lead to atrophy of the mucosal surface, alterations in bowel permeability and an overall diminution of gastrointestinal immune function. Studies have shown that early enteral feeding can improve splanchnic blood flow, and can improve immune system function. (16)

THE FOUR-PART INTESTINAL MUCOSAL BARRIER:

The first layer of this barrier is the glycocalyx that consists of mucus secreted by goblet cells in the intestinal mucosal villus. The formation of this mucus is dependent upon sulfation in the liver. If the liver is being challenged by toxins, drugs, etc, it may not be able to provide adequate sulfation to produce a protective mucus layer. This allows for the introduction of more toxins, which will further tax the liver and impede its nutritive and protective roles.

The second layer of this barrier is made up of the beneficial intestinal bacteria species such as Lactobacillus acidophilus in the upper GI tract and Lactobacillus bifidus in the lower GI tract which are embedded in this mucus-gel layer and adhere to the intestinal villus cell membrane, thus mechanically preventing the invasion of pathogenic bacteria. These gram-positive lactose-fermenting facultative-anerobic organisms also secrete enzymes and other molecules possessing antibiotic properties.

It has been recently determined that the cell wall fraction of these bacterial organisms has an stimulating effect on the innate immune system by means of the generation of immune-enhancing cytokines. This positive effect on immune function occurs when cell wall fractions are brought into contact with the immune system. Bacterial cell
The third protective layer of the bowel barrier system is provided by the tight junctions between the intestinal mucosal cells, providing a mechanical barrier to the introduction of unwanted compounds. With inflammation, infection and certain drugs these tight junctions can weaken, thus allowing the ingress of inappropriate compounds.

The fourth and last protective mechanism for the barrier function of the bowel is provided by the immune system. Through a complex process, antigens and pathogens and toxic substances can be recognized by the Gut Associated Lymphoid Tissue (GALT), which then elaborates the immunoglobulin sIgA, which is the first line of defense of the immune system for the mucous membranes of the bowel and the respiratory systems.

When the barrier function is disrupted, antigens and pathogens are allowed to gain entrance into the systemic immune system, first in the Peyer’s patches that are found contiguous to the epithelial mucosal cells that line the bowel, and then in the mesenteric lymph nodes, and finally these noxious substances can disseminate throughout the lymph nodes into distal regions of the body. When food allergens and pathogens are eliminated by barrier mechanisms and secretary IgA, there is no systemic reaction, mediated via the reactive production of IgE which leads to the histaminic response that is associated with hypersensitivity reactions. But, once this barrier is disturbed, these noxious compounds can enter the circulation and cause the symptoms we commonly associate with food allergies and food intolerances or sensitivities.

**“LEAKY GUT” = INCREASED INTESTINAL PERMEABILITY**

This condition where the barrier function of the bowel is disrupted is called “Leaky Gut”, and has been well-documented in both the human and veterinary literature (17, 18). It has been demonstrated that not only do symptoms of food allergies align with leaky gut, but a pathologic mechanism called “Bacterial Translocation” occurs in which commensal or pathogenic bacteria from the gut can migrate to other organs where they are not commonly found. Once in these distal target organs these “foreign” bacteria stimulate an inflammatory response, which is first localized to the organ system and then becomes systemic. Appropriately enough this systemic post-bacterial translocation phase is called: “SIRS” or systemic inflammatory response syndrome. One example of this is the polyarthritis associated in some patients with enteric salmonellosis infections (19). In the conventional model, SIRS is initiated by infection or tissue injury and then further exacerbated by bacterial translocation, which provides for the release of endotoxin, which stimulates pro-inflammatory cytokine and leukotriene release (TNF-α, IL-1, IL-6) which, with activation of PMNs and the production of ROS further amplify the inflammatory response.

Have you ever wondered why we see so commonly in clinical practice, patients that present with diarrhea who will then develop (either concurrently or following the first infection) a urinary tract infection? Anatomically, the urinary bladder is contiguous to the rectum. They share some venous drainage and lymphatic vessels. When the bowel’s barrier system is functioning within normal limits, an acute infection stays within the bowel lumen or within the bladder. But either due to the pathogenesis of the infectious diarrhea or when the bowel barrier has already been breached, the bacteria will translocate to the bladder, or visa versa. Of course transmission of pathogens can also occur externally from rectum to vulva from licking or contamination with feces of the vulva.

Following SIRS, if the condition does not find correction, it then progresses to the final and most serious stage, known as MODS or multiple organ dysfunction syndrome. This is where you have multiple organ involvement and a patient with refractory multiple symptoms. This is the underlying mechanism involved with many chronic and degenerative conditions, including both inflammatory and autoimmune disorders.

The first step in the correction of BT, SIRS and/or MODS is to correct Leaky Gut. Clients may understand how food allergies could relate to dysfunctional digestive barrier processes, but it is often difficult for a client to understand how digestive function can play a role in the pathogenesis of asthma, arthritis, chronic sinusitis, rhinitis or even epilepsy. For patients with chronic GI disease, such as chronic diarrhea, IBD or hepatitis, the connection between these disorders and Leaky Gut is easier to grasp. I think it is important to take the time necessary to explain to clients how Leaky Gut and the bowel barrier mechanism failure promotes these chronic diseases. An informed and educated client is a better partner for the complicated process involved in addressing these chronic diseases.

Often the “homework” for clients who want to pursue Integrative Medicine for their pets is quite extensive. These patients will be receiving home-made custom-designed diets, multiple nutraceutical and botanical supplements, and probably some degree of conventional pharmaceutical therapy as well. When a client understands why these tasks are necessary to re-establish healthy patterns, it makes it a lot easier for them to be compliant.

The following 4 step approach to correct this condition has been developed by the Functional Medicine group out of Gig Harbor, Washington. (20) It is called the “4-R Program”. I initiate this program in many of my patients, and
often will use as at least a part of this program for all of my patients. I have clinically seen it benefit these patients, repeatedly. Some patients with long-standing chronic disease issues may need longer exposure to these tools to effect any clinical change at all.

Some patients are so “stuck” in their pathology that it is possible that none of these tools will do any good. The only way to identify these difficult to address patients is by offering them these tools and maintaining them on them for at least 6 months before deciding that they are not working and at that point could be discontinued.

THE 4-R PROGRAM FOR LEAKY GUT AND CHRONIC DISEASE:

1: REMOVE pathogens allergens and toxins.

By lowering the “total load” (the body’s burden) of these troublesome substances, the immune system and liver do not need to work as much in processing them. This makes more energy available to these systems to direct toward re-establishing healthy patterns. Removal can be by elimination from the diet or environment, or by the use of agents such as antimicrobial agents to reduce the population of pathogenic organisms.

Summary of Appropriate Dietary Supplements and Medications:

- Dietary elimination trial—hypoallergenic diet; Well-balanced and individualized hypoallergenic homemade diets
- Parasitacides and/or anti-microbials if absolutely necessary
- Amoxicillin for clostridial overgrowths
- Fenbendazole or metronidazole for giardia overgrowths
- Albon for coccidiosis
- Botanicals such as cinnamon, garlic and oregon grape root and goldenseal selectively kill pathogenic bacteria over beneficial bacteria.
- Detoxicants and Anti-oxidants protect GI tract from damage from ingested toxins, antigens and parasites.
- Milk thistle
- Anti-oxidants
- Alpha lipoic acid
- Garlic
- Berberine-containing herbs to enhance systems of detoxification and further promote removal of pathogenic organisms

2: REPLACE digestive factors that are inadequate or absent.

Inadequate pancreatic or intestinal enzyme production leaves digesta only partially broken down, thus altering the environment in the bowel, providing opportunity for pathology to develop. The beneficial bacteria that produce short chain fatty acids (SCFA) from soluble fiber in the bowel need a narrow range of temperatures and pH, as well as adequate substrate for their activity. When food is only partially digested, the intermediate breakdown products of the ingested food that result is not conducive to the normal function of these probiotic species.

Some patients will have genetically inadequate pancreatic function, others will have acquired pancreatic function defects due to bouts of clinical or subclinical pancreatitis. Supplementing with either pancreatic enzymes or fungal source digestive enzymes can help these patients to better digest their food. I have found that pancreatic enzymes work best in those patients with abnormally low or low normal cTLI test results. For all the other patients I use fungal source digestive enzymes that have been derived from Aspergillus niger. Fungal source digestive enzymes function over a wider range of temperatures and pH conditions than both pancreatic and plant based enzymes.

For non-EPI patients I suggest fungal-source digestive enzymes for their 4R Program.

Hypochlohydria is the insufficiency of hydrochloric acid in the stomach. It can be due to genetic factors, disease factors such as pathogens attacking the parietal cells in the gastric mucosal lining, or an iatrogenic cause such as the rampant use of antacids such as cimetadine, famotidine and ranitidine. In the absence of HCL you get inadequate cleaving and activation of the proteolytic pro-enzymes present in the stomach. With inadequate protein digestion an number of problems can occur. Nutritional science is discovering the importance of adequate protein for a variety of necessary bodily functions involved in cell signaling and cellular repair and activity. If you are ingesting adequate protein dietarily, but your digestive system cannot break it down or absorb it, then you have a non-dietary protein deficiency.

Patients with hypochlorhydria commonly present with foul and putrid breath or eructation, and in some cases may even have very foul and putrid flatulence. Hypochlorhydria is considered to be a risk factor for helicobacter infections, and thus may underlie some cases of chronic vomiting in your patients. Unfortunately it is not easy to
measure stomach acid content, and thus there is no easy test to determine hypochlorhydria, other than by clinical signs.

Naturopathic physicians have been recommending the use of a supplement that is derived from beet root called betaine hydrochloride as a means of augmenting weak gastric hydrochloric acid levels. The supplement contains not just the betaine hydrochloride, but also pepsin which will directly help in the breakdown of protein molecules. The medicine comes in one strength and is dosed to effect. I usually recommend a single capsule be given 20 minutes before meals. If one capsule does not produce desired effects within a week, I then will double the dose, irrespective of patient size or species.

I dose patients with betaine hydrochloride when they are showing signs or symptoms of hypochlorhydria. Usually, if I am uncertain if hypochlorhydria is present, I will challenge these patients with 30 days on betaine hydrochloride and observe for improvement. If no improvement is seen with respect to the burping odors or vomiting, I will then discontinue the use of this supplement.

**Summary of Appropriate Dietary Supplements:**

- Digestive enzymes. With exocrine pancreatic insufficiency (even with borderline values) use pancreatic source enzymes. For all other cases use fungal source enzymes.
- Hypochlorhydria---use Betaine HCL: 1 capsule 20 minutes before meal
- Herbal bitters given with meals promote HCL secretion and healthy peristalsis
  
  E.g.: Oregon grape root or goldenseal
- Soluble and insoluble fiber perform important digestive functions. Soluble fiber provides for enhanced growth of beneficial bacteria which product SCFA (short chain fatty acids: Acetate, Butyrate and Propionate) which nourish colonicocytes, and insoluble fiber promotes peristalsis.
  
