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Abstract
A female dog without physical complaints has shown depressed behavior for years. This dog responded within a few weeks to a Chinese herbal formula, Xiao Yao San, without any other modification in lifestyle or diet. The behavior has continued to improve without relapse or noticeable side effects.

CASE PRESENTATION
Yucca is a Jack Russell Terrier, 9 years old. She is a sterilized female. Her bodyweight is 6 kg, her body condition is normal.

On 15 December 2010, Yucca was presented. The owner felt her dog was depressed and had been so for 8 years. Normal dog behavior is lacking. The dog shows no interest in other dogs, or humans, not even the owners. There is no display of affection towards any individual. The dog shows no interest in interaction of any kind. Yucca has been well socialized as a pup, attending puppy classes and displaying normal social interactive behavior. The problem started when, at the age of one year, the son of the owner took the dog with him on an internship. Even though she could be with him all day, her behavior started to change and she became more and more reclusive. On returning home she never fully regained her previous demeanor. The only thing Yucca is interested in is squeaky toys. Yucca avoids anybody who is obviously sad or very happy. She will not try to comfort a sad person. Anyone enticing her to play is also ignored. She never plays with other dogs. She accepts the other dog in the household, but does not seek contact with it. She gathers items in her basket: mobile phones, lighters, shoes, pens, anything she can get a hold of. There are no signs of aggression and she is timid. There is no edge to her behavior. Yucca had pups once, was a good mother but she did not seem to enjoy it at all. She has a two year history of gastrointestinal (GI) disease, with abdominal pain, bouts of loose stools but no vomiting. There is no mucous in the loose stools, nor is it extremely smelly. She has been examined multiple times by different veterinarians, but no causative agent was identified and diarrhea resolved with aluminium hydrochloride, or without conventional treatment, only to reoccur a month later. She has been fed a commercial balanced blend of meat and vegetables for the past 18 months, previously she was on a commercial dry dog food. The change of diet has improved the GI problems but not completely resolved them. Besides this, Yucca had no health issues in the past.

Yucca had been overweight a few years ago, at 8 kg, and was on commercial dry dog food at the time. At the time of presentation she was in normal body condition. She has always been a picky eater. Blood cell counts and chemistry profiles have been done on several occasions including T4 and TSH and showed no abnormalities. There seems to be no physical cause to explain Yucca’s lack of joy in life. No medication was prescribed.

Traditional Chinese Medicine Examination
Tongue is lavender and slightly swollen, consistent with Blood deficiency and Qi stagnation and/or Dampness. Pulse is very tense and narrow, normal rate. Active point is Bladder 18 with radiant heat and pressure sensitivity. Needling, with even method, Liver 3 markedly improved the pulse, making it less tense, confirming Liver Qi stagnation is the pattern here.

Traditional Chinese Medicine Diagnosis & Prescription
Qi stagnation with mild Dampness signs and Blood deficiency. The Liver is overacting on Spleen causing GI issues, manifesting as loose stools and abdominal pain. Treatment goals are to move Liver...
Qi and tonify Blood, drain mild Dampness. Tonifying Liver Blood and moving Liver Qi will prevent the Liver from overacting on the Spleen causing GI symptoms. Xiao Yao San, also known as Rambling Ease Powder or Free and Easy Wanderer Powder, was prescribed at a dose of 75 mg/kg. It treats Liver Blood deficiency, Qi stagnation and drains a little Dampness if present. Xiao Yao San is an appropriate formula for both irritable bowel syndrome (IBS) and clinical depression, making it appropriate in this case due to GI issues. Xiao Yao San is a harmonizing formula: Bupleurum moves stagnant Liver Qi, Dang Gui and Bai Shao tonify Blood and Yin, Mint clears Heat, Atractylodes, Poria and Licorice support the Spleen and drain Damp.

**Advice about Exercise, Diet & Additional Supplements**

Yucca gets plenty of exercise, but shows no interest in other dogs or humans. The owners were advised to give her time and respect the fact that she wants to be left alone but still invite her, as much as possible, to interact with them, or other dogs. If squeaky toys are the only thing that give her joy, try to put up with the noise and let her have that joy at least.

**Outcome**

Within two weeks of taking the Xiao Yao San, Yucca’s behavior started to change. She started to show more self-initiated movement and became more interested in what was happening around her. She started to brings toys to people in the household and invite them to play with her. She started to actively seek attention from the owners and would respond with tail wagging when spoken to. She climbed on the sofa at night and cuddled up against the owners, wanting to be caressed. Outdoors she still freezes when other dogs approach her. Her behavior has continued to improve over the last 3 months, she is a playful dog now, who wants to be caressed. This behavior, normal for most dogs, was something she had not displayed for 8 years. She is keener to go on walks, but still does not seek much interaction with other dogs.

Follow up was on 30 December 2010, 9 January 2011 and 17 February 2011. She has had no further GI issues since she started the herbal medication. Her tongue is less swollen but still a bit lavender. Her pulse is softer but still has a slightly tense feel.

**Discussion on diet change**

It would be expected that Yucca would improve on a fresh meat diet, since protein deficiency can give rise to decreased serotonin levels in the central nervous system which can be an important factor in depressed behavior. However, increasing the protein in her diet did not make any difference according to the owner.

**Discussion on the single herbs in Xiao Yao San**

*Radix bupleuri* - Chai Hu was found the have an anxiolytic-like effect and to reduce stress induced alteration in learning and memory behavioral tests in rats. It significantly reduced stress induced loss of choleteric immunoreactivity in the hippocampus (Lee B, Shim I, Lee H, Hahm DH, 2009).

A combination of *Scutellaria baicalensis* and *Bupleurum scorzinerifolium* showed neuroprotective effects on iron-induced neurodegeneration in the nigrostratial dopaminergic system of rats (Lin AM et al, 2011). The expression of glutamate and especially GABA increases in chronic pentetrazole-induced kindling in the rat hippocampus. Saikosaponins, the main active ingredients of *Radix bupleuri*, were shown to inhibit these increases and to contain glutamate and GABA expressions within normal range. There was no significant difference between the Saikosaponin group and the sodium valproate group (Xie W, Li CZ, Bao Y, Yu LJ, 2006).

*Radix peoniae alba* - Bai Shao. The total glycosides of Peony alleviate depression, induced by chronic unpredictable stress. The antidepressant activity is probably mediated by inhibition of monoamine oxidases and the attenuation of oxidative stress in the mouse brain (Mao QQ et al, 2009). The same author also states that neuroprotective effects could be one of the active mechanisms of antidepressants. Peoniflorin, a chief active ingredient of Bai Shao, was found to exert a neuroprotective effect on...
glutamate-induced neurotoxicity in rat pheochromocytoma cells via inhibiting oxidative stress and Ca\(^{2+}\) overload (Mao QQ et al, 2010). Peoniflorin was also shown to have antinociceptive effect in rats by using bee venom. This effect was reversible with naloxone, suggesting it is mediated through endogenous opioid receptors (Yu JY et al, 2007). Peoniflorin has an analgesic effect in colorectal distension-induced visceral pain in rats with visceral hyperalgesia induced by neonatal maternal separation. The analgesic effect is possibly mediated by the adenosine A(1) receptor in the laminae I-II in the lumbosacral dorsal horn, as well as in the anterior cingulate cortex (Zhang XJ et al, 2009). Peony root was shown to have a significant antagonizing effect in scopolamine-induced memory impairment in rats. Peoniflorin, at a dose of 0.01-1 mg/kg, dose-dependently attenuated scopolamine-induced memory impairment, suggesting this may be the active ingredient responsible for the effect of peony root. Pretreatment with peoniflorin significantly prevented the scopolamine-induced decrease in acetylcholine content in the striatum, but not in the hippocampus or cortex. The decrease of acetylcholine in the striatum, cortex and hippocampus is the mechanism through which scopolamine is believed to exert its disruption of working memory (Ohta H et al, 1993).

*Radix angelicae sinensis* - Dang Gui contains several compounds with affinity towards serotonin receptor (5-HT(7)) in a competitive binding assay. These were identified as Z-butyldieneptalide, 11(S),16(R)-dihydroxoyctadeca-9Z,17diene-12,14-diy-1-yl acetate, (3R,8S)-falcardindiol, Z-9-heptadecene-4,6-diyne-3-one and imperatorin (Deng et al, 2006). The methanol extract of *Angelica sinensis* has been shown to exhibit competitive binding to GABA(A) receptor in an in vitro binding assay. The GABAergic ligands were identified as gelispirolide and riligustilide (Deng et al, 2006). Japanese angelica was shown to have a significant antagonizing effect in scopolamine-induced memory impairment in rats (Ohta H et al, 1993).