  E.g.: Psyllium, vegetables, flax seed meal, legume sources, bran, pumpkin, sweet potato, yams

**3: REPAIR Damaged Intestinal Mucosal Barrier**

**Appropriate Dietary Supplements:**

The use of the free form amino acid L glutamine has been found to reduce bacterial translocation (21), and to increase the protein synthesis of the enterocytes which enables them to increase their rate of self-repair. The phospholipid-rich compound lecithin, and the omega three fatty acids commonly found in fish oil, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are also integral to the repair of intestinal mucosa damaged from disease, stress or diet. (22) Antioxidants reduce ROS damage to intestinal mucosa. Zinc and Vitamin B5 (pantothenic acid) are involved in the mucosal repair process. Soluble fiber promotes SCFA production which provides nourishment for repair of damaged lower bowel mucosal cells

- L glutamine (500 mgs-5 gms BID)
- Anti-oxidants
- Vitamin C: (250-500 mg BID or to patient tolerance)
- Vitamin E: (d alpha tocopherol or mixed tocopherols) 100-1200 IU depends on patient condition)
- Selenium (25 mcg – 200 mcg/d)
- EPA/DHA (180 mg EPA/5-10 pounds per day, watch for pancreatitis!—start gradually and work up to optimal dosage—it can take upwards of 65-70 days for clinical effectiveness of this supplement)
- Phosphatidylcholine or lecithin: Granules: ¼ teaspoon- 1 T per meal, with meals; Capsules (500 mg) 1-3 BID
- Zinc picolinate (5-30 mg/day) (Improves repair of leaky gut) (37)
- Pantothenic acid (vitamin B5) (5-25 mg BID)
- Soluble fiber such as inulin and fructo-oligosaccharides (500 mg- 2 g/meal)

**4: REINOCULATE w/Probiotic MicroFlora Cultures and accessory nutrients to create a healthy bowel ecology**

Normal indigenous GI bacterial flora are an extremely important factor in maintaining the healthy GI mucosal barrier. Anaerobes are the most numerous bacteria in the bowel. These commensal beneficial microorganisms compete with potential pathogens for nutrients and for attachment sites to the mucosa, and thereby inhibit bacterial overgrowth by the pathogenic gram negative bacteria. Antibiotics can upset this balance between the good bugs and the bad bugs. H2 blockers, as well as hyperosmolar enteral diets can result in bacterial overgrowth and colonization of the stomach.

**Appropriate Dietary Supplements:**
• PROBIOTICS: (500 M –10 B CFU/meal)
  • Lactobacillus acidophilus
  • Lactobacillus bifidus
• PREBIOTICS: (500 mg-2 gms/meal)
  • Fructo-oligosaccharides
  • Acacia fiber
  • Psyllium
  • Chicory
  • Inulin
• SYNBIOTICS = PREBIOTICS & PROBIOTICS = Improved effect due to synergism
• GI IMMUNE SUPPORT AGENTS help to re-establish healthy immunological function in the bowel.
  • Arabinogalactans
  • Colostrum
  • Immunoglobulins,
  • Lactoferrin derived from colostrum and serum products)
  • Whey globulin proteins: (¼ to 1 T on empty stomach several times daily if appropriate),
• Medical mushrooms
  Agaricus blazei
  AHCC
  Cordyceps
  Coriolus
  Ganoderma
  Maitake
  Shiitake

FUNCTIONAL MEDICINE (a subset of Integrative Medicine)
Developed and promoted by Jeffery Bland, PhD and founder of the institute for functional medicine (IFM) in Gig Harbor, WA. Dr. Bland developed and tested the 4R program clinically before introducing it to clinicians.
“Functional medicine is a science-based field of health care that is grounded in the following principles:
• Biochemical individuality describes the importance of individual variations in metabolic function that derive from genetic and environmental differences among individuals.
• Patient-centered medicine emphasizes "patient care" rather than "disease care," following Sir William Osler’s admonition that "It is more important to know what patient has the disease than to know what disease the patient has.”
• Dynamic balance of internal and external factors.
• Web-like interconnections of physiological factors – an abundance of research now supports the view that the human body functions as an orchestrated network of interconnected systems, rather than individual systems functioning autonomously and without effect on each other. For example, we now know that immunological dysfunctions can promote cardiovascular disease, that dietary imbalances can cause hormonal disturbances, and that environmental exposures can precipitate neurologic syndromes such as Parkinson’s disease.
• Health as a positive vitality – not merely the absence of disease.
• Promotion of organ reserve as the means to enhance health span.” (From website : www.functionalmedicine.org)

BOTANICAL AND NUTRACEUTICAL VETERINARY THERAPEUTICS
Herbs are becoming used more commonly by clients for their pets. As a result, veterinarians need to know about these herbs in order to evaluate their impact on their patients. Additionally, veterinarians need to be able to advise their clients in the safe and judicious use of herbs for their animals. The following information will help you as a veterinarian understand better these botanicals and nutraceuticals and their potential benefit or detriment to your patients.
Later in this section this author will discuss 10 specific botanical compounds that can be important adjuncts to a conventional veterinarians practice of medicine.

The complex constituents of herbal remedies allows them to have a broad range of therapeutic actions. Thus, effective herbal dosage regimens usually are not as precise as those for pharmaceutical medicines. Patient response time to many natural remedies may take days or weeks to become evident, making it much more difficult on the part of the practitioner to judge the effectiveness of the therapeutic protocol chosen for that patient. Natural remedies also may be more difficult to administer. Most veterinarians do not know how to evaluate an herbal product for potency, quality and safety, much less therapeutic effectiveness.

Clinical success with a patient involves more than just knowing the nature of the disease. Practical considerations concerning the therapeutics for a patient are as important as any other portion of that patient’s medical workup. One could have the most effective therapeutic regimen for a patient, but if one is unable to administer it adequately, the patient will not benefit. A practitioner may know what herb to use for a given condition, but when they go ahead and purchase this herb from a supplier, it doesn’t work. Was the therapeutic choice of that specific herb wrong, or is there another reason for the failure of the herbal therapy such as lack of patient compliance or inadequate potency of the herbal formula?

Not all herbs or herbal formulas are created the same. The same herb, supplied by different suppliers can have entirely different potencies or biological effects. How can a practitioner effectively predict clinical outcomes without standardization of content and potency of natural medicines?

To successfully treat your patient with any type of medical therapeutic, whether it be “natural” or pharmaceutical in nature, there is a six step process that every clinician must go through:

1. Identifying the problem in the patient
2. Choosing the appropriate type of therapy for that patient
3. Selection of the therapeutic product
4. Assignation of a dosage regimen
5. Administration of the product to the patient

THE HISTORY OF BOTANICAL MEDICINE

Although no direct evidence exists explaining how humans and animals initially learned which plants were safe to use as foods or for healing, there is anthropological evidence that supports the premise that plants have been used by humans for themselves and for their animals since the dawn of humanity 60,000 years ago (23). The Roman herbalist Pliny wrote in the first century AD of the discovery of the medical uses of plants by animals such as swallows, dogs and deer as having been influential in teaching humans which plants to select. (24)

Research in the field of zoopharmacognosy (the study of animals’ recognition and utilization of wild plants) demonstrated that elephants, monkeys, bison, pigs, civets, jackals, tigers, bears, wild dogs, rhinoceros, mole rats and desert gerbils use plants as medicines. (25)

Physicians in the US studied and relied on plant “drugs” as primary medicines through the 1930’s. Up until the 1930’s, medical schools in the US taught basic plant taxonomy, pharmacognosy and medicinal plant therapeutics. Physicians routinely used plant drugs as their primary medicines. In fact, the word “drug” is derived from a word for the root of a plant. In 1870 the US Pharmacopoeia listed 638 herbs in its publication. By 1990 there were only 58 listed. (26). Some of these plants fell out of use due to their weakness or toxicity, however the majority of clinically useful plants were replaced by pharmaceuticals which could be patented, thereby capable of generating larger profits, as well as supporting the increased industrialization and materialism of contemporary conventional medicine. (27)

Herbal medicine is a vibrantly alive discipline that is being used actively in many cultures throughout the world today. There is no question that botanical preparations can have a beneficial or therapeutic effect. The World Health Organization estimates that 80% of the world’s population relies on herbs for their primary health care needs. In France and Germany it has been estimated that 30-40% of all medical doctors rely on herbal preparations as their primary medicines. (28)

THE “DOCTRINE OF SIGNATURES” AND THE “DOCTRINE OF SIMILARS”

These are ancient concepts stating that the appearance of a plant, or plant part, or the environment that the plant grows in, or the season that the plant grows, are reflections of that plant’s uses. Each herb has a sign or “signature pointing to its medicinal virtue. The origins of the Doctrine of Signatures is shared with the Doctrine of Similars, which is expressed in the saying: “Like Treats Like”. This doctrine states that the herb which holds the cure is
similar to the organ, tissue, or constitution that it acts upon. The herb may even be similar to the disease state being expressed.

There is also a correspondence between our emotions and the environment. We often express our emotions in terms of the natural world. We say we feel “bright” or “hot”. Thus there can be a correspondence between our emotions and plants. The plant which has learned to deal with a certain expression of cold in nature will also be able to cure a similar emotional “cold.” In this way, plants can “teach” our emotions as well as our bodies.

Our emotions correspond to our bodily organs. Each emotion has a physical organ which vibrates so to speak, when that emotion is active. When an emotion is blocked, the analogous organ becomes lifeless, and at last, diseased. The plant which corresponds to the affected organ also corresponds to the emotion which animates it. We cannot have our physical health without the emotional health which lies behind it. Plants are embodiments of processes which correspond to both physical and emotional expressions of life. They present complex personalities, thoughts and feeling, as articulate as our own, sometimes, more. They can be our “teachers”, both physically and mentally, and are an ideal means for both education and healing.” (21)

The Doctrine of Signatures can be found in all Ethnobotanical herbal systems, including TCM. There are several legends in TCM regarding how certain herbs found their usages. For instance, Cheryl Schwartz (14) writes of the sour mountain date, (Cornus fruit; Shanzhuyu), begins to flower in Spring and lasts through summer and fall, and the fruit finally becomes ripe in November. The ancients saw that this herb withstands a wide range of temperatures and is productive for so long, that early herbalists felt it could be a longevity herb. It is still used for that purpose today. Morinda root, Bajitian, another longevity herb, is known as “never withering and falling” because it is a persistent hanging vine.

HOW HERBS WORK

Botanical compounds (herbs) have a variety of ways they can effect biological systems. Herbs are complex compounds consisting of amino acids, proteins and peptides, vitamins, minerals, carbohydrates, polysaccharides, fats and oils, as well as a number of biologically active compounds like alkaloids, saponins, sterols, volatile oils and other “phytochemicals”. There are nine classes of these biologically active phytochemicals that will be detailed in the next section.

Herbs create their effects in biological systems from providing nutrients that can influence health, or from providing phytochemicals that have a direct or indirect biological effect on the animal at the cellular level. Often the effects of the herbs on biological systems is the result of the concerted effect of multiple phytochemicals in the herb combined with the nutritive effect of the herb. When a multiple herb formulation is being used, the result response is very complex based on the multiple effects of the multiple constituents of the multiple ingredients in the formulation.

Before modern chemistry was able to define the actual chemicals found in plants, herbal actions were described by qualities of the herb based on its physical properties, taste and its general effect on a biological system. Herbs are described as having taste, temperature, and direction. Thus an herb that tastes bitter, and has a downward direction, could be useful for nausea or vomiting. It is known from practical experience that the bitter taste of an herb stimulates normal gastric emptying, and the downward direction keeps the stomach from “UP” chucking its contents via vomition, and instead moves its contents “downward” which is its normal direction to move digesta. Some herbs are diaphoretic, which means they induce sweating, whereas other herbs are cholegogue, which means they stimulate the contraction of the gall bladder and the release of bile into the duodenum. There are many descriptive names such as these listed in texts of herbal medicine which were used (and still are used) by traditional herbologists.

In modern times, herbal medicine has incorporated the science of pharmacology and pharmacognosy into isolating and describing the active ingredients that make up an herbal medicine, and uses more of an indication-based system of prescribing, versus the Ethnobotanical systems that match the properties of the herbs and herbal formula with the characteristics of the disease pathology and the symptoms of the patient.

PHARMACOGNOSY and PHARMACOLOGY of HERBAL COMPOUNDS

With the establishment of the science of Chemistry, active constituents in herbs were purified, extracted, and ultimately, copied or synthesized, thus giving birth to the science of “pharmacognosy”: “The science dealing with 1) all information concerning medicines from natural sources: Plants, animals and microorganisms, and, 2) the science of synthesizing complex organic compounds with biological activity”.

Modern pharmacognosy recognizes 9 categories of plant-based chemical constituents (Phytochemicals) that mediate the biological effect of plants. (29)

NINE CATEGORIES OF BIOLOGICALLY ACTIVE ORGANIC CHEMICALS
COMMONLY OCCURRING IN NATURAL COMPOUNDS

1. **Complex Polysaccharides**: Starches, gums, pectins. E.g.: Inulin, psyllium.

2. **Glycosides**: Compounds that yield one or more sugars among the products of hydrolysis. Play an important role in the life of the plant; involved in its regulatory, protective and sanitary functions. E.g.: Digitalis, cascara sagrada.

3. **Lipids**: Esters of long chain fatty acids and alcohols, fats, oils and waxes, prostaglandins. Function as food storage for the plant, used as emollients, or for their specific properties such as castor oil.

4. **Terpenoids**: AKA: terpenes. Divided into isoprene (C5H8) units. Monoterpenoids= two units; Sesquiterpenoids= three units, Diterpenoids= four units, Triterpenoids= six units, tetraterpenoids= eight units and are also known as carotenoids. Widely distributed in nature. Found in insect pheromones and defense secretions. E.g.: Vitamin E, Vitamin K, camphor, menthol, thymol, chamomile, valerian, taxol.

5. **Steroids and Sterols**: Any compound containing a cyclopentanoperhydrophenanthrene nucleus. Wide diversity of biological activity: Reproduction, development, anti-inflammatory, anabolic, Vitamin D precursors, cholesterol. E.g.: Cardiac glycosides such as digitalis and oleander, bile acids, wild yam.

6. **Phenylpropanoids**: Non-nitrogen containing phenolic compounds derived from phenylalanine or tyrosine. Also known as plant phenolics. Represented by the flavonoids, lignans, coumarins and tannins. E.g.: Methyl salicylate, salicin, vanillin, proanthocyanidins, milk thistle, rutin, witch hazel.

7. **Alkaloids**: Organic nitrogenous compounds with a limited distribution in nature, not a homogenous group. Have potent physiological effects on mammals. E.g.: Atropine, morphine, quinine, vincristine, ergot, nicotine, goldenseal, ipecac, curare, physostigmine.

8. **Proteins and Peptides**: Enzymes and hormones. E.g.: Papain, bromelain, ficin.

9. **Saponins**: Specialized glycosides that form a soap-like lather when shaken with water. The steroidal saponins mimic the activity of the female sex hormones; the triterpenoid saponins mimic ACTH, immune modulatory, anti-inflammatory activity (30)

SAFETY CONSIDERATIONS

Natural does not necessarily mean safe. For many herbs the difference between effective and toxic is a matter of dosage. Fortunately, except for a few extremely potent plants, the volume of material that needs to be ingested to achieve patient toxicity is usually greater than that which an animal would voluntarily accept. In fact, in most cases, the toxicity is so low that even when administered against the animal’s will, toxicity will not occur.

There always are exceptions and exceptional patients, it is therefore important to continually be vigilant, and consider the potential of toxicity to a specific patient whenever prescribing an herbal formula. In many cases a toxic herb is present only in small amounts as part of a larger formula. Most of the truly effective herbal remedies are made up of combinations of herbs, sometimes as many as 15 or 20 herbs. The actual amount of a single herb ingested thus, is very small. (31)

It is important to be aware that there are species differences with respect to the potential toxicity of plants. Members of the feline species, as a result of their poor Phase II hepatic detoxification enzyme systems are especially sensitive to certain chemicals, such as salicylates.

There are several plants that contain salicylates or salicylate-like molecules in them. The plant concentrations are much less than those found in pharmaceutical aspirin. It would take a lot of effort to force a feline patient to ingest sufficient quantities of salicylate-containing herbs for toxicity to occur. However, in clinical practice it is better to not test this theory.

Avoid the use of salicylate-containing herbs in your feline patients.

Table Of Salicylate-Containing Plants & Trees

<table>
<thead>
<tr>
<th>Aspen (Populus tremuloides)</th>
<th>Birch (Betula alba)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black haw (Viburnum prunifolium)</td>
<td>Lady’s mantle (Alchemilla vulgaris)</td>
</tr>
<tr>
<td>Blue flag (Iris versicolor)</td>
<td>Senega snake root (Polygala senega)</td>
</tr>
</tbody>
</table>
Medicinal plants that have drug-like effects may, understandably, also have undesirable drug-like side-effects. As a result of the lower concentrations of pharmaceutically-active constituents in the plant preparations and the mitigating synergistic effects of the other phytochemicals present in the plant preparations, side-effects from plant preparations are substantially less common than pharmaceutical drug side-effects. However, the German physician and medical herbalist, Rudolf Weiss writes: “phytotherapy is no different (with respect to side-effects) from pharmacotherapy in general: Knowledge (of phytotherapy) alone will prevent failure and ensure success.” (32)

With some patients, however, even the use of the very safe food-like herbs (such as alfalfa or nettles) can be associated with undesirable side-effects. Diarrhea, appetite loss and lethargy are the most usual complaints following ingestion of herbal preparations. Occasionally vomiting or urticaria will also be observed. Usually these reactions are unique to that patient’s experience, and may subside with oral tolerance.

Advise your clients to inform you immediately if any unusual reactions are observed, and recommend that they temporarily discontinue the administration of the herbal preparation to determine if in fact it was the causative agent for the response. If it was the agent, then discontinuing its use will allow the reaction to subside.

If you feel that it is important to continue the use of the herbal preparation for the ultimate benefit of your patient, then recommence its administration at a markedly reduced dosage and/or dosing rate (for example: 25% of the original initial dosage), and gradually increase the amounts administered over a longer period of time, either until the desired effect is achieved, or until the side-effects re-emerge. Your patient may be able to tolerate the last dosage used before the side-effects returned. You can administer this lower dosage over longer periods of time, and still be able to achieve the same results that a higher dosage may have orchestrated over a shorter period of time (but with undesirable side-effects).

**DOSAGES OF WHOLE PLANT REMEDIES.**

Unlike pharmaceuticals which are standardized and fairly singular in their effect, botanical remedies, and some nutritional remedies are not. The potency of herbs is dependent upon the soil conditions they are grown in, the climatic conditions present during the growing season, circumstances regarding the harvesting and storage of the botanical materials, and of course, the methods of processing the crude herb into a medicine. With all of these variables, it should come as no surprise that it can be very difficult to predict the effect of an herb on a patient, thereby making the job of the clinician that much more difficult in establishing an effective level of dosing of a specific herbal formulation.

**ESTIMATION OF DOSAGE**

For the majority of herbs prescribed to the majority of patients, the need for exact herbal dosages is not necessary. There is a broad enough range of safety and effectiveness of herbal preparations for most situations to allow for an estimation of dosage within a range of anticipated therapeutic efficacy. The difficulty in knowing the exact concentration of phytochemicals in an herbal preparation further compounds the difficulty in achieving exact dosages. With the increased availability of standardized extracts and guaranteed potency formulations, greater precision can be achieved in establishing therapeutic dosages for veterinary patients.

Dosages can be found in the scientific literature for many herbal preparations when animal studies are examined for the experimental dosage used in the research. Less common to find are clinical studies that establish therapeutic dosages for veterinary patients (16)

Several veterinary authors have published anecdotal reports of the dosages of herbal preparations they have found to be empirically effective in their clinical practices. (1), (12), (13), (17). A table compiling that data into dosage ranges follows this section. The major difficulty in establishing fixed dosages, in addition to the problems previously mentioned regarding preparation concentration and consistency, is the wide range of species, breeds, sizes, ages and disease conditions that a veterinarian is faced with in day-to-day clinical practice. Any and all of these variables affect the dosage requirements of a patient.

**ESTABLISHING EMPIRICAL DOSAGES**

The rule of thumb that most practicing veterinary medical herbalists use in establishing an empirical dosage is to take the established adult human dosage and prorate the dosage based on a body weight ratio, and then add an additional increment of herbal preparation based on the size of the animal. This is very similar to the way that body surface measurements are used in the estimation of dosages of chemotherapeutic agents. The metabolism of the animal and its body mass interacting with the herbal compound describes the dosing parameters.
There are a number of publications available with the established dosages of herbal preparations for humans (4), (11), (19), (20).

Some veterinary herbalists will start with a slightly higher loading dose of the herbal formulation to improve the response rate of the patient. Once the desired results have been achieved try to titrate the dosage down to a maintenance level. Most herbal formulations have very broad safety margins allowing this technique to be used without any problems.

Other veterinary herbalists will start with a reduced dosage to begin with, especially with very weak and sensitive patients, to allow the herbal compounds and effects to gradually increase. This technique will generally take longer for therapeutic effect, but may be necessary for those patients who react to anything new in their systems.

**ESTABLISHED VETERINARY DOSAGES**

Good quality controlled veterinary clinical studies establishing effective dosages for whole herbal preparations in each breed and species have yet to be completed. The dosages compiled here are the result of the pooled experiences of a number of veterinarians accustomed to the use of herbal remedies in day-to-day practice.

**EMPIRICAL DOSING RANGES FOR VETERINARY PATIENTS**

**Table of Carnivore Dosages**

<table>
<thead>
<tr>
<th>TYPE OF HERBAL PREPARATION</th>
<th>BODY WEIGHT</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-15 pounds</td>
<td>15-35 pounds</td>
<td>35-80 pounds</td>
<td>80+pounds</td>
</tr>
<tr>
<td>Decoction</td>
<td>1-10 mls BID</td>
<td>10-30 mls BID</td>
<td>30-60 mls BID</td>
<td>30-60+ mls BID-TID</td>
</tr>
<tr>
<td>Alcohol Extract</td>
<td>5-10 drops BID</td>
<td>10-20 drops BID</td>
<td>15-30 drops BID</td>
<td>30+ drops BID-TID</td>
</tr>
<tr>
<td>Tablets (500 mg)</td>
<td>1/4-1 tablet BID</td>
<td>1-2 tabs BID</td>
<td>2-3 tabs BID</td>
<td>2-3+ TID</td>
</tr>
<tr>
<td>Pellets (Chinese Patent herbs)</td>
<td>1-2 pills BID</td>
<td>2-4 pills BID</td>
<td>4-6 pills BID</td>
<td>6-8 pills BID-TID</td>
</tr>
<tr>
<td>Capsules (500 mg)</td>
<td>¼ to ½ capsule BID</td>
<td>0.5-1.0 caps BID</td>
<td>1.0-2.0 caps BID</td>
<td>2.0 –3.0+ caps BID-TID</td>
</tr>
<tr>
<td>Extract Granules</td>
<td>1/8-1/4 tsp BID</td>
<td>¼ to ½ tsp BID</td>
<td>½ to 1 tsp BID</td>
<td>1 tsp BID-TID</td>
</tr>
</tbody>
</table>

**Table of Herbivore Dosages (1)**

Frequency of Dosing: 2-3 times daily based on severity of condition

<table>
<thead>
<tr>
<th></th>
<th>Goat (250 lb)</th>
<th>Cow (1500 lb)</th>
<th>Horse (1000 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decoction</td>
<td>4 oz</td>
<td>12 oz</td>
<td>8 oz</td>
</tr>
<tr>
<td>Alcohol Extracts</td>
<td>1 tsp</td>
<td>2 Tblsp</td>
<td>2-3 Tbsp</td>
</tr>
<tr>
<td>Tablets</td>
<td>3-5</td>
<td>10-15</td>
<td>10-15</td>
</tr>
<tr>
<td>Extract Granules</td>
<td>1 tsp</td>
<td>2 Tblsp</td>
<td>2 Tblsp</td>
</tr>
</tbody>
</table>

**ADMINISTRATION TECHNIQUES**

Herbal remedies can be given with food or water, although some formulas are more potent when given between meals. Due to the fact that most herbal formulas will need to be given several times daily for extended periods of time for optimal benefit, it is preferential to make the administration as easy as possible in order to improve client and patient compliance.