*Radix glycyrrhizae* - Gan Cao has anti-inflammatory properties due to the inhibition of nitrous oxide (NO), IL-1β and IL-6 production in lipopolysaccharide (LPS) stimulated macrophages (Thiyayaegrajan P, Chandrasekaran CV, Deepak HB, Agarwal A, 2011).

*Herba menthae* - Bo He oil and (-)-menthol as its most active constituent exert their anti-emetic effect at least partly by acting on the 5-HT(3) receptor ion-channel complex, probably by binding to a modulatory site distinct from the serotonin binding site (Heimes K, Hauk F, Verspohl EJ, 2010). Methanolic extract of *Mentha piperita* has antioxidant, MAO-A inhibitory activity and affinity to the GABA(A)-receptor assay (López V et al, 2010).

*Rhizoma zingiberis recens* - Sheng Jiang has shown to inhibit expression of IL-12, TNF-α, IL1β in LPS stimulated macrophages, it also negatively affected the antigen presenting function of macrophages. T-cell proliferation was significantly reduced in response to allostimulation with ginger extract treated macrophages as antigen presenting cells.
IFN-γ and IL-2 production by T-cells was also significantly decreased in response to allostimulation (Tripathi S, Bruch D, Kittur DS, 2008).

**Discussion on serotonin metabolism**

Serotonin, or 5-hydroxytryptamine (5-HT), is a biogenic amine. It has been implicated in the pathophysiology of depression, mania and anxiety disorders, IBS, emesis, migraine and pulmonary and systemic hypertension. In the central nervous system serotonin is processed in several ways. Upon neuronal depolarization, serotonin is released into the synaptic cleft. It can bind to postsynaptic receptors (5-HT receptors) or serotonin autoreceptors on the presynaptic membrane. Binding of serotonin to the autoreceptor acts as a negative feedback against further release of serotonin into the synaptic cleft. After reuptake serotonin can be recycled back into presynaptic vesicles, or broken down in the cytosol by monoamine oxidase (MAO). The major metabolite of serotonin, when broken down by monoamine oxidase, is 5-hydroxyindoleacetic acid (5HIAA).

Serotonin, originating from the enterochromaffin cells in the GI system, is released into the portal circulation and quickly eliminated from the plasma via uptake into platelets and metabolism by the liver. IBS with diarrhea has been treated with selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants, implying serotonin is likely to an important player in the pathophysiology of IBS.

The earliest antidepressants, the MAO inhibitors and the tricyclic antidepressants, enhanced availability of serotonin as well as other biogenic amines, most importantly norepinefrine. The most potent and specific antidepressants is the class of drugs known as the SSRIs. They increase the amount of serotonin in the synaptic cleft and prevent the negative feedback from binding to the presynaptic receptor, thus further increasing availability of serotonin in the synaptic cleft. Depression in humans and animals is conventionally treated with monoamine reuptake inhibitors (SSRIs) and MAO inhibitors.

**The use of antidepressants in domestic animals**

Clomipramine (Clomicalm®, Novartis) is registered for separation anxiety in dogs and is used off label in cats. This is a tricyclic antidepressant. The following adverse reactions have been reported: lethargy/depression, elevation in liver enzymes, vomiting, diarrhea and increased thirst (Clomicalm package insert). In humans, tricyclic antidepressants are no longer first choice medicines due to the side effects and are mostly used in treatment of refractory cases.

Fluoxetide (Reconcile®, Elanco), an SSRI, is registered for use in dogs. The indication is separation anxiety. The most common adverse reactions recorded during clinical trials with Reconcile® were calm or lethargy, reduced appetite, vomiting, shaking, diarrhea, restlessness, excessive vocalization, aggression and infrequently seizures. About 33% of dogs on Reconcile experience lethargy, calm and depression. (Reconcile package insert). This would possibly make fluoxetide of limited use in the treatment of lethargy and depression in dogs.

**Discussion on Xiao Yao San as an antidepressant formula**

The Chinese Medicine Depression Syndrome, called Yu Zheng, has been treated for thousands of years with herbal formulas and acupuncture. It is associated with Liver Qi stagnation, brought on by grief, sadness and excessive worry. Xiao Yao San addresses this stagnation effect and the early stages of deficiency. It is used humans in acute and chronic cases of depression where sometimes pathology is quite severe or has been present for decades. Xiao Yao San is most appropriate in cases with introverted expressions of mental disease as it does not clear Heat which would manifest as agitation, hysteria or mania. The mechanism of action has only been partially elucidated.

A study comparing gene expression in cell cultures exposed to clomipramine, St John’s Wort or Xiao
Yao San found significant up-regulation of vimentin receptors and proteins affecting energy metabolism and cytoskeleton in all three groups compared to controls. This study provides preliminary evidence for multiple common molecular targets between conventional and alternative antidepressants, which appear to collectively affect neuronal plasticity (Pennington et al, 2009).

In a placebo controlled study the effect of Xiao Yao San on postpartum depression in rats was investigated and compared to the effect of fluoxetine hydrochloride, an SSRI). Xiao Yao San treatment significantly improved the behavior indexes and levels of monoamine neurotransmitters in hippocampus (P < 0.01). Xiao Yao Powder and fluoxetine hydrochloride produced similar effects in rats with postpartum depression (Tao Wang et al, 2010).

Yu compared fluoxetine with a combination of Xiao Yao San and Wen Dan Tang. The results were that both treatment groups showed significant improvement on the Hamilton Depression Scale with no significant difference between groups. There were fewer adverse reactions in the Xiao Yao San/ Wen Dan Tang group than in the fluoxetine group (Yu HT 2006).

Bao et al. found that Xiao Yao San at doses of 200, 400 and 600 mg/kg significantly increased the revolutions in a forced swimming test and ameliorated brain cortex 5-HT and 5-HIAA content of restrained mice. Xiao Yao San has a significant antidepressant effect which may be related to the potentiation of brain serotonergic function. (Bao L et al, 2007).

Both tricyclic antidepressants and SSRIs are equally effective in relieving global IBS symptoms, and have some benefits in treating abdominal pain (Joong Goo Kwon et al, 2011).

Serotonin Toxicity
Caution is advocated when combining Chinese herbal formulas that have anxiolytic and antidepressant actions with pharmacological anxiolytics and antidepressants. The mechanism of these Chinese herbal formulas remains ill-defined making interactions with pharmaceutical substances unclear and unpredictable. Serotonin toxicity has been documented in both human and veterinary medicine. Toxicities have occurred after accidental ingestion of 5-hydroxytryptophane, SSRIs, MAO inhibitors and tricyclic depressants. Concurrent opioid use increases the risk of serotonin toxicity. Tramadol especially is a concern since phenylpiperidine-opioids, tramadol and dextromethorphan are all weak SSRIs, but tramadol may also act as a serotonin releaser (Mohammad-Zadef L.F, Moses L, Gwaltney-Brant S.M, 2008).

Conclusion
Xiao Yao San provides an alternative treatment for depression in dogs with the appropriate Chinese medical diagnosis.

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Hind end weakness and decreasing energy in a 10-year-old dog treated with Bai Wei Di Huang Wan

Dr Tracey Henderson DVM CVCHM

Abstract
Some of the more common signs seen in aging dogs include stiff and sore joints, hind end weakness, decreased stamina and failing eyesight and hearing. Other than anti-inflammatories for osteoarthritis, conventional veterinary medicine does not have many drugs to help with what are commonly seen as unavoidable symptoms of a natural process. There are, however, herbal formulas that can help re-invigorate older dogs and slow the progression of aging signs. This case report deals with a ten-year-old Shepherd cross who presented for decreasing energy and mild hind-end weakness. She was being treated intermittently with a non-steroidal anti-inflammatory for pain relief but it had no effect on energy or on her hind end strength and stability. She was started on a Chinese classical formula called Ba Wei Di Huang Wan, or Rehmannia 8, and showed significant improvement after 2 months of treatment.