Cats are always a challenge to medicate (whether with natural or pharmaceutical medicines), and need to be addressed on a case by case basis. The use of palatability enhancers such as tuna juice, peanut butter, etc. can be used to enhance patient compliance. Sometimes, the use of tablets or capsules, either administered as though
they were pharmaceuticals, or crushed or hidden in food, can improve compliance

**PHARMACEUTICAL EXTRACTS**

*Standardized Extracts*

The manufacturer has taken a specific amount of the active ingredient from the herb, and added it back to the whole herb. This active ingredient is considered to be the constituent responsible for the herb’s action(s).

In some cases the individual active ingredient is sold as the herb itself, without the addition of the whole herb as filler. For instance Silymarin (which is actually a combination of the three flavonoids found in the milk thistle seed Silybum marianum also known as Carduus marianum)) that have been attributed to produce milk thistle’s beneficial effect.

As a result of the physical-chemistry and organic chemistry constraints inherent in pharmaceutical technology, each plant has a different amount of its active ingredient that can be extracted. For instance, Milk Thistle, as mentioned above, standardizes to 70-80% flavonoid content. Boswellia (Boswellia serrata) standardizes to 95% Boswellic acids. Gingko standardizes to contain 24% ginkgo flavone glycosides.

**Guaranteed Potency**

The whole herb is concentrated to a desired level, which ensures that the naturally-occurring proportion of all the constituents in the herb is maintained. Uniform levels of unique phytochemical markers derived from the plants’ biological activity are used to establish the proportions. The numerical ratio found on the product label indicates the degree of concentration of the plant. E.g.: 1:10 Ten parts plant to make one part concentrated product. Many herbalists believe this is the most effective and predictable technique for herb concentration based on the concept that the action of the herb is dependent upon the interaction of its constituents, as well as the actions of each individual component.

**How Pharmaceutical Herbal Extracts Are Used.**

Pharmaceutical herbal extracts are used similarly to their cousins, the pharmaceutical drugs. Specific indications for use are based on basic or applied research, and dosages are derived from research or clinical studies. These herbal extracts have drug like effects. Drug effects include: Anti-inflammatory, anti-microbial, anti-emetic, anti-diarrheal, etc.

One pharmaceutical category that herbal extracts will often find themselves in is as “Biological Response Modifiers” (BRM). This category of drug action orchestrates activity to enhance the stress-response system, immune system or detoxification system function. For instance, returning to silymarin. Studies have demonstrated that this flavonoid complex is capable of improving Phase II liver detoxification enzyme systems. Derivatives of the bark of the Western Larch tree are polysaccharides known as arabinogalactans, which have been demonstrated to improve Natural Killer T cell function in research animals.

Pharmaceutical extracts of herbs may have the ability to reinforce the action of medication the patient may be on. This is not a bad thing, in fact, using herbal supplements may allow a reduction in pharmaceutical drug dosage without a reduction in clinical effectiveness. In fact, most drugs have side-effects along with their primary effects. Licorice root and fatty acids from fish oil (EPA/DHA) can enhance the effect of cortisone, thus requiring a lower dose of glucocorticoid to produce the same effect.

By enhancing their primary effect, we can potentially reduce the drug-induced side-effects by needing less drug dosage to produce the desired effect. Alternatively, herbs can be used to directly reduce drug side-effects. For example, using silymarin along with prednisone, phenobarbital, or carprofen can reduce these medication’s potential toxicity to the liver.

By definition, herbs have effects. Side-effects are the effects not desired in the patient, and main effects are the effects desired for that patient. With some drugs, such as minoxidil (Rogaine™), which was originally a poor quality blood pressure medication, it was found that it had the side-effect of growing hair where it had previously been thinned. Thus this side-effect became a very lucrative main effect.

The veterinary herbal practitioner needs to be aware of these Herb-Drug interactions so as to anticipate the need to reduce pharmaceutical drug dosage as the herbal formula starts to take over some of the drug’s clinical activity.

**HERB-DRUG INTERACTIONS** (from S. Dharmananda: Institute for Traditional Medicine, ITM Online 2003; [http://www.itmonline.org/arts/herbdrug2.htm](http://www.itmonline.org/arts/herbdrug2.htm))

With the increased use of herbs by the general public the concern has been voiced by medical and veterinary practitioners that botanical compounds may interfere with the activity of pharmaceutical compounds resulting in
the failure of therapy, or worse, adverse reactions. This potential for herb-drug interactions is a big concern with modern-day practice of herbal medicine. There have been very few incidents recorded of herb-drug interactions, but when first such reports emerged a decade ago, quite a bit of concern has been raised about their potential. So little is known about herbs and their potential for interaction with drugs. These incidents could be just the "tip of the iceberg." A review the medical literature results in a very small number of reports of adverse interactions. In general, though the issue of herb-drug interactions is one of great concern and the practitioner must be both knowledgeable about potential interactions as well as vigilant for adverse reactions. It is possible that herb-drug interactions may have been responsible for serious life-threatening results.

The nature of herb-drug interaction is not simply a chemical interaction between a drug and an herb component to produce something toxic. Instead, the interaction may involve having an herb component cause either an increase or decrease in the amount of drug in the blood stream. A decrease in the amount of drug could occur by herb components binding up the drug and preventing it from getting into the blood stream from the gastrointestinal tract, or by stimulating the production and activity of enzymes that degrade the drug and prepare it for elimination from the body. An increase in the drug dosage could occur when an herb component aids absorption of the drug, or inhibits the enzymes that break down the drug and prepare it for elimination. A decrease in drug dosage by virtue of an interaction could make the drug ineffective; an increase in drug dosage could make it reach levels that produce side effects. Alternatively, an herb might produce an effect that is contrary to the effect desired for the drug, thereby reducing the drug effect; or, an herb might produce the same kind of effect as the drug and give an increase in the drug effect (without increasing the amount of the drug).

Types of herb-drug interactions of concern are that an herb might:

- Increase or decrease the effect of a blood thinner such as Warfarin and lead to either a bleeding episode or formation of a dangerous clot;
- Decrease the effect of a blood pressure medication, leading to high blood pressure and a stroke;
- Increase the effect of a cardiac drug like digitalis thus leading to digitalis toxicity or cardiac destabilization
- Decrease the effect of an anti-infection agent, letting the infection get out of control; or
- Increase the effect of an anti-diabetes drug and plunge blood sugar to dangerously low levels.

Such responses can occur with drug-drug interactions and with food-drug interactions, so the finding of some instances of herb-drug interaction would not be surprising.

In China it is common for herbs to be combined with drugs. Their combination is sometimes incidental, but is often intentional and based on a prevalent favorable theory about using herbs and drugs. The general sense of the situation among Chinese doctors has been that herbs reduce the side effects of drugs and help them to perform their function better; in turn, drugs will make an herb formula work more strongly and quickly. Together, herbs and drugs may produce a more desirable result than either taken alone. As an outcome of working within this scenario, little attention has been paid to adverse herb-drug interactions.

Human cardiac patients experience no problems in the concurrent use of digitalis and hawthorn berries (Crataegus oxyacantha). Lower doses of digitalis are needed due to a potentiation of its effect when hawthorn is also used. (33) The effects of hawthorn on cardiac performance have been well researched. Animal studies document its positive influence on myocardial metabolism (34).

A good example of these Herb-Drug interactions is the interaction between digoxin and Hawthorn (Crataegus oxyacantha) berry extract (standardized to 3.2% vitexin). Hawthorn is routinely prescribed along with digoxin in Germany where phytotherapy is more mainstream. If you have a patient on digoxin, start by gradually introducing the hawthorn to their program.

Advise the clients to look for early signs of digitalis toxicity, most commonly seen as loss of appetite as the first early sign seen, followed by vomiting. At the first sign that the patient is showing early signs of potential toxicity, begin to wean down the dosage of digoxin. At the same time it is important to evaluate both serum digitalis levels and cardiovascular parameters. This is not a difficult process, and the benefits of hawthorn are many, going far beyond its ability to provide some ionotropic benefits comparable to those of digoxin. Hawthorn also helps to normalize blood pressure and has inherent anti-oxidant properties.

Gingko (Gingko biloba) has demonstrated promising potential for the treatment of cerebro-vascular insufficiency and impaired mental performance. Some geriatric veterinary patients will respond with increased alertness and responsiveness. Part of this activity is due to gingko’s ability to inhibit platelet aggregation and adhesion (35).
There are reports of consumption of gingko associated with bleeding diatheses (36). It would be wise to use caution when prescribing this herb in patients with von Willebrand’s or other coagulopathies.

**HOW TO READ A SUPPLEMENT LABEL TO FIND OUT INFORMATION ABOUT A PRODUCT.**

From the information presented in this paper and from the previous two papers, it should be obvious that not all commercially acquired herbs and herbal formulas are the same. Even with the same information on the label, the actual contents of the formula may vary.

At this point in time there is no over-riding regulatory agency that strictly controls labeling and content in herbal formulas. For herbal formulas that are specifically for people, there is the DSHEA act of 1999 which provides guidelines for standardizing labels. For animals there is no such regulatory overview.

The FDA-CVM had been looking at regulating herbal and nutraceutical supplements for animal use. The NASC (National Animal Supplement Council)’s Scientific Advisory Board and Task Force has reviewed over 900 ingredients that are found in supplements and has developed a grading system to evaluate the potential risk of these supplements in healthy, pregnant and lactating animals of dog, cat and horse species. As a result of the overview by an industry watchdog such as the NASC, the FDA-CVM is allowing the NASC to “self-regulate” the nutraceutical and botanical industry. (www.NASC.org)

Some regulation is good in the marketplace, as companies do not always have the best interests of their customers in mind, or may simply not be knowledgeable of the potential risks associated with herbal compounds.

So how is a practitioner able to sort out the multiple of supplements that are found in the market place? Read on:

**SUPPLEMENT SELECTION GUIDELINES:**

1. Buy from an established company that has been in business long enough that if problems were to have arisen, they would have been dealt with already or the company would have gone out of business.

2. Request from the company certificates of analysis regarding the content of the formula, and testing that has been done to measure the level of toxins, microflora and active herbal components in the formula. These tests cost the company money to run, and will ultimately contribute to the increased cost of the supplement, but the peace of mind, and increased clinical effectiveness are worth the cost. Beware of low cost deals that are too good to be true, they probably are.

3. Be sure that the label contains full disclosure of the contents of the formula, which means that the true weight of each of the components on the formula should be listed specifically; also look for information regarding the amount of standardized herb in the formula. For instance, if a milk thistle formula contains 80% silymarin and the label lists the amount of milk thistle as 100 mg per capsule, standardized to 80% silymarin, then the true content and silymarin potency of the formula is 80 mg of silymarin per capsule. When you are trying to establish an effective dosage it is important that you are giving adequate amount of herb to produce an adequate response.

4. Carefully read the label to see if it contains deceptive information. For instance, some companies will tell you how much of a given substance in the entire bottle or bag of herb, versus on a per dose basis. This makes the formula look more potent than it is and may result in ineffective treatment results.

5. Buy from companies that provide you with technical data and support for the use of their products. Be sure to inform the company of any perceived side-effects from the use of their products. The VBMA has set up an adverse event reporting system on their website. Direct the company to the website if they are not already aware of its existence.