CASE PRESENTATION
Aster, a ten-year-old 21 kg spayed female Shepherd cross was seen for decreasing energy and weakness in the hind end. She had previously been diagnosed with two small lipomas (via fine needle aspirate and cytology) on her ventrum and radiographic evidence of arthritis in several metacarpal-phalangeal and inter-phalangeal joints in both front feet. In the last month, Aster had shown a significant decrease in stamina when exercising, was sleeping more, and was notably weaker in the hind end. Her back legs would give out on her when she was turning quickly or jumping. All symptoms were worse in warm weather. For the last two years she had been given Metacam (Meloxicam, Boehringer Ingleheim 2 mg every 24 hrs) on an as needed basis to alleviate the stiffness and soreness in her front feet. Although the non-steroidal anti-inflammatory worked well for the front end lameness, it did not help with the collapsing in the hind end nor did it have any positive effect on her energy level. Aster was a heat-seeker, choosing to lie in the sun or by the fireplace when possible and the owner thought she was drinking a little more than normal and that her hearing was deteriorating.

On physical exam, she was in ideal body condition, her ears were a bit moist but had no odor, erythema or unusual discharge. She had very mild bilateral nuclear sclerosis, several enlarged metacarpal-phalangeal and interphalangeal joints in both front feet, tender iliopsoas and quadratus lumborum muscles bilaterally, several small subcutaneous masses on her ventrum and mildly cool extremities. There were no abnormalities on neurological exam and she allowed full flexion and extension of her hips, stifles and hocks. She had decreased range of motion in both carpal joints and several metacarpal-phalangeal and interphalangeal joints. Aster was tender at BL 23, the Kidney Back Shu point, BL 26 and CV 12, the Stomach Alarm point, were both warm. Her tongue was red and dry with increased redness at the tip. Her pulse was deep, weak, thin and easily compressed.

Hematology done six months prior to presentation was normal and the owner declined any further blood work or radiographs.

From a western medical standpoint, Aster had arthritis in her front feet, bilateral nuclear sclerosis, several small lipomas, loss of hearing and low back stiffness. From a Traditional Chinese Medicine standpoint, she was diagnosed with deficient Kidney Yang, Yin, and Qi, deficient Liver Blood and Bony Bi syndrome.

Aster was started on Bai Wei Di Huang Wan (KAN:
550mg) at 1.5 tablets once a day then increased to twice a day dosing on the fourth day of treatment. After 3 weeks on the herbs the owner reported that Aster was sleeping less and her energy had increased. At recheck eight weeks after treatment had begun, Aster was back to her normal energetic self, running and jumping with only very occasional episodes of hind end weakness that were much subtler than they had been. Her pulse was wider and more moderate in depth although it was still fairly easily compressed. Her tongue was pinker, had lost the red tinge to the tip, was still dry and now had slight lavender color centrally. The only active point found was slight tenderness at GB 25, the Kidney Alarm point. The owner did not think her hearing had improved.

Discussion

From a western medical standpoint, Aster had symptoms typical of an aging dog. Her arthritis was worsening, she was getting stiffer in her hind end, less energetic and was periodically collapsing in the back end when running on slippery surfaces. The lack of any neurological signs and lack of pain in the joints and muscles of the hind end, with the exception of the iliopsoas and quadratus lumborum muscles, suggested that pain was not playing a significant role in her hind end weakness, although it could not be entirely ruled out as a contributing factor. The fact that Metacam only helped alleviate the forelimb stiffness further supports this assumption. Without further diagnostic tests, however, mild type II intervertebral disc disease, early neuromuscular degeneration and chronic degenerative joint disease could not be definitively ruled out. A normal blood picture and an otherwise healthy looking dog made systemic disease highly unlikely as a cause of either the weakness or decreasing energy.

In Traditional Chinese Medicine, the gradual loss of hearing, sight, energy and strength and many other aging signs, are caused by diminishing Kidney Essence (Macciocia 2005, 590), (Xie, Preast 2007, 81). The aging Zang-Fu organs have decreased ability to generate new Qi and Blood and ultimately post-natal Essence. With less post-natal Essence present to spare the consumption of pre-natal Essence, the stores of the latter are drawn upon and aging symptoms progress. Kidney Yin and Essence are inextricably linked and thus as Essence declines so too does Kidney Yin. Essence makes Qi and Yang also, so a decline in Essence also leads to some degree of Kidney Yang deficiency and ultimately Qi as well, leading to a further progression of lower back weakness, decreasing energy and many other aging symptoms.

In this dog, the pre-existence of lipomas and a lifetime diet of commercial refined carbohydrate dog food would suggest she had some degree of Spleen Qi deficiency and Dampness. Her moist ears on presentation fit with this notion. The arthritic joints of her front legs (Bony Bi) from the obstruction of the normal flow of Qi and Blood was likely caused by her underlying deficiencies. Kidney Yang deficiency (Schoen 2001, 162), Yin deficiency (Xie, Preast, 519) Blood deficiency and Dampness (Macciocia 2005, 307) and deficiencies of Qi (Xie, Preast, 529) can all cause obstructions to the smooth flow of Qi and Blood and thus lead to Bony Bi. A thin pulse, tiring easily, cool extremities and dry tongue all suggest some degree of Blood deficiency in Aster in addition to the Dampness and Kidney deficiencies noted above.

The worsening of back end weakness and poor energy during warm weather is curious given that this dog was generally a heat-seeker. Perhaps it suggests there was some degree of both Yin and Yang deficiency making exertion in warm, or Yang, weather more of a stress on her system. With decreased Yin and Blood available to counter the heating and drying effects of Yang energy created through physical exertion and from the ambient air, any pre-existing sluggish Qi and/or Blood flow would be exacerbated. Another possibility is that, in some patients, Qi and Blood can become scattered and ineffective of delivering power and nourishment if Yang has excessively mobilized them to the periphery. This would happen on a hot day especially. As a symptom, it would signal that the dog must be tonified and is not ready for moving herbs yet, since moving without tonifying would mimic the effects of a hot day and worsen the animal.
Table 1: Ingredients of Ba Wei Di Huang Wan
(from Chen 2001)

<table>
<thead>
<tr>
<th>Pin Yin Name</th>
<th>English Name</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shu Di Huang</td>
<td>Rehmannia root (prepared)</td>
<td>Nourishes Kidney and Liver Yin, Blood and replenishes Jing</td>
</tr>
<tr>
<td>Shan Yao</td>
<td>Chinese Yam root</td>
<td>Tonifies Qi, nourishes Yin (especially of Stomach, Spleen, Lung and Kidney)</td>
</tr>
<tr>
<td>Shan Zhu Yu</td>
<td>Asiatic cornelian cherry or Cornus</td>
<td>Tonifies Liver and Kidney, retains Jing and Body Fluids</td>
</tr>
<tr>
<td>Fu Ling</td>
<td>Poria</td>
<td>Tonifies Spleen Qi, drains Damp, calms the Shen</td>
</tr>
<tr>
<td>Ze Xie</td>
<td>Asian water plantain rhizome</td>
<td>Regulates water and Dampness accumulation, clears Deficiency Fire from the Kidney</td>
</tr>
<tr>
<td>Mu Dan Pi</td>
<td>Tree peony bark</td>
<td>Clears Heat, cools Blood, invigorates Blood circulation and disperses Blood stasis</td>
</tr>
<tr>
<td>Rou Gui</td>
<td>Cinnamon bark</td>
<td>Tonifies Kidney Yang and augments Ming Men Fire, dispels Cold and warms the Spleen</td>
</tr>
<tr>
<td>Fu Zi</td>
<td>Sichuan aconite root</td>
<td>Restores and tonifies Yang, warms channels, disperses Cold and Damp and Relieves Pain</td>
</tr>
</tbody>
</table>

Aster was put on Rehmannia Eight Combination or Ba Wei Di Huang Wan (BWDHW) to address her Kidney Yang, Yin and Qi deficiency and Blood deficiency. This ancient formula is primarily a Kidney Qi tonic (Marsden 2006, 12). It warms Kidney Yang and tonifies Yin and Blood, boosts Qi (Chen 2009: 669, 673), and thus supports the geriatric patient who is often deficient in all of these. The ingredients of BWDHW are Rehmannia root (Shu Di Huang), Chinese Yam root (Shan Yao), Asiatic Cornelian Cherry or Cornus (Shan Zhu Yu), Poria (Fu Ling), Asian Water Plantain rhizome (Ze Xie), Tree Peony bark (Mu Dan Pi), Chinese Cinnamon bark (Rou Gui) and Sichuan Aconite root (Fu Zi). The herbs and their actions can be found in Table I.