**VETERINARY BOTANICAL MEDICINE ASSOCIATION** (www.VBMA.org)

“The Veterinary Botanical Medicine Association is a group of veterinarians and herbalists dedicated to developing responsible herbal practice by encouraging research and education, strengthening industry relations, keeping herbal tradition alive as a valid information source, and increasing professional acceptance of herbal medicine for animals.

We invite you to use our referral directory to find member vets in your area, and are pleased to offer a library of public information, including links, books, and herbal database and more.

Services include:
- A members-only listserv for daily consultation and education
- Professional certification for notable education and career achievements
- Our inaugural journal - free! More current editions available to members only!
• Discounts on professional continuing education” (From the first paragraph of brochure on website)

RELIABLE INFORMATION WEBSITES
1. www.herbalgram.org
2. www.vbma.org
3. www.herbs.org
4. www.ahg.org
5. www.americanherbalistsguild.com

INDICATIONS FOR NUTRACEUTICALS
INTEGRATIVE PROTOCOLS FOR NUTRACEUTICAL & BOTANICAL THERAPIES

• 4 “R” PROGRAM
Re-establishes integrity of the intestinal barrier mechanism

1. REMOVE Pathogens, antigens, parasites:
   Clostridium
   ▪ Use Amoxi high dose for 5-7 days; reinoculate with high potency probiotic cultures (2 B -10 B CFU/d);
   ▪ Diarrhea Control
      Use Huo Xiang Zheng Qi San to control diarrhea, rice water fast and white rice with baby food until stools are firm
   Giardia
   ▪ Use Pancur for 5 days with high potency probiotic cultures; metronidazole if condition is really severe;
   ▪ Huo Xiang Zheng Qi San; rice water fast; white rice and baby food, rice water.
   Other intestinal bacterial pathogens
   ▪ Treat with appropriate antibiotic and follow similar instructions to address diarrhea with probiotics and herbs and white rice
   Endoparasites
   ▪ Use appropriate anthelmintic
   Antigens
   ▪ Run a food allergy panel with Spectrum labs in order to determine the best hypoallergenic diet

2. REPAIR damaged bowel mucosa
   1 glutamine (Intestamine™)
   ▪ Intestamine™ contains 5 gm glutamine/tsp; N acetyl D glucosamine; Inulin and fructo-oligosaccharides
   ▪ 1/4 teaspoon to 1 teaspoon 2-3 times daily
   ▪ Very safe, sweet tasting amino acid commonly found in meats, dose as high as possible
   ▪ Glutamine provides a source of energy to the intestinal mucosa in the upper GI tract.
   UltraClear Sustain™
   ▪ A medical diet for humans with AOX, rice protein solids, very effective in addressing these problems
   ▪ Dr. Silver has adapted the use of these two powders for these patients. He combines Intestamine™ and UltraClearSustain™ (UCS) 50/50 in the same baggie, and has clients mix 1 tsp to 1 Tablespoon in each meal for improved GI support. This combination alone has successfully treated chronic diarrhea.
   Lecithin granules
   ▪ Supplied in UltraEFA™ or can be found at Health Food Stores as granules
   EPA/DHA
   ▪ Fish oil fatty acids; provide structural components to mucosa and reduces inflammation which promotes healing
   ▪ Dose as much as 15-25 mg EPA/#/day (1 (180 mg EPA)/1000 mg gelcap for each 10 pounds of body weight daily).
   ▪ Need to work up gradually as these animals with chronic diarrhea are sensitive to fats and oils, which can precipitate an episode of diarrhea.

3. REPLACE Essential Digestive Co-Factors
   Digestive Enzymes
   ▪ Vetzymes ¼ - 1 tsp per meal
   ▪ This is a good fungal source of digestive enzymes
- Better than Prozyme (more potent) but Prozyme is OK
- Fungal digestive enzymes function at a wider temperature range and range of pH than plant source enzymes such as papain, bromelain, ficin
- Pancreatic Enzymes ¼ to 1 teaspoon per meal, mixed with food and left at room temperature for 20 minutes before serving to predigest the food and allow the enzymes to better pass through gastric low pH-environment.
- These work best with EPI, otherwise use Fungal Source enzymes

Soluble and Insoluble fiber
- Best provided with fresh wholesome food. Fiber provides a substrate for the growth of probiotic cultures which then produce Short Chain Fatty Acids (SCFA) which are the sole source of nourishment for the mucosa of the lower bowel.
- Sources: Freshly milled flax seed; psyllium fiber; pumpkin; sweet potato; yams; squash

Betaine HCL
- Many animals and humans have impaired gastric acid secretion. Causes include use of H2 blockers and proton pump inhibitors; infection, including Helicobacter pylori; genetic tendencies and dietary influences.
- Hypochlorhydria leads to impaired protein digestion which can be reflected in unthriftiness, poor-doing hair coat, eructation that smells like some is foul and putrid, and possibly soft stools or diarrhea with a similar “something-crawled-up-its-butt-and-died-odor” to the stools or flatulence.
- Supplementing with Betaine HCL (which is a derivative of beet root with pepsin added to improve protein digestion, and also has function as a methylator (trimethylglycine)—which means it aids liver in detoxification))

4. REINOCULATE w/high potency species-specific beneficial bacterial cultures
- RxBiotics™ contains 1 Billion CFU of Lactobacillus acidophilus and 1 Billion CFU of 2 strains of Bifidobacterium sp. In each 1/8 teaspoon scoop.
- Inoculates of 2 Billion to 10 Billion Colony Forming Units (CFU) mixed with the food is usually therapeutic.
- Probiotic cultures are mixed with food to help resist degradation by stomach acid. RxBiotic™ contains specially researched strains of acidophilus that have been specially bred to withstand stomach acid degradation.
- When giving probiotics to counteract or be proactive to help prevent Antibiotic Associated Diarrhea (ASD), concurrent with antibiotics, it is best to give the probiotics during antibiotic therapy, but try to give the cultures at the farthest time period away from administrations of antibiotics. For instance if the dog is receiving a BID dosing schedule, then the probiotics should be given with food in the middle of the day. The client can give one dose of antibiotic in the Am, and then give the probiotic dose when they return home in the evening or late afternoon, and then give the antibiotic at night before bed.

**Allergies**

Inhalent vs Food symptoms: Distribution of lesions; seasonal occurrence; influenced by foods

- Food Allergy Distribution: Chewing Feet, Anal glands, cerumenous otitis (often yeast or staph), epidermal collaretis ventral abdomen = staph dermatitis (cephalexin, staphage lysate hyposensitization, topical antiseptic shampoos)
  - Staph dermatitis/allergy (can determine if allergy with RAST or ELISA IgE serum allergy testing)
  - Often found secondary to food allergy
- Inhalent Allergy distribution: Chewing limbs, flanks, tail head, hips, abdomen

Most dogs have mixed allergies, with either food or Inhalent dominant

Total Antigen Load

- Reduce total number of allergens influencing allergic response
  - Hypoallergenic diet
  - Environmental control—air filters, cleaning feet and haircoat after being outside
  - Others

Evaluate thyroid

- T4 and FT4 will diagnose 85% of all dogs
- MSU Autoantibody panel help if autoimmune thyroiditis
- Commonly under-diagnosed.
- Can be a factor; thyroid influences health of skin as well as immune response

**Food Allergy:**

- Food allergy panel or elimination diet
• Hypoallergenic diet:
  o Homemade diet or commercial diet selection

• Conventional Therapeutics:
  o Antihistamines
  o Glucocorticoids
  o Topical leave-on conditioner with hydrocortisone, diphenhydramine or pramoxine for problem areas such as feet or ears

• Integrative Therapeutics:
  ➢ 4Rs Leaky Gut Protocol
    o Acidophilus/Bifidus high dose 2-20 B CFU/day in food
    o EPA/DHA high dose: 15-20 mg EPA/##/day start gradually and work up
    o L glutamine 500-1500 mg BID in food
    o Lecithin granules or phosphatidylcholine 1 tsp- 1 T/meal or 500-1500 mg PhosChol BID

Inhalent Allergy:

• Conventional Therapeutics
  o Inhalent allergy panel specific for geographical region (Spectrum Labs, Tucson, AZ)
  o Hyposensitization shots
  o Shampoos and medicated conditioners
  o Antihistamines
  o Glucocorticoids
  o Cyclosporin

• Integrative Therapeutics
  o Homemade diet to improve patient vitality and provide food-borne antioxidants and reduce total antigen load
  o Probiotics high potency 2-20 B CFU/day with food
  o EPA/DHA high dose 15-20 mg EPA/day start gradually and work up
  o GLA 240 mg BID
  o ALA: Flax seed, freshly milled or flax seed oil ¼ teaspoon to 1 Tablespoon daily of oil or ¼ teaspoon to 3 Tablespoons daily of freshly milled seed
  o TCM formula: Si Wu Xiao Feng Yin, Zhi Bai Di Huang San, Nu Ke Ba Zhen San (based on patient presentation)
  o Plant sterols and sterolins: Natur-Leaf™ or Moducare™
  o Acupuncture or homeopathy

• Arthritis
  Conventional Diagnostics
    • Radiographs
    • Orthopedic exam and evaluation
    • Gait analysis
    • History

  Conventional Therapeutics
    • NSAIDs
    • Surgery
    • Physical therapy
    • Weight reduction
    • Lifestyle modifications

  Integrative Diagnostics
    • Sensitive acupuncture points (especially for equine)
    • Applied kinesiology

  Integrative Therapeutics
    • Acupuncture
    • Dry needles
    • Laser/Lacer
    • Electroacupuncture
    • Aquapuncture with B12, Procaine or Homotoxicology solutions
    • Moxabustion
    • Chiropractic
    • Massage
    • Homeopathy
• Phototherapy
  • Cold laser
  • Pulsed LED therapy
• Magnetic field therapy
• Nutraceutical and Botanical Therapies
  o EPA/DHA/GLA: High dose (see allergy section for dosing)
  o Antioxidants
    o PCO—proanthocyanidins (grape seed extract; hawthorn; berries in general)
  o Joint lubricants
    • Glucosamine (dose as high as possible 1500 mg -2000mg/day for large dogs)
    • GAG – rich natural foods
      • Bovine cartilage
      • Green Lipped Mussel
      • Sea Cucumber
    • Adequan injections can be given SQ and be performed at home by owner
  o Methylsulfonomethane (MSM)
    • Dose as high as possible—higher doses have better effects
    • 500-5000 mg BID
    • Safe at any dose, very little adverse side effect potential
    • Inexpensive bulk powder most cost-effect therapy for DJD.
    • Works synergistically with GAGs for improved joint mobility
  o Du Huo Ji Sheng Tang
    • AKA: Du Huo and Loranthus
    • Solitary Hermit™ (Mayway pill format 3-8 pills twice daily)
    • Extract granule powder dosage: ¼ to 1 teaspoon twice daily
  o MegaFlex™ and or NutriFlex™ (RxVitamins for Pets)
  o DuraLactin™
  o Boswellia resin 150-500 mg BID-TID
    • MaxiBoz™
  o CTR Support™ Physiologics (Boswelia, ginger, turmeric, Yucca, Devils Claw, Bromelain)
  o Saloxicin™ Zymogen (White Willow Bark and Boswellia and AOX from berries)
8) Acupuncture can help to control symptoms

• Behavior Problems

Conventional therapeutics
  • Obedience training
  • Behavioral modification
  • Thyroid medication if hypothyroid
  • Fluoxetine
  • Clomipramine
  • Amitryptyline
  • Buspirone
  • Diazepam
  • Euthanasia