In people, the formula is commonly used to treat low back pain, weak legs, wasting syndrome, endocrine disorders including diabetes mellitus, Cushings disease and hypothyroidism (Chen and Chen, 672). It is also used to treat multiple disorders of the cardiovascular system including coronary artery disease, arteriostenosis, hyper- and hypotension, pulmonary disorders, multiple genitourinary disorders and eye diseases. (Chen and Chen 2009; 673). In animals it is most commonly used for chronic renal failure, although other indications include hypothyroidism, degenerative myelopathy, diabetes, infertility and asthma (Marsden 2006, 12).

Aster’s improved energy and mobility and improvements in pulse and tongue suggest that she had a good response to the tonifying effects of this formula. We see not only improved strength and mobility from the broad Kidney tonification properties of the formula, but corresponding positive changes in the pulse, tongue and active points. The depth of her pulse became more moderate as Kidney Yang was replenished and the Kidney back Shu point was no longer active. The redness of her tongue, particularly at the tip, from Heart Fire secondary to Kidney Yin deficiency also resolved as Kidney Yin and Blood were fortified and her pulse became wider.

The connection between the Heart and the Kidneys was restored by this formula by reintegrating the upper and lower jiaos. Specifically, Yin was added and Yang to steam it up to the upper burner. At the same time, the addition of both Yin and Yang to the Kidney resulted in the generation of Qi.

The lavender tinge of the tongue upon recheck would suggest some Qi or Blood stagnation was persisting and the dryness of the tongue indicated more Yin tonification was needed, so at this stage a
moving formula would have been helpful. Unfortunately, Aster’s owners were heading away on an extended holiday and did not want to change the formulation before they left as they were so pleased with how well Aster was doing.

A review of the scientific literature on the use of BWDHW provides further insight into the positive results seen in this case study. Case studies conducted by Hijikata et al (2007) suggested that BWDHW might have helped alleviate pain and swelling and sped healing in people with sprains, bruises or arthritis. This is not surprising as we know that several herbs found within BWDHW have demonstrated anti-inflammatory properties, such as Cornus, (Chen and Chen 2004, 1006), Tree Peony bark, (Chen and Chen 2004, 161) and Poria, (Chen 2004, 440).

It has been suggested that osteoarthritis shares the same biochemical and inflammatory profile as many of the symptoms and diseases associated with metabolic syndrome in humans (Katz, Agrawal, Velasquez 2010). These include hypercholesterolemia, other triglyceride abnormalities, hypertension, type II diabetes and obesity BWDHW and/or many of its constituent herbs have been shown to be useful in the treatment of these problems by normalizing plasma cholesterol and triglyceride levels (Hanaka 1986), improving lipid metabolism (Yoshida, Kusukawa, Watanabe, Ohitsuque, Sakamoto, Hanaka 1985) (Haranaka, Okada, Kosoto, Ohwada, Kobayashi, Yoshida 1986) and reducing the damage caused by oxidative stress in diabetic rats (Kim, Yokozawa, Cho, Yamabe, Yagi, Kanba 2005) (Yokozawa, Yamabe, Cho, Nakagawa, Oowada 2004). Individual herbal constituents of BWDHW have also proven effective for treating many of these diseases. Chinese wild yam rhizome has been shown to lower blood glucose levels (Chen and Chen 2001, 861) as does Cornus (Chen and Chen 2001, 1006). Rehmanna and Alisma have both been shown to lower blood pressure as well as cholesterol and triglycerides (Chen and Chen 2001, 387,926). Given BWDHW’s beneficial effect on many diseases associated with metabolic syndrome and the common physiochemical pathways and biochemical environments these diseases share with osteoarthritis, it is sensible to think that BWDHW would also be effective in alleviating symptoms of osteoarthritis. This hypothesis of course warrants more study.

We can also look at the known effects of individual constituent herbs of BWDHW to understand some of the treatment effects that were seen in this case study. Rehmanna, a major constituent of BWDHW, is an herb found in many formulas used to treat arthritis and aging (Dharmananda). Catapol, an iridoid glycoside isolated from Rehmanna, has been shown to be neuroprotective (Bi, Jiang, Liu, Lei, Zhang 2008)(Zhang, AN, Bao, Wang, Jiang 2008)(Kim, An, Jung, Choo, Park, Nam 1999) (Liang, DU, Xu, Jiang, Hao, Bi, Jiang 2009). With several of these studies and others (Yu, Kim, Jung, shin, Park, So, Kim, Lee, You 2006,) (Bi, Jiang, Liu, Lei, Zhang, An 2008) identifying the anti-oxidative properties of catapol as one mechanism of action. Catapol has also been shown to increase energy metabolism (Zhang, An, Bao, Wang, Jiang 2008) and although their study looked solely at brain energy metabolism and cognition, the mechanism(s) of action may be similar to upregulating energy metabolism in other systems of the body.

Aconite root, another constituent of BWDHW, acts as a positive inotrope and chronotrope, increases cardiac contractility and output and it also has analgesic and anti-inflammatory effects (Chen and Chen 2004, 440). Tree Peony bark has shown an ability to increase perfusion of coronary arteries and decrease blood pressure (Chen and Chen 2001, 161). In people, Yamada et al (2005) found that administering BWDHW increased energy in twelve patients who had major depressive disorder. All these herbs might thus have played a role in Aster’s increasing energy and stamina.

Rou Gui (cinnamon) was effectively used to treat 102 human patients with low back pain from Kidney Yang deficiency (Chen and Chen 2004, 449). This herb would also have helped Aster if there had been any Cold invasion, particularly if it was obstructing the channels and collaterals.
Similarly Aconite, another Yang tonic and Cold dispersing herb, would also have been beneficial. Several other herbs in BWDHW have anti-inflammatory and analgesic effects. Cornus and Tree Peony bark have been shown to have anti-inflammatory effects (Chen and Chen 2001, 1006, 161) and Xhi et al (1990) showed the anti-inflammatory and analgesic properties in rats and mice of alkaloids (aconitines) isolated from aconite.

Conclusion

Ba Wei Di Huang Wan was an effective formula to treat the hind end weakness and decreasing energy in this geriatric dog. Known primarily as a Kidney tonic formula, direct and indirect evidence was shown of the formula’s ability to tonify Yang, Yin, Qi and Blood. From a more western, biochemical standpoint, the known analgesic, anti-inflammatory and pro-metabolic properties of many of the herbs could have contributed to the improvements noted. Ba Wei Di Huang Wan proved to be an effective treatment for this patient and should be considered for similarly deficient dogs showing mild to moderate signs of hind end weakness and decreasing energy.

References


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Letters to the Editor

We welcome and encourage your letters and feedback. We envisage that your words will become part of a vibrant and ongoing dialogue within a growing community of integrative veterinarians and allied health professionals.

Email your letters to the CIVT Student Services and Communications Manager:
editor@civtedu.org.
Clinical Pearls: Ferret Chinese Herbal Protocol for Insulinoma

Dr Daren Auger DVM CVCHM

Given the carnivorous nature of ferrets, resembling that of felines, there is a predisposition for Damp Heat conditions to arise. This is highly correlated to an inappropriate diet used commercially for ferrets. Ferrets DO NOT properly digest carbohydrates and grains found in most processed kibble food. This puts a lot of work on the Spleen, which in Chinese Medicine is the organ of digestion and assimilation.

For this reason, dampness forms within the body, causing Qi and Blood congestion, leading to heat production as well as Stagnation. Damp Heat and Blood Stagnation account for most cases of tumor formation in ferrets that I see in my practice. I have had the advantage of using Chinese Herbal Therapy in a lot of rescue ferrets through our local Ferret Rescue Association. Their acceptance of complimentary modalities in addition to actively monitoring responses to therapy have allowed me to further my TCVM clinical database for this particular species.

My General Recommendations for Ferrets With Insulinoma

(Note: a full TCM evaluation is preferred as pattern recognition will dictate the formulas used, however, 90% of my rescue ferrets end up on this protocol).

1. Diet change: going to a grain free, low carb (<7%), high protein diet. Diets I like are Wellness Core (feline), Orijen (feline), Innova Evo (ferret) and Prowl (feline) dehydrated Raw food (from the Healthy Kitchen). (Note: since starting this protocol Innova has been bought out by the Iams company and so close monitoring of the ingredients is personally underway.)

2. Prednisone therapy.... I start @ 0.5mg/kg BID for the first couple of weeks to assess response to therapy as well as to make sure the ferret can tolerate the medication. Once stable, we can begin the weaning process @ 50% reduction every 3 weeks.

3. Traditional Chinese Herbal Therapy. I use a 50:50 combination of Si Miao San (Four Marvels) and Ge Xia Zhu Yu Tang (Dispel Stasis Below the Diaphragm). The Dose is 1/4 tsp BID per ferret (average weight = 1kg) in Ferretone or any ‘Duck Soup’ recipe. This is a permanent therapy that can potentiate the prednisone to reduce the dosage required. This has even allowed me to replace the prednisone therapy altogether.

Destiny: Treatment of Perianal Masses with Si Miao San

Dr Dolores Tyneway DVM CVA CCRT AVCA CVCHM

Abstract

A 16-year-old female spayed Schipperke presented with perianal masses. The masses had the appearance of a hormonally responsive tumor type known as a perianal adenoma. Multiple tumors typically present in intact male dogs. The development of perianal adenomas is considered an atypical presentation for a female spayed dog and is thought to be related to hormonal influences particularly from adrenal gland tumors. This dog had a prior history of lymphosarcoma that was treated with chemotherapy five years earlier and considered...
to be cured, and large bowel diarrhea that started after chemotherapy. A Traditional Chinese Medicine (TCM) herbal formula Si Miao San was presented as an option to treat this geriatric dog’s multiple issues as the owner chose to not pursue any further diagnostics and treatment due to the dog’s age. Since beginning treatment there has been no further development of perianal adenomas with only slight growth of the existing masses.

CASE PRESENTATION
Destiny is a 16-year-old spayed female Schipperke. Her weight on presentation was 12.7 kg.

Diagnosis
Destiny first presented on 7/10/2010 for the rapid development of two perianal masses. The owner had consulted with an oncologist who recommended abdominal ultrasound to evaluate an adrenal mass causing a hormonal influence or recurrence of her lymphosarcoma. The owner did not want to do any further testing and was looking for a way to manage Destiny’s disease as the prospect of removing an adrenal tumor, if there, was one she did not wish to pursue. Recurrence of lymphosarcoma was also a possibility with a paraneoplastic hormonal influence being exerted. In communication, the oncologist was ruling out an adrenal tumor as the most likely cause of this dog’s atypical presentation.

A summary of her prior records revealed that Destiny had a history of lymphosarcoma that was first detected in the inguinal and popliteal nodes in June 2006. She was treated with the Wisconsin Protocol/Short with no maintenance. After chemotherapy she developed soft stools with mucus and increased frequency of defecation with urgency. The symptoms were treated with Tylosin but did not resolve completely. With the addition of Budesonide her stools have normalized and she has been on it since. Destiny has a physical examination monthly to evaluate her lymph nodes. The owner noticed the development of two perianal masses that developed in a short time and were growing rapidly in July 2010. Destiny’s medications include budesonide at 1 mg daily. She is on a vegetarian prescription diet both canned and dry plus probiotics.

On presentation, Destiny was bright and strongly ambulatory and engaged for a dog her age. Her physical exam revealed dental tartar and halitosis, a BCS of 7/9 (Purina scale), and two perianal 0.25 cm raised lesions measuring 0.5 cm in diameter at the four o’clock position and 1.5 cm in diameter at the six o’clock position. She had decreased range of motion in both her hips and knees. She was stiff in her movement but not overtly painful on examination.

Her TCM evaluation revealed an outgoing wood personality. Her tongue was swollen and lavender/pink. Her pulse was slippery. She panted readily throughout the exam and prefers to rest on cool surfaces and gets hot easily in the sun. She is reported to drink a lot of water.

Table 1: Summary of follow ups

<table>
<thead>
<tr>
<th>Date</th>
<th>Mass at 4 o’clock</th>
<th>Mass at 6 o’clock</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/10/2010**</td>
<td>0.5 cm</td>
<td>1.5 cm</td>
<td>Tongue: Lavender/pink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pulse: slippery</td>
</tr>
<tr>
<td>7/20/2010*</td>
<td>0.5 cm</td>
<td>1.25 cm</td>
<td></td>
</tr>
<tr>
<td>8/24/2010*</td>
<td>0.3 cm</td>
<td>1.2 cm</td>
<td></td>
</tr>
<tr>
<td>9/28/2010*</td>
<td>0.5 cm</td>
<td>1.25 cm</td>
<td></td>
</tr>
<tr>
<td>10/28/2010*</td>
<td>0.5 cm</td>
<td>1.5 cm</td>
<td></td>
</tr>
<tr>
<td>11/22/2010*</td>
<td>0.5 cm</td>
<td>1.5 cm</td>
<td></td>
</tr>
<tr>
<td>12/21/2010*</td>
<td>0.3 cm</td>
<td>1.7 cm</td>
<td></td>
</tr>
<tr>
<td>1/28/2011**</td>
<td>0.5 cm</td>
<td>1.7 cm</td>
<td>Tongue: Lavender/pink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pulse: slippery</td>
</tr>
<tr>
<td>2/10/11**</td>
<td>0.5 cm</td>
<td>1.7 cm</td>
<td>Tongue: Lavender/pink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pulse: slippery</td>
</tr>
</tbody>
</table>

*Denotes visit to the regular veterinarian  
**Denotes dates of TCM Assessment/Tongue and Pulse evaluation for refill of prescription

A TCM diagnosis of damp heat in the Lower Jiao was made. This was based on the presentation of the tumors in the perianal area and the tongue and pulse signs. One could presume she is susceptible to this
pattern of disease as evidenced by her prior history of lymphosarcoma in lymph nodes in the Lower Liao and large bowel diarrhea history.

Spleen deficiency is a common cause of dampness (Marsden, 2009). Signs of Spleen deficiency and dampness are exhibited in this patient with an increased body condition score of 7/9 (normal is 4/9-5/9), chronic diarrhea and the feeding of carbohydrate rich commercial kibble. Dampness is also exhibited in the hind leg stiffness and the development of tumors such as the lymphosarcoma and the perianal masses. Lymphosarcoma can be attributed to heat conditions (Marsden, 2009). Heat signs were the continuous panting, halitosis, polydypsia, and large bowel diarrhea that responded to cooling effects of budesonide, a corticosteroid. This patient may very well have been damaged by the effects of chemotherapy. A clinical picture of Heat Pathogen Invasion often accompanies patients that were treated with chemotherapy (Marsden, 2009). Heat pathogens are introduced during chemotherapy and can cause severe pathology such as severe diarrhea, which in this case has been more of a chronic nature.

Treatment

Si Miao San (Four Marvels Powder) contains Cang Zhu (Atractylodes rhizome), Huai Niu Xi (Achranthes Root), Yi Yi Ren (Coix seed) and Huang Bai (Phellodendron bark). In TCM Spleen deficiency leads to the development of dampness, which ultimately leads to heat. The Huang Bai (phellodendron) in the formula is cooling. Coix drains damp and supports the spleen. Achyranthes has an astringing effect on fluid loss and counteracts the drying effect of the other herbs. This characteristic makes the formula suitable for long term use (Marsden, 2009). The pathogenic effects of pathogenic heat factors of chemotherapy can be reversed with the addition of a suitable formula for the patient, in this case Si Miao San (Marsden, 2009).

Si Miao San powder at ¾ tsp every twelve hours.

Results

Destiny was examined monthly for growth of the perianal adenomas and for palpation of her lymph nodes due to her history of lymphosarcoma. Lymph node palpation was normal at all times. The date of examination, measurements and location of the masses and tongue and pulse evaluation are in Table 1.

Discussion

Spleen deficiency usually underlies the development of damp heat and is often the result of long term feeding of commercial kibble. In Chinese Medicine the Spleen is overwhelmed by the feeding of carbohydrates. In conventional medicine, high protein/low carbohydrate diets are recommended as neoplastic cells rely on anaerobic glycolysis (Marsden, 2009). The owner was not willing to change from the vegetarian diet to a lower glycemic meat based diet as Destiny’s stools normalized when fed this diet as opposed to trials with multiple limited antigen diets. It is possible that she has a food allergy and the vegetarian diet proved to have novel ingredients. Spleen deficiency along with a dampening higher carbohydrate diet is a predisposing factor to the development of lymphoma from a TCM standpoint (Marsden, 2009).