Integrative therapeutics
  • Phosphatidylcholine 500 – 1500 mg BID
  • Lecithin (1/4 to 1 Tablespoon per meal)
  • DHA (from fish oil or algal sources)
    • 120-1200 mg/day (Dose according to DHA content of fish oil)
  • B complex high potency 15-100 mg of the B’s twice daily
  • Tryptophan 100-500 mg BID-TID
  • Kava Kava 25-100 mg BID
  • Theanine 50 – 150 mg BID
  • Calcium and Magnesium 100-500 mg BID
  • NutriCalm™ RxVitamins (Tryptophan, Kava, Ashwaganda, Valerian, Catnip)
  • TCM-appropriate formulation
    • Jia Wei Xiao Yao San
- **Xiao Yao San**
- **Chai Hu Long Gu Mu Li San**
- **Tian Ma Bu Xin Dan**

**Bladder disease**
1. Measure and balance pH with pH strips and dl methionine, ammonium chloride or potassium citrate
2. Eliminate infection
3. Feed appropriate diet
4. Give Cranberry, EPA/DHA and GAGs regularly
5. Use acidophilus, and increase amount when giving antibiotics
6. TCM formulas
   a. Jia Wei Ba Zheng San (acute or chronic UTI, especially with hematuria)
   b. Zhu Ling Tang (acute or chronic UTI, bland tasting, may improve compliance over Jia Wei Ba Zheng San)
   c. Amber Stone Transforming Formula (Golden Flower Chinese Herbs) to treat stones, crystals and prevent reoccurrence. Dissolves calculi or oxalate or struvite composition
   d. Passwan formula (Chinese patent formula: NuHerbs)

**Oxalate calculi**
Diet that is reduced in oxalate content (green leafy veges);
Commercial diet for oxalates
Supplement with Magnesium and Vitamin B6 which help to dissolve stones
GAGs to improve mucosal health
Cranberry supplements and high dose vitamin C supplementation should be avoided in patients with risk of oxalates
pH test strips for O to use at home to better regulate pH when using UroCit K (potassium citrate for urine alkalinization)
Amber stone relieving formula
Treat underlying UTI by performing a cystocentesis, and culture and sensitivity and then treating for 3 months or more with appropriate antibiotic
Surgical removal of stone and then follow-up with this program

**Chronic Diarrhea**
Fecal examinations. multiple
Food allergy panel
Elimination diet
Diarrhea Management therapies
4 R Program to improve barrier function

**Diarrhea Management Therapies**

**Rice Water Fast for Acute diarrhea and flare-ups of chronic diarrhea**
- Boil 1 cup of white rice (not minute rice!) in 6 cups of water, decant when liquid becomes creamy. Can reboil the rice as many times as needed to produce more rice water.
- Rice water has been recommended by the WHO for use to treat diarrhea in developing nations. It’s mechanism of action is via a peptide released when the rice is boiled that affects the chloride channel in the colon, causing it to re-absorb chloride ions, which carry with them sodium ions and water, which then dries out the stools, thus reducing water loss and diarrhea.

**White Rice Balls and Baby Food Fast for Acute diarrhea and flare-ups of chronic diarrhea**
- Cook white rice (not minute rice) so that it is wet and gooey with 1 cup of rice and 2.5-3.5 cups of water, depending on the altitude you live at.
- Dogs tend to inhale their food, so cooking it this way predigests it for them, and releases more of the rice grain which helps to control the diarrhea. The baby food is used to flavor the rice and add some protein for patient convalescent nutrient needs.
- Fast animal for 24-48 hours, only allowing water, rice water and rice balls with baby food that contain acidophilus, Chinese herbs for diarrhea, Intestamine/UCS powder, antibiotics, etc. The medication is placed inside the rice ball with baby food and given to the dog as a treat. This medicates the dog and also allows for reduced digestive activity at the same time as the dog is provided nutrients.
Intestinal protectants such as bentonite clay, psyllium seed and husk, slippery elm, marshmallow root powder, okra powder can all be helpful to inflamed bowel mucosa.

**Immune Enhancing Agents to give if infectious or inflammatory diarrhea**

Del-Immune-V™ 1-4 capsules daily, do not need to be divided into doses.

**Medical mushrooms**
- Bio-Agaricus™ (100 mg/kg/d)
- AHCC (Immpower™) (1-4 capsules daily)
- Ganoderma lucidum (Reishi/Ling Zhi) (1-6 capsules daily)
- Cordyceps (1-4 capsules daily)

**IP-6 (Inositol hexaphosphate)**
- A form of fiber (phyate) that stimulates natural killer T-cell function
- Dose at ¼ to 1 teaspoon BID can be mixed with food or water

Aloe vera 1:200 concentration or emoden-free liquid aloe vera juice

**Traditional Chinese Herbal Formulas for diarrhea**
- Huo Xiang Zheng Qi San (AKA: Agastache Formula)
  The single most effective herbal formula for diarrhea in the pharmacy.
  Address diarrhea, nausea and vomiting.
  Powdered extract granules (1/4 to 1 teaspoon as often as every 2 hours if diarrhea is really bad, to 2-3 times daily if not so severe.
  Tablets (M&M sized) 1-4 tablets at a time 2-3 times daily or every 2-4 hours if severe.
  Pills (BB sized—good for cats) 1-4 pills at a time, same dosing recommendations as for the first two forms of this medication.
- Pulsatilla Intestinal Formula: Candida, damp heat, bacterial overgrowth (SIBO)
- IBD-2 Formula: Researched formula to treat IBD (Contains Huo Xiang Zheng Qi San)
- Shen Ling Bai Zhu San: Soft yellow stools, often with mucus or blood: ¼ to 1 teaspoon BID

**Cancer**

**History and Examination**
1. Review medical history. How was the cancer detected? Are there other concurrent chronic problems? Acute problems? Previous problems of note? Any sign of arthritis?
2. Review diagnostic work: Has the cancer been diagnosed by histopathology? Is there a Radiograph, Ultrasound or MRI? Has the cancer been staged? Lymph node aspirates? Chest radiographs to check for metastatic disease? Blood tests? Check for thorough thyroid workup. (Auto-thyroiditis test)
3. Diet history; questions regarding appetite, vomiting, thirst. Is the animal sensitive to dietary changes. How are the stools? Is the animal ambulatory?
4. Is the animal on chemotherapy? What agents? What cycle? How has the patient responded to the chemotherapy?
5. Physical examination: Take tongue, pulses; standard exam, body weight, BCS

**Therapeutics**
1. Piroxicam 0.3mg/kg/day (COX2 inhibitor)
2. Cimetadine 200-400 mg BID (British Journal of Cancer, Jan 2002 (86) 161-167; Cancer Res 2000 Jul 15;60(14):3978-84)
3. EPA/DHA 180 mg (EPA)/10#/day (work up slowly)
4. l arginine 500-1000mg 1-2X/day
5. Homemade diet—Cancer diet proportions: 10/50/40 or 00/60/40 (CHO/PRO/VEG) If the animal is sensitive to dietary changes can start with higher amount of carbohydrates in the form of wet-cooked white rice. Raw is best, but not essential. With animals that are immune-compromised may need to start out with cooked food to avoid food-borne enteric infections.
6. Acidophilus/Bifidus: 10-20 Billion CFU per day with food between administrations of Doxycycline
7. Flax seed oil= 1 Tbsp/15 #/day; or 3Tbsp/15#/day (Can use flax seed that is freshly milled. Seed is 30% oil, so use 3X as much seed as oil)
8. Trace mineral formulation: (Mezotrace ¼ 1 tsp BID)
9. Anti-oxidants:
   - Vitamin C;
Vitamin E; 
Selenium; 
Vitamin A&D in Cod Liver Oil (1/4-1 tsp/day)[unless on Marsden Osteosarcoma protocol]

10. CANCER SPECIFIC THERAPIES:
   ONCOSUPPORT™ (RxVitamins’ comprehensive oncology support formula)
   Agaricus blazeii 100 mg/kg
   Del-Immune V™
   Immpower (Beta glucans improve T cell phagocytosis)
   Maitake DVM fraction 10-30 drops SID-BID
   Aloe Vera (reduces angiogenesis)
   IP-6 (induces apoptosis)
   Silymarin
   Green Tea Extract (many anti-neoplastic activities)
   CoQ10 in higher dosages 30-100 mg/day
   Cordyceps/Ganoderma Mushrooms

11. OZONE THERAPY (combined with Orthomolecular Intravenous therapy)
   Intra-rectal Ozone (recommend one treatment every other day for three days each week for four weeks, then monthly after that)
   Subcutaneous Ozone (recommend one treatment every other day for three days each week for four weeks, then monthly after that)
   Intra-lesional Ozone (direct injection of mass with ozone—can be done as often as appropriate to cause tumor necrosis)
   Intravenous Ozone (recommend one treatment every for three days in a row once a month—recommend combine this therapy with Orthomolecular intravenous therapy)

12. ORTHOMOLECULAR INTRAVENOUS THERAPY
   (“Myer’s Cocktail”)
   Mix in a 250 cc bag of fluids or add to 1000 ml NR bag depending upon patient size and administer slowly over 30’ to 90’
   Magnesium chloride (200 mg/ml) 1 ml
   Calcium gluconate (102 mg/ml) 0.5 ml
   B12 (1000 mcg/ml hydrocobalamin) 0.5 ml
   B6 (100 mg/ml) 0.5 ml
   B5 (250 mg/ml) 0.5 ml
   B complex 100 1.0 ml
   Vitamin C (500 mg/ml) 7.0 ml
   MTE-5 0.25 ml (trace element injection)

13. INTRAVENOUS GLUTATHIONE injections

14. SUPPORT FOR THE PATIENT ON CHEMOTHERAPY OR RADIATION:
   Adriamycin™
   CoQ10 30-60 mg/day
   L taurine 1000-3000 mg/day
   L carnitine 500 mg BID
   L glutamine (Intestamine™) ¼ -1 tsp BID
   GI side-effects:
   Intestamine™
   Ginger root for nausea
   Bone marrow side-effects:
   Astragalus and Ligustrum Formula
   Deer Antler 8
   Radiation therapy
   Kelp powder
   Siberian Ginseng (Eleutheroecoccus senticoccosus)
   Ching Wan Hung burn ointment topical or St John’s Wort topical ointment
   Topical glutamine and water for Mucositis or orally for GI side effects of radiation
   Liver support in general:
   HepatoSupport™ (80 mg Silymarin/capsule);
N acetylcysteine 500-1000 mg BID;  
alpha lipoic acid 100 mg BID;  
SAMe 90-400 mg/day;  
Phosphatidylcholine 500-1000 mg BID

15. TCM Herbal formulas to address constitutional issues
Weak digestion:
Ginger root tea  
Ginseng 18 Formula;  
Shen Ling Bai Zhu San;  
Agastache Formula  
Curing Formula.
Qi and Blood deficiencies:
Ginseng and Tang Kuei 10 Formula (Shi Quan Da Bu Tang)  
Sheng Mai San  
Si Ni San  
Nu Ke Ba Zhen San  
Tang Kuei Gin  
Shou Wu Formula

16. ACUPUNCTURE FOR PAIN MANAGEMENT AND IMPROVEMENT OF QUALITY OF LIFE.

17. SPECIFIC CANCER THERAPIES (in addition to the above general cancer therapies):
Osteosarcoma  
Piroxicam 0.3mg/kg/day  
Doxycycline 2.5 mg/kg BID  
Marsden Protocol recommends 5000 IU/# IM q 3 weeks; Vitamin D 750 IU/# IM q 3 weeks  
Modified Hoxsey Formula 1-3 squirts BID  
Ozone and glutathione  
Amputation
Melanoma  
Melatonin 3-12 mg/day (may be helpful with other cancers as well)  
Cordyceps mushroom  
Chai Xiao Hu Tang
Mast Cell tumor  
Quercitin 500-1000 mg BID  
Ganoderma mushroom (Reishi or Ling Zhi)  
Grape Seed extract (PCO) 2 mg/# BID  
Green Tea Extract 500 mg BID  
Xue Fu Zhu Yu Tang (100g) w/ E Zhu (10 g) and San Leng (10 g)
Lung Cancer  
Quercitin/Bromelain  
Cordyceps Mushroom  
Astragalus and Ganoderma mushroom  
Tylophora Plus or Bu Fei Wan, or Lily Preserve Metal  
Appropriate antibiotics and anti-tussives if needed.
Bladder or Prostate Cancer with TCC  
Piroxicam 0.3 mg/kg/day qd  
Shao Fu Zhu Yu Tang