It was not determined if Destiny had an adrenal mass producing hormones that led to the development of the adenomas as an ultrasound was not performed. In addition, no biopsy was done to reveal these were perianal adenomas, although the presentation was classical with the exception that this was a female dog. Tests for atypical hyperadrenocortism were not performed which may have been helpful in ascertaining if the adrenals were the source of the hormonal influence. Although the mechanism of Si Miao San in controlling Cushings has not been determined, it has been proposed that the beta-sitosterol content of phellodendron can help normalize adrenal cortical output (Marsden, 2009). Sitosterols are one of the most common sterols found in plants and act as hormonal growth regulators in plants (Wynn 2006). A study with prostate cancer in mice showed that an extract of Phellodendron amurense bark extract...
suppressed proliferation of cancer cell lines (Ghosh 2007). The mechanism of action is through inhibition of the expression of the COX-2 enzyme. Treatment of the mouse prostate cancer model with *Phellodendron amurense* extract reduced tumor necrosis factor alpha-induced as well as promoter activities of Cox-2. Conventional treatment of certain cancers in animals with nonsteroidal anti-inflammatories that work through similar mechanisms has been employed with tumors such as transitional cell carcinomas of the canine bladder with Piroxicam. Interestingly, this is a tumor that would be located in the lower Jiao where *Phellodendron* is believed to act by draining dampness. Yi Yi Ren (Coix) alcohol extract has mild antineoplastic effects in some in vitro studies (Chen 2004a).

This patient should be monitored over time for the development of Yin deficiency from the drying effects of the herbs, and thus far Destiny has done well. I suspect that the dry vegetarian diet the owner is feeding generates some dampness that is counteracted by the formula. In addition, as stated above, the astringing effects of Achyranthes makes this a suitable formula for long term use (Marsden, 2009), but its cooling nature must be closely observed in geriatric dogs.

The masses did not disappear while on Si Miao San, however, the pattern of growth stopped with one, and slowed with the other. There was never any infection or discomfort associated with these masses which I would have expected in the four months in the monitoring period. It would have been nice to have an ultrasound of the adrenal glands to document a mass and see if the herbal prescription was decreasing or controlling its size and to explore further if this was the source of the hormonal influence. The size of the masses differed slightly when measuring which could be attributed to variations in measurement or hormonal fluctuations affecting their size. An assumption was made that these masses were perianal adenomas. These tumors comprise 80% of all masses in the perianal area. If seen in older females, they are usually attributed to testosterone secretion from the adrenal gland (Withrow 2001).

Dogs with perianal adenomas typically present with multiple masses versus adenocarcinomas that are malignant and usually present as solitary masses. TCM has the ability to evaluate a patient and address tendencies toward a pattern of disharmony that can manifest itself in multiple disease processes. This dog has a history of lymphosarcoma found first in the inguinal and later the popliteal which are nodes that would be a part of the Lower Jiao area. A prior history of large bowel diarrhea and colitis signs managed with the corticosteroid budesonide also fit a pattern of damp heat in the Lower Jiao as does the development of perianal adenomas. The underlying deficiency leads to a repeated pattern of excess which manifests as damp heat in a common area of accumulation, the Lower Jiao.

**Summary**

TCM looks at disease processes as interrelated and often arising from an imbalance. In this situation, the pattern of disease was repeated presentation of Damp Heat in the Lower Jiao secondary to Spleen deficiency. This patient’s disease process was successfully treated with Si Miao San as the masses (presumptive perianal adenomas) that had appeared rapidly and were growing, were contained and did not go on to become infected or ulcerated. Most importantly, they were never any source of discomfort. There was no recurrence of the lymphoma during the treatment and her gastrointestinal issues did not manifest during the treatment period. I would also consider it a success that there was no further development of masses and that both the oncologist and regular veterinarian were happy with Destiny’s progress. Her quality of life throughout the treatment period has been excellent.

**References**


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Clinical Pearl: Herbal Prescription Handout

Dr. Steffi Van Der Laarse DVM CVCHM

Chinese Veterinary Herbal Medicine is both an ancient and a modern way of promoting health in animals. The Herbal Formulas are often hundreds, sometimes even thousands, of years old, but in modern veterinary medicine their use is still relatively new. They are a powerful treatment modality and when used appropriately have a low risk. However, when a formula does not fit the disease pattern of the patient perfectly it can cause adverse reactions. They are therefore not necessarily “safe” in the hands of untrained individuals. Herbal Medicine is part of a highly personalized treatment plan. The herbs prescribed for your pet may potentially harm another animal, even when it suffers from the same disease. So the herbal formula dispensed for your animal is for your animal only!

On the first 2 days give only half the dose stated below to get your animal started on the Formula

Name of Formula………………………………….
Dose …spoon … X day morning / evening

Name of Formula………………………………….
Dose …spoon …. X day morning / evening

Name of Formula………………………………….
Dose … spoon … X day morning / evening

Use the spoon provided and do not alter the dose without consulting the prescribing vet first!

Herbs can be mixed with the normal food. If a dog does not eat his food with the herbs in it, you can mix it with a little bit of tinned cat food and see if that will tempt your dog to eat it. Another option is to mix the herbs with a little lukewarm water and administer it directly into his mouth. Most cats will take herbal formulas when mixed with strong tasting food like fish.

Side effects

Any side effect you notice is a clue to a deeper understanding of what is happening with your pet. However minor they may seem in your opinion, they are extremely valuable information for assessing the pattern correctly. They can direct me in what the next step should be. So please contact me on my email [youremail@your.com] if you feel there are side effects. If there are none it doesn’t mean nothing is changing! It just means the formula and the dosage do not need to be adjusted for now. If you feel you need to get in touch with me right away call [your number] and leave a message I will contact you shortly afterwards.
Abstract
Respiratory disease is commonly seen in pet rats, and is caused by any number of infectious agents, primarily *Mycoplasma pulmonis*, but other bacterial, viral and fungal agents can cause primary or secondary infections as well. The infections are generally chronic causing severe upper respiratory signs if left untreated, often leading to pneumonia and death. Treatment options used in conventional medicine include the long term, and/or intermittent use of antibiotics, nebulization, oxygen therapy and sometimes bronchodilators and corticosteroids. Husbandry improvement such as decreasing stress, maintaining a clean cage and using non-aromatic/non-toxic bedding (no cedar or pine) are recommended to control recurrences of clinical signs. Rats with chronic respiratory disease (CRD) are, in general, expected to have a shortened life-span, living no more than 22-24 months (the expected life span for rats can range from 24-42 months)

The herb, echinacea (*Echinacea purpurea* or *E. angustifolia*) has been suggested for treatment in rats with CRD, but in searching the literature, no reports were found of its use for this purpose. Echinacea has been found to have anti-neoplastic properties with long term use in mice (*Brousseau and Miller 2005*), indicating the safety and potential benefits of using it long-term in rodents. This case presents the lifelong management of a pet rat with CRD using *Echinacea purpurea*.

CASE PRESENTATION
Ruby Tuesday was a female hooded ‘fancy’ rat obtained from a pet shop in March 2008. She was full grown and the owner was told she was approximately 5-6 months old, making her birth month October or November 2007. Some of the other rats she was housed with exhibited signs of upper respiratory disease including sneezing and evidence of tearing around the eyes. Although Ruby did not initially show signs of disease, exposure was apparent.

During her first months, Ruby’s temperament was very nervous, spending much of the time hiding. Over the next 3-4 months she became calmer and more active, trusting handling. Her diet consisted of rat ‘lab blocks’ supplemented with small amounts of fruits and vegetables as well as seeds and oats used when training and handling. ‘Carefresh’ paper bedding was used.

Within a few months she was regularly showing signs of sneezing, porphorin tear formation and having more rapid respiration with increased effort.

Treatment
Initially the rat was started on doxycycline 10mg/kg daily – continued for 1 week following the resolution of clinical signs. Total treatment period was approximately 4-5 weeks. Improvement was seen, but soon after discontinuing the antibiotic, signs returned. At this time, alternatives to life-long antibiotic therapy were researched and the use of echinacea was suggested.

*Echinacea purpurea* was initiated at a dose of approximately 133mg/kg per day. The 375g rat was given a total dose of approximately 50mg dried powder from a 350mg capsule sprinked on food daily (one capsule lasted approximately 7 days). The dosing was not exact and not all was ingested, but it stayed well within the suggested dose range of 25-300mg/kg.
**Herb Selection and rationale**

*Echinacea purpurea*

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Purple coneflower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Asteraceae</td>
</tr>
<tr>
<td>Part Used</td>
<td>Roots and aerial parts</td>
</tr>
</tbody>
</table>

**Actions**

Alterative, immunestimulant, antimicrobial, anti-inflammatory, local anesthetic, vulnerary, carminative.

Energetics: pungent, cooling, slightly bitter, slightly sweet

**Indications**

Acute and chronic bacterial and viral infections, septicemia, anti-neoplastic, local pain relief - stomatitis, skin

**Contraindications**

Allergy to Asteraceae family, possible contraindication in autoimmune disease, though not proven.

**Dosage (use animal doses where available, otherwise human doses can be included here but specify)**

*Dried herb*: 25-300mg/kg divided daily (TID optimal) – can go higher in acute infections

*Infusion and decoction*: 5-30g per cup water, ¼-1/2 cup/ 10kg (20lbs), divided daily (TID optimal)

*Tincture (40-70% ethanol)*

1:2-1:3: 0.5-1.5 ml per 10kg (20lbs) divided daily (TID optimal) diluted or combined with other herbs

**Results**

Improvement of respiratory signs was seen within less than a week of initiating echinacea therapy. The patient did continue to have occasional sneezing and signs of porphorin tearing throughout her life, but the respiratory distress only returned the few times the owner discontinued the echinacea and signs resolved within a few days of re-instituting therapy.

Ruby lived until September 2010, her estimated age at death was 34-35 months, with no more antibiotic use after the initial treatment. She developed a mammary tumor, generally benign in this species, but rapid growth and large size often leads to complications. This mass grew to approximately 4 cm in diameter over the last 5 months of her life. This was a relatively slow-growing mass, which did not seem to interfere with quality of life. In the last 2 months she began to develop periodic ulceration and scabbing where the skin was stretched thin over the mass. This was treated as it occurred with a calendula salve (olive oil and beeswax base) and resolved within a few days upon treatment.

**Conclusion**

*Echinacea purpurea* use appeared to be highly effective in the long-term management of upper respiratory disease in this patient, especially evidenced by periods where the herb was not used and the condition worsened, then improving again when treatment was reinstated. Antibiotic use was not required to control chronic disease. This patient lived for approximately 34-35 months, which is longer than expected with chronic respiratory disease in this species.

Additionally, the mammary tumor that developed appeared to grow more slowly than expected and the use of the calendula salve controlled the skin lesions keeping the tumor from being a primary health concern towards the end of the rat’s life.

The use of this immune-supporting herb along with the healing salve suggests the benefit of supporting the natural healing and protective systems of the body allowing it to heal itself. Although this is a single case, these results warrant further investigation into the use of *Echinacea purpurea* for the long-term management of CRD as well as the prevention or reduction of neoplasia in pet rats.

**References**

Introduction
The 16th century was a very important and interesting time in the history of herbal medicine. It was during this century that Henry VIII granted the Herbalist’s Charter in 1542. It was also during this period that John Gerard wrote his famous book *The Great Herball or Generall Historie of Plants* (1597). However, the end of this century was the beginning of the age of chemical medicine, with Paracelsus and his mercury cure of Calomel firmly on the agenda for all forward thinking physicians.

Henry VIII
King Henry VIII (1491-1547) was a great advocate of herbal medicine and, as well as treatment from his own apothecaries, he enjoyed making his own remedies. He found the actual preparation and compounding of the plasters and ointments particularly fascinating and in fact he carried his own set of apothecary’s equipment with him on his travels. A manuscript preserved in the British Museum records a royal collection of 114 favorite recipes, all possibly composed by the king himself, for ‘plastres’ and ‘cataplasmes’ (poultices), and for balmes, lotions and decoctions.

*Melilotis Officinalis (King’s Clover)*
Henry VIII had good reason to take an interest in herbs, because for most of his life he suffered greatly with his health. He had non-healing ulcers on his leg (from a riding accident), as well as the likelihood of sexually transmitted diseases. The herbs and other ingredients that Henry used would have been a good reflection of the standard medical practice at the time. Most of them were the plants and flowers recorded since Dioscorides, for their soothing, cooling and healing properties. These would have been likely to include plantain (*Plantago major*), linseed (*Linum usitatissimum*, used as the base for many poultices), as well as fenugreek (*Trigonella foenum-graceum*) and marguerite (*Chrysanthemum leucanthemum*). He also used marshmallow (*Althaea officinalis*) as a poultice for inflammation and the sweet scented yellow flowers of the tall weed melilot (*Melilotis officinalis*). This was such a popular herb with the king that the country folk came to call it king’s clover. It was used to treat inflammation and country herbalists used a poultice of melilot ‘boiled in sweet wine’ with ‘the yolke of a roasted egg, linseed, marshmallow and hog’s greece’ as the best thing to ease many forms of inflammation. The farmers, however, found king’s clover to be a terrible weed, as it took over their farmland – it was not so popular with them!

It was under Henry that the Herbalist’s Charter, an act of parliament that protected the herbalist’s livelihood and right to practice, came into being in 1542. Ironically though, in spite of his love of herbs, it was Henry’s dissolution of the monasteries that saw the destruction of many of the herbs he professed to love as the physic gardens were destroyed.

Elizabethan England
In England the Elizabethan era marked the beginning of the English Renaissance and in London every kind of person, from the commoner to the highest ranking, were obsessed with their new passion for botany and science. They exchanged rare herbs, distilled plants, experimented with new found metals, and recorded their findings – this was truly ‘the age of enlightenment’. This period represented a flourishing of new ideas and discoveries across all areas of human endeavor, including that of herbalism (and later alchemy) and everything relating to the natural world. Queen Elizabeth I (1558-1603), like her father King Henry
VIII before her, was a passionate advocate of herbal medicine and had her own gardens planted (some of these under the directions of John Gerard).

Shakespeare was around at this time and his plays are replete with knowledgeable references to herbs – such as in the following extract from A Winter’s Tale (1611), “Hot lavender, mints, savory, marjoram; the marigold, that goes to bed wi’ the sun, and with him rise weeping”.

Gerard and the Herballs

With the recent advent of the printing press, great new herbals from all over Europe began to appear in the 16th century. The first printed herbal in England was Bancke’s Herbal, author unknown but likely to be a compilation from medieval manuscripts from 1524. The first illustrated herbal in England was Grete Herball (1526), a translation of other herbals, perhaps those such as Herbarum Vivae Eicones (1530) by Otto Brunfels and De Historias stirpium (1542) by Leonhart Fuchs. New Herball (1551) by William Turner was influential, but the most famous English herbal was John Gerard’s The Herball or General Historie of Plantes (1597). This was, and still is, considered such an important book because it is so beautifully written and illustrated, and both useful and delightful to read. It reflects the theory that herbs treat not only the physical diseases but also those of the mind and spirit. John Gerard (1545-1611) was born in Nantwich and apprenticed to a barber-surgeon at seventeen, and for a while in his youth was a naval surgeon. Then in 1577 he began to supervise the London gardens of William Cecil, Lord Burghley, and from here his career as botanist, gardener and writer began. He had his own very successful garden in Holborn, where he grew over 1,000 different plants, including many exotic species from the New World. In 1597 Gerard was appointed Master of the Company of Barber-Surgeons, a prestigious position, and published his Great Herball the same year. The origins of this work, famous for its stylish and detailed, if not always accurate, descriptions of plants, are somewhat controversial.

The Queen’s printer, John Norton, commissioned a Dr Priest to do an English translation of a popular herbal. Preist died before completing it and John Gerard stepped in to take his place. Gerard, however, reworked the entire herbal as his own (he told Norton that the old version had disappeared). As if this wasn’t enough, he added new, as yet unpublished, material taken from his friend L’Obel, the internationally recognized botanist. L’Obel discovered this plagiarized work on a visit to the printers and he also found there were many botanical inaccuracies and errors within the text. Norton, not wanting to produce an inaccurate herbal, then hired L’Obel to correct the proofs. But when Gerard heard of this he had L’Obel fired! Ironically, one of these errors turned out to be the spelling of Gerard’s own surname on the front piece!

As the story of the writing of the herbal contests, Gerard was quite a character. Another example of his obstinacy and faith in his own opinions was in reference to Yew. It is more or less universally acknowledged that the berries of the Yew tree are poisonous to man and beast. Yet here in the extract from his herbal you can read that Gerard says words to the effect of ‘no harm ever came to him or his schoolmates when they frequently ate yew berries and also slept in the branches of the Yew tree (believed to be a bad omen)’!