•Epilepsy (and neurodegenerative disease)
History and Examination
1. Review medical history regarding onset of seizures and any linked events such as vaccinations, Proheart injection, diet change, household or environmental exposure to toxins, etc.
2. Review diagnostic work: Blood tests, Phenobarbital and KBR levels, Imaging. Check for thorough thyroid workup. (Auto-thyroiditis evaluation)
4. Physical examination: Take tongue, pulses; standard exam, BCS
5. Diet History; Activity History; Major medical or surgical history; trauma history.
6. Personality; relationships within household with animals, people. Changes in schedule of people in
Therapeutics
1. taurine 500-2000 mg BID
2. Phosphatidylcholine 500 mg 1-2 SID-BID
3. EPA/DHA 180 mg (EPA)/10#/day (work up slowly)
4. Homemade diet-hypoallergenic if history indicates; use a 33/33/33 proportion to start. If evidence of protein-handling difficulties, then increase CHO to 50% and reduce PRO to 25%; if evidence of CHO handling difficulties then do the reverse alteration in percentages
5. Flax seed oil = 1 tsp/15#/day; or 1Tbsp/15#/day
6. B complex stress formulation (Megapet Daily™ -1 cap BID)
7. Trace mineral formulation: (Mezotrace™ ¼-1 tsp BID)
8. Antioxidants: Vitamin C; Vitamin E; Selenium; Vitamin A&D in Cod Liver Oil (1/4-1 tsp/day)
9. TCM Herbal formulas that have helped: Gastrodia Relieve Wind -3 tablets BID is good for deficiency seizures (older, deficient kidney, blood, Qi-but this formula has helped frequently regardless of patient presentation-a good general formula to use); Ding Xian Wan is an expensive but effective formulation for juvenile epilepsy and seems to be particularly effective for those patients with "Brain Phlegm-Fog" which manifests as a prolonged seizure time and a prolonged post-ictal phase.
10. Ayurvedic Herbal formulas that can help should include Ashwaganda and/or Bacopa 1-3 caps BID.
11. Acupuncture; and gold bead implantation.

Concurrent Medication
1. Do not take the animal off of its seizure medication, especially if it is still having breakthrough seizures!!!!!
2. The protocol is to put them of this protocol and remain on the medication for at least 2-3 months, then re-measure Phenobarbital and KBR levels, and adjust one of them down by 10-25% (Phenobarbital is usually the preferred medication to begin titrating down) Work slowly and methodically in reducing these dosages and giving the animal enough time to demonstrate that it is not precipitating more seizure activity. Some animals only have breakthrough seizures once or twice a month or two.
3. If the animal is having seizures at a higher than desired frequency, then initiating anti-convulsive therapy or adding KBR or Phenobarbital to the anti-convulsive therapy is a good idea, unless the client is adamantly opposed to it.

•Inflammatory Bowel Disease
Historical Information of Importance
   Eosinophilic is most likely food allergy, while lymph/plasma most likely is chronic inflammation
2. Foods fed?
   Responses? Dry/canned/homemade?
3. Consider food allergy panel or Total Allergy panel
4. Diarrhea/painful defecation?
   Diarrhea Management Therapy
5. Remember make very gradual changes!!

Therapeutics:
1. 4 R Program with 50/50 Intestamine™/Ultra Clear Sustain™ and UltraEFA™
2. Keep on medications if already on them, if not, may want to try pred or budesonide
3. White rice, pumpkin, Yams, Sweet potato, squash unsweetened shredded coconut
   (MCTs help nourish bowel wall)
4. Home made diet introduced gradually
5. Chinese herbal formulas:
   IBD 2 (has Agastache in it)
   Shen Ling Bai Zhu San
   Huo Xiang Zheng Qi San;
6. Diarrhea Management Therapy

•Kidney Disease
Conventional diagnostics
Cr/BUN/UA C&S: Treat with ABx if indicated
Blood pressure
UPC
Ultrasound
Biopsy?

**Conventional Medications:**
Benezepril
Amlopidine if indicated
Phosphate binders if needed:
Epaktin: 1 gm/10#/meal (1 scoop = 1 gm)
Aluminum hydroxide
Potassium supplements if needed

**Home made diet:**
Percent protein depends upon the degree of azotemia
- 33/33/3 marginal azotemia
- 50/25/25 azotemia
- 60-75%/15-20%/remainder veggies for severe azotemia

**Complementary Supplements:**
B Complex (Mega Pet Daily)
1/4 cap for cats BID and 1 cap BID for biggies
EPA/DHA (180 mg EPA/10#/day)
Probiotics (High potency formulation)
AOX:
- vitamin C 250 - 500 mg BID
- Vitamin E 200 - 400 IU
- Selenium 25-200 mcg/day

Feline or Canine Renal Support (Standard Process glandular product)
Core Level Kidney (NutriWest glandular product)
Hawthorn berry (tablets 1-3 BID); extract granules 1/4 tsp to 1 teaspoon BID
Gingko 1-2 mg/#BID
Kidney Yin deficiency (signs of heat, dryness, copious thirst, concentrated urine or oliguria)
Liu Wei Di Huang San (Six Flavor Tea Pills)
1/4 teaspoon - 1 teaspoon BID; 1-3 pills BID
Kidney Yang Deficiency (cold, moist)
Jin Gu Shen Qi San;
Recheck frequency based on severity of clinical signs:
2 weeks redo bloodwork

**•Glomerulonephritis**

**Diagnostics:**
1) Urine Prot/Creat Ratio
2) Chem12/CBC
3) Blood Pressure
4) Abdominal Ultrasound
5) Abdominal and thoracic radiographs
6) Renal Biopsy (+/-)?

**Therapeutics:**

**Conventional--**
1) Ace inhibitor (Benazepril)
2) Blood pressure medicine if Benezepril insufficient (Amlopidine)
3) Moderate protein restriction using source of high BV protein (eggs, dairy, poultry, fish)
4) Hyperphosphatemia control
5) Fluids SQ or IV as needed
6) Baby aspirin to reduce thrombolytic possibilities

**Therapeutics:**

**Integrative--**
1) EPA/DHA 18 - 36 mg/#/d
2) GLA 150 - 480 mg/d
3) vitamin E (mixed tocopherols) high dose 400-1200 IU/d
4) selenium 50 - 200 mcg/d  
5) vitamin C 250-1000 mg BID  
6) PCO 2mg/# BID  
7) Green tea extract 500-1000 mg BID  
8) N acetyl cysteine 500 mg BID  
9) B complex 50 - 100 mg BID  
10) Core Level Kidney (glandulars and organ-specific nutrients) 1 BID for a large dog (NutriWest, Douglas, WY)  

Address Increased Intestinal Permeability (see Leaky Gut material)  
Home Made Diet using moderate protein restriction with high BV protein; eggs, dairy (lo salt) chicken, lamb or calves liver, aduki beans, watercress, parsley  
50/25/25; 2 cups/25#/d divided BID;  
1) l glutamine 1000-2000 mg BID  
2) lecithin 1/2 - 2 teaspoons BID  
3) l arginine 500 mg BID  
4) Active probiotic cultures (L acidophilus/L bifidus) 5-20 B CFU/d  
5) Flax seed meal: 1 teaspoon - 3 T/day  

Platelet Aggregation Inhibitors And Capillary Flow Enhancers  
1) Gingko biloba 2 mg/# BID  
2) Hawthorn berry 100 mg BID (Formula CV is good, also has DMG in it--1-2 caps BID)  

Immune-Modulating Herbs  
1) NatureLeaf™ plant sterol and sterolin formula 1-4 capsules daily  
2) Agaricus Bio ™ concentrated medicinal mushroom (Atlas World) 100 mg/kg/day  
4) CoQ10 30 mg BID  
5) Cordyceps chinensis medicinal mushroom (organ specific for kidney and lung) 500 mg BID  

Intravenous Orthomolecular Therapy  
1) Start out once or twice weekly 2-3 times then do monthly outpatient IV therapy with high fluid rate (30 ml/#/hour) and Meyer's Cocktail with high doses of vitamin C 20-30 grams/d  
2) IV glutathione 500-1000 mg IV/day  

Intravenous Ozone Therapy  
Pyelonephritis, chronic and acute UTI, especially if ozonated saline can flush bladder multiple times  

Homotoxicology/AP  
1) Autosanguis monthly; #1: Starting with Traumeel/Solidago/Tonsilla/CoEnzyme&Ubichinon (Rx: Reneel&Apis&Autosanguis); #2 Add Glyoxal to above autosanguis as the last phase. Inject points such as LU7/K16; BL23; CV4/12; K17; ST36/ST40; GV14; GV20 GV3.; #3 Other remedies to consider include Lymphomyosot/Galium alternating days orally, Apis (good for inflammation along with traumeel) May want to start with these to get the detoxification started: Berberis/Lymphomyosot/Nux vomica for detoxification; Engystol if viral etiology. If fever or ancillary symptoms occur following treatment, do not suppress symptoms with febrifuges or antibiotics.  
2) AP weekly: Based on tongue and pulse and signs and symptoms  

TCM/Ayurvedic Herbs  
1. Rentone  
2. TCM herbal formulas (1/4 teaspoon to 1 teaspoon BID or 1-5 pellets or tablets 2-3 times daily)  
   a. Liu We Di Huang San for concentrated Urine Specific Gravity  
   b. Jin Gu Shen Qi San for dilute Urine Specific Gravity  
   c. Zhi Bai Di Huang San for excessive thirst and dryness of haircoat  

•Liver Disease  
•Hepatitis Protocol  
Abdominal US with biopsy is best way to diagnose and treat liver disease  
4Rs Program (Everything from the bowel goes to liver first. Need to address Leaky Gut, and minimize work liver needs to do.)  
HepatoSupport (10 mg/#/day or higher) 1-3 capsules 1-3 times daily. Higher doses improve response. Only downside is possible soft stools or diarrhea.  
N Acetyl cysteine 500 mg 1-3 times daily  
Phosphatidylcholine 500 mg 1-3 times daily; can use lecithin granules or liquid lecithin (as found in
UltraEFA
Alpha lipoic acid 100 mg 1-3 BID
SAMe 200-600 mg BID
Ursodiol 300mg 1/4-1 capsule SID-BID
Nutripro(tm)
Digestive enzymes (Vetzyme) fungal source
zinc 5-30 mg 1-2 times daily (especially with copper deposition disease)
vit E (1:1 alpha to gamma formula 400-1200 IU/d
vitamin c 250-500 mg BID
selenium 25-200 mcg/d
RxBiotic
Liver friendly home made diet
Eliminate pharmaceuticals as much as possible that may be affecting liver
B complex (MegaPet Daily 1/4 capsule to 1 capsule BID)
EPA/DHA 1 gelcap/10#/day
Ji Gu Cao or Livit 2 (Ethnobotanical formulas for hepatitis)
Li Dan Pi Shi Wan 2 pills BID (dissolves gallstones, thins bile
Acupuncture

• Hepatic Lipidosis Protocol
FEEDING TUBE:
ET tube 18 - 20 french
FEEDING INSTRUCTIONS:
Total Calorie intake = 28 - 36 kcal/#/d
If canned food (average calories = 600 kcal) is diluted 1:1 to get through catheter it contains about 0.75 kcal/ml. If canned food is diluted 1:2 (water:food) then it would contain 1.0 kcal/ml.
Do not restrict protein unless signs of hepatic encephalopathy such as ptalism. Initially start feeding at 1/2 the calculated amount needed for the first 24-48 hours of feeding. The calculated daily requirement is divided in to 4 to 6 feedings per day initially. As cat can tolerate more, can reduce the number of feeding to 3-4 per day.
Administer a volume each time that does not exceed 14 ml/#/feeding.

ANTI-EMETICS:
Metoclopramide given at dose of 2.5 to 5 mg 30 minutes before feeding, given through feeding tube.
Ranitidine 3.5 mg/kg BID PO (in cats only; dogs use famotidine)
Famotidine 5-20 mg/day

DIETARY SUPPLEMENTS:
1 carnitine 500 - 1000 mg/day divided into 4 feedings (250 mg/feeding)
1 taurine 1500 mg BID (1/4 teaspoon = 1500 mg)
Silymarin 80 mg TID (1 capsule of HepatoSupport)
B complex 25 mg QID (1/4 capsule of MegaPet Daily) (Also put 3 cc B complex/1L fluids)
Phosphatidylcholine 500 mg BID
Vitamin C in fluids after hydrated (250 mg/100 ml)
1 glutamine (Intestamine) 1000mg QID (1/4 teaspoon)
1 arginine 700 mg/day
Acidophilus 2 Billion CFU/d (1/8 teaspoon daily of RxBiotic)

PROGNOSIS:
Spontaneous recovery is rare. with tube feeding recovery rates of 80-90% depending upon how stable the cat is at time of presentation, the aggressiveness of force-feeding, and the ability to control vomiting. The earlier the cat is treated the better the recovery rate. Force-feeding may need to be as long as 3-12 weeks. Once there is normalization of biochemical parameters, tube feeding is gradually reduced and the cat should be coaxed to eat on its own. Once it is eating on its own without any tube feedings for 1-2 weeks, the tube is pulled.

• Liver-Specific Nutritional, Botanical and Nutraceutical Therapies
Naringenin: A flavonoid found in grapefruit juice, down-regulates Cytochrome P450 activity. Recommended for transplant patients to drink an 8 oz glass a day to reduce rate of detoxification of cyclosporin.
Glucosinolates: Phytochemicals found in cruciferous vegetables such as broccoli, cauliflower, Brussels sprouts, cabbage, found to influence first pass detoxification of a variety of chemicals. Garden cress, another glucosinolate-containing food, has been found to increase glucuronidation processes, (21) as well as to provide balancing effects on Phase I to Phase II detoxification.

Fiber from certain dietary sources has been found to influence the activity of a Phase II enzyme, UDP-glucuronosyltransferase. In examining wheat bran, carrot, cocoa and oat bran fibers it was found that cocoa fiber influenced phase II UDP glucuronosyltransferase activity more than wheat or carrot fiber. This suggests that colonic bacteria also play an important role in modulating glucuronidation, as well as a probable direct effect of fiber on detoxification systems.

Milk Thistle: Contains the flavonoid complex, silymarin which has been shown to influence both P450 and UDP glucuronosyltransferase activity. Supports balanced Phase I to Phase II detoxification. Anti-oxidant, reduces hepatic oxidative stress. Milk Thistle also helps to protect the liver from damage from toxins. (23) It has also shown the ability to stimulate hepatic regeneration. (24)

Phase I or Phase II Inducers—Monofunctional Modulators: N acetyl cysteine (hepatic glutathione inducer); selenomethionine (hepatic glutathione inducer); Phosphatidylcholine; folic acid; vitamin B12; riboflavin; niacin; B6—(all involved in hepatic methylation reactions); vitamin A (affects phase II UDP glucuronosyltransferase); l-taurine (auxilizes in formation of bile, promotes taurine phase II conjugation); l-glycine (glycine conjugation); l-glutamine (stimulates hepatic and intestinal glutathione levels, important role in hepatic ammonia detoxification, and regulation of hepatic pH.; plays a complex role in liver metabolism and transport mechanisms via its role in cellular signaling and gene expression. (25))

Phase I and Phase II Balancers—Bifunctional Modulators: watercress phenylisothiocyanates; pomegranate polyphenols (ellagic acid); green tea catechins and polyphenols (specifically EGCG: epigallocatechin gallate, has been shown to reduce excessive activity of cytochrome P450 while up-regulating the activity of phase II systems, and thus reducing hepatic oxidative stress; this explains the measured ability of green tea to reduce the potential toxicity of many xenobiotics); silymarin.

CoFactors for Hepatic Detoxification and Anti-oxidant Activity: Vitamin E; zinc; magnesium; molybdenum; manganese; copper; mixed carotenoids. (22)

**Pancreatitis: Acute and Chronic Therapeutic Choices**

**NPO**
- IV fluids to rehydrate
- Monitor serum albumen, electrolytes, CBC, Lipase or pSPEC test from Texas A&M (through Idexx™ Labs)

**Antibiotics**
- 1. Fluoroquinolones are good initial ABX for the pancreas
- 2. Ampicillin combined with Baytril gives good spectrum of activity
- 3. Metronidazole IV if anaerobic infection is dominant

**Metoclopramide 0.2 mg/kg SQ, IM, IV BID-TID**

**Famotidine 0.5mg/kg IV BID**

**Pain management:**
- Torbugesic; buprenorphine; Metacam; Acupuncture

**IV antioxidants:**
- Selenium 10 mcg/kg x 3days then 5 mcg daily + (PO: 25 -200 mcg/d for preventative maintenance dose)
- Vit C 30 mg/kg
- NAC 70 mg/kg IV
- Glutathione 500-2000 mg/d intravenously while hospitalized and NPO until better
- B-complex 5ml/100#
- Cobalamin (B12) 1000mcg once a week x 6 wks, q 2 wks x 6 wks, then q 1 month

**Oral Management of Pancreatitis Acute/Chronic**
- Start on pancreatic enzymes with each meal once animal is eating OK
- Add liver support using HepatoSupport Formula
- Bland homemade diet is the best; Send home instructions and or samples.

**SUPPLEMENTS TO SEND PANCREATITIS PATIENTS HOME ON:**
- Have them feed a bland diet consisting of wet cooked white rice (not minute rice) and chicken or turkey baby food or roasted chicken or turkey (unless animal is allergic, then use fish or lean beef) in small amounts frequently to start to adapt animal to food. 1 Tablespoon of rice and 1 teaspoon of meat (1:3 ratio)
- N Acetylcysteine 500 mg BID to TID
Vitamin E 400 IU mixed tocopherols or d alpha tocopherol QD-BID
Selenium 25- 200 mcg/day
Vitamin C (Bio C) 1 scoop or 500 mg BID

TCM herbal formula: Major Bupleurum--comes as a powder for dogs that eat anything and as a pill for cats and picky dogs. Dose 1/4 to 1 teaspoon BID of powder or 2-5 pills twice daily of the pills.

Digestive Enzymes: Non-pancreatic source = Vetzyme™’s 1/4 to 1 teaspoon per meal; Pancreatic enzymes (for dogs with EPI or borderline EPI) 1/4 to 1 teaspoon mixed in food and left at room temperature for 20 minutes to pre-digest, before serving.

Probiotics: RxBiotic™ 2-10 B CFU/day
Intestamine™/UltraClear Sustain™ mixture 50/50 1/4 teaspoon to 1 Tablespoon (give them as much as they will tolerate) mixed with each meal.
Recheck Lipase and pancreatic values (pLI?) as appropriate to case management

•Stomatitis

PROTOCOL:
Home made hypoallergenic diet low in CHO's or Hypoallergenic canned food--avoid dry food
Continue on pred and taper dose after a month on the program--it may be too soon at that time to taper, but its worth a try.
CoQ10 30 mg/day
Vitamin E 400 IU./day
Selenium 25 mcg/day
Vitamin C 100-250 mg BID
Grape Seed Extract (PCO’s): 20 mg BID
Lactoferrin 250 mg BID; or Nutricillin (also contains Olive leaf extract) 1 BID

Dental prophyl (extractions if needed--be aggressive)
Pulsed anti-biotic therapy: (C&S of oral flora is best) Metronidazole; Baytril; Clavamox; Clindamycin
Rocket Fuel: Doxycycline/Niacinamide
Acidophlius 1-5 B CFU/meal
EPA/DHA/GLA : 180mg/120mg/100mg BID
CoQ10 10-30 mg/d for a cat
Boswellia as an anti-inflammatory

•Trauma and wound healing

Tieh Tah Formula (Martial arts formula speeds up healing following trauma--especially good for tendons, ligaments and bone) 1/2 - 3 tablets twice daily
Jin Gu Die Shang Wan comes in smaller pills for small dogs and cats (1-3 pills 2 times daily)
Have animal take 1-2 bottles’ worth to address trauma.
Arnica montana 30C immediately post-trauma three times daily
Ice to injury for first 24 hours then warm compresses after that for the next week or so.
Saloxicin™ with Boswellia for pain 1-3 capsules 2-3 times daily or as needed for pain
CTR Support™ is also good for pain, also contains boswellia
MSM: give as high a dose as animal will tolerate. Powder 1/4 -1 teaspoon 2-3 times daily; 500-4000 mg BID-TID
Cytozyme trachea™ 4-6 capsules daily. Takes 3-4 weeks to build up in the system. Provides GAGs and cartilage tissue factors that are needed for repair and joint lubrication. I recommend this instead of glucosamine sulfate or HCL.
FlexNGo™ can also be used for this: It is made from green lipped mussel (like Glycoflex only better quality and higher potency) 1/2 - 3 capsules 1-2 times daily
ACUPUNCTURE if severe several times weekly to start or if not severely affected, once weekly for 3-6 treatments
Collagenics™-support for cartilage and connective tissue, good pre and post ACL injury or Sx
Yunnan Bai Yao™ speeds wound healing and moves blood stagnation, can be used peri operatively to reduce intra operative hemorrhage
Fractures: Homeopathic Comfrey Symphytum 30C
EPA/DHA; ALA from flax seed oil
Osteogenics™ calcium supplement for non healing bone injuries

RESOURCE LISTS

PRODUCTS:
2. BHI-HEEL Inc.: 800 621 7644  www.heelusa.com (Professional supplier of combination homeopathic tablets, gels ointments and injectables)


4. Herb Pharm: 800 348 4372  www.herb-pharm.com (Good quality herbal supplier; glycerites, ethical harvesting; professional)

5. Institute for Traditional Medicine (ITM), Portland OR,  www.itmonline.org (503) 233-4907


8. Mountain States Health Products (MHP): 800 MHP 0074  www.mhpvitamins.com (Distributor of many different brands of nutraceuticals and botanicals; veterinary friendly; O is client of author’s)


10. NutriWest: 800 443 3333 (combination glandulars and nutraceutical products)  www.nutriwest.com

11. Pharmax LLC: 800 538 8274 (great company, author gets personal nutritional supplies from them, tasteless fish oil, high potency acidophilus cultures)  www.pharmaxllc.com

12. Physiologics:  http://www.physiologics.com (supplier of nutraceuticals used by author)


14. RxVitamins for Pets: 800 RX 2 2222;  www.naturaldvm.com (the author’s formulations)

15. Terrance International Distributors (TID): 800 824 2434  www.TIDhealth.com (Distributor of many different brands of nutraceuticals and botanicals. One stop shopping. Professional company)

16. The Key Company: 800 325 9592 (Vitamins, Fatty acids, nutraceuticals, glandulars; professional company only sells to DVMs and MDs)  www.thekeycompany.com

17. Thorne Veterinary:  www.Thorne.com

GENERAL REFERENCES:


3. Chinese Veterinary Herbal Medicine Xie;  www.tcvm.com


   Silver has a chapter in this book on Ayurvedic veterinary medicine.


WEBSITES and ASSOCIATIONS:

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