By the late 16th century every respectable library in the kingdom would have possessed one of these fine new Herbals. The vast majority of these works were written by and for physicians, surgeons or apothecaries – professional men that wanted to have available in clear, concise form all the most important information to be found in the works of the Greek, Latin or Arab herbals. However, despite all the botanical theorizing, many physicians of this period were greatly lacking in the any practical knowledge and understanding of herbal medicine. Indeed Paracelsus was shocked at the ignorance and indifference that most doctors of the time showed towards the herbs in their own back gardens and
said that physicians and apothecaries only seemed to be impressed by exotic, imported herbs.

The fact was that most physicians in the 16th century were not interested in pursuing the study of medicinal herbs other than on paper, in elegant herbals and within the confines of the humoral system. It seems that few attempted any investigations into the actions and effects of the abundance of home-grown plants flourishing all around them, probably due to snobbery. Indeed, physicians rather held themselves far above the rest of the population at this time, having studied medicine for up to fourteen years at the universities of either Cambridge or Oxford. (Thomas Linacre, Henry VIII’s personal physician was thirty-two by the time he graduated). Was it any wonder that after this extensive period of theoretical training that they considered the effect of the simple flower or weed that grew in the hedgerow somewhat lacking in medical kudos? The German physician Leonhart Fuchs (1501-1566) took his fellow physicians to task when he said “…by immortal God, is it to be wondered at that kings and princes do not all regard the…investigation of plants, when even the physicians of our time so shrink from it that it is scarcely possible to find one among a hundred who has an accurate knowledge of even …a few plants”.

The Home Herbal
Royalty were keen on herbs and so too was the common housewife. Indeed, she had to be – since in Elizabethan England disease was widespread and sanitation very poor. In cities such as London, streets were filled with rotting garbage and animals were allowed to defecate wherever they pleased. Sewers were often blocked and rivers were contaminated by domestic waste. Epidemic diseases became increasingly common due to fleas and lice and were especially prevalent among children. Common diseases arising from the lack of sanitation included smallpox, measles, malaria, typhus, diphtheria, scarlet fever and chickenpox. Two life-threatening ailments in particular were relatively common in this period, the first being ‘strangury’ or the stone, causing pain and difficulty in urinating. The herbs with diuretic action such as butcher’s broom (Ruscus aculeatus), and horsetail (Equisetum arvense) were often used to treat this common complaint. The second was ‘ague’, which is synonymous with what we know today as malaria and was at that time almost endemic in northern Europe. Before the use of quinine, the herb tormentil (Potentilla erecta) was said to effectively treat ague. As the 16th century was also the period of discovery and exploration, it was common that explorers and travelers, who contracted diseases such as malaria and sexually transmitted diseases like syphilis in foreign countries, would bring them back to England.

Advanced medicine did not exist back in the 16th century, therefore people usually made their own medicines and potions using herbs and plants. Most people preferred home medicine and household remedy, as they were much cheaper than seeing doctors and physicians. Gerard’s Herball was a very popular book with ordinary people because of its practical and useful advice and ease of use (it has a comprehensive index listing all common ailments). Those who could not afford Gerard’s or who could not read would have to use cures passed down by word of mouth, or seek out the local healer. Alternatively, some people would carefully note useful treatments or cures in family recipe books, such as the one illustrated (left) from the Pinney family of Bristol in the 1700s.

Examples of herbal and plant usage of the time include the following: treatment for headache - rose, lavender and other sweet-scented herbs. Treatment for earache – roasted onion (placed inside the ear). Treatment for stomachache – wormwood, mint, and balm. A page from a family recipe and medicine book from a wealthy family of Salve traders in Bristol in the 17th century describes ‘Lady Isabella Leigh’s recipe for strengthening the eyes’ and includes the use of Greater Celandine, snail shells and egg yolks!

People also tried to cure diseases using methods based on their superstitious beliefs. For example, some believed that the use of magic and gemstones
could cure mental illnesses and emotional discomfort. Astrology was also widely practised. They believed in the four different internal ‘humours’ (liquids) represented by the four elements of air, water, earth and fire, and that the disruption in the balance among the elements would make one sick.

**Physicians, Barber-Surgeons and Apothecaries**

In these times a ‘doctor’ we know today was very different. Instead of being trained in all aspects of medicine and surgery as they are nowadays, back in the Elizabethan era the role of the doctor was broadly divided into surgeons, barber surgeons, apothecaries and physicians. The surgeons had neither Charter nor Guild, were theoretically meant to stick to surgery and leave internal medicine to the physicians. However, much to the chagrin of the physicians because of the new scourge of syphilis, they had begun branching out into medicine to increase their profitability. Then, next rung down the ladder from the surgeon were the ‘barber-surgeons’, who were a proud and independent City company who had obtained a Royal Charter in 1462. These men were expected to confine themselves to the lower orders of surgery, cupping, bleeding and tooth extractions. Next in importance came the apothecaries, who learned their craft as apprentices and yet were just a small cog in the enormously powerful wheel that was the Grocer’s Company. The apothecary had to stock all the drugs commonly used in medicine, so they would be on hand and available for the physician to prescribe. Not only did they have to stock the drugs, the apothecary, being part of the Company of Grocer’s, was in business to sell all the popular sugar confections, spices, syrups and electuaries. The apothecaries often felt very hard done by because they fancied that they knew as much, and usually more, than any grand ‘booked-learned’ physician.

**Quacks and Amateurs**

Below these ranks of skilled or semi-skilled practitioners were the masses of ‘ignorant persons, of whom the greater part had no insight into physic, nor in any other kind of learning; some could not even read the letter on the book, so far forth, that common artificers, smiths, weavers and women, boldly and accustomably took upon them great cures, to the high displeasure of God, great infamy of the faculty, and the grievous hurt, damage and destruction of many of the King’s liege of people’ (an extract from the preamble in the Letters Patent that gave Linnacre his college of Physicians).

The flood of readable and accessible herbals made home-doctoring using ‘simples’ a popular pastime for the amateur. Alongside these ‘hobby herbalists’, England and London in particular was becoming over-run with self-styled medical practitioners of every kind. However, these ‘quacks’ were fundamentally a necessity in Elizabethan London because with the huge fees charged by the surgeons, physicians and apothecaries. Who else was there apart from the so-called ‘quack’ to treat the poor and sick? As populations and the cost of living soared, harvests failed and famine ripped through the country, there was a real and urgent need for the herbalists to be allowed to treat their patients without being attacked by the physicians.

In the 16th century, the life span was shorter than that of today. The average lifespan of an adult male was 47 years, while the life expectancy of people in London was 35 years for the richer ones and only 25 years for the poor, with around 40% of the population dying before reaching their twenties. Death in infancy or early childhood was common. The short lifespan was due to many factors. For example, the poor sanitation in England, especially in big cities such as London, where epidemic diseases were widely spread. It was very common for children to contract various diseases and die at a young age as some homemade medicines were ineffective and inadequate and many ill children were abandoned during the 16th century. Death in childbirth was also common. Moreover, due to the high costs of seeing a physician and the use of non-advanced medicine, people were unable to cure all diseases with their homemade medicine. Surgical procedures were very basic without the use of high-tech machines and instruments. As the tools and instruments were not thoroughly and properly disinfected, wounds were often infected which led to many deaths during and after operations.

**The Battle Begins**

Throughout the 16th century, the division between university-trained doctors and other practitioners
such as midwives, herbalists and bone-crackers (the so-called ‘quacks’) grew. Physicians and apothecaries/herbalists had to work side-by-side during this period – with the rich mostly opting for the services of the physician and the poor having no choice but to be tended to by the nearest and cheapest healer. This was an uneasy time for the physicians who were practitioners of contemporary alchemy, and clashed fiercely with the lay-healers and herbal medicine practitioners. It was probably the illiterate smiths and weavers who particularly riled the physicians and made them anxious to see a law passed to stop such amateurs stealing their trade. There was obviously a need for some form of control and regulation of this seething mass of practitioners, especially in London where people were particularly vulnerable to exploitation by quacks. To stop this flood of lay practitioners and the associated competition with trained physicians, the English Parliament passed a series of acts to regulate the practice of medicine in London and the provinces. The first Act, passed in 1512, dealt chiefly with London, restricting the practice of medicine within a seven-mile radius of the capital to graduates of either Oxford or Cambridge. The exception to this was if the Bishop of London on the recommendation of four physicians had licensed others. Six years later, in 1518, the College of Physicians was set up by Letters Patent as the formal regulatory body for physicians.

The Quacks Charter
One of the first consequences of the Act of 1512 was to immediately start a kind of domino effect throughout the medical hierarchy. The physicians started to sue the surgeons for improperly practising they in turn would sue the barber-surgeons for the same and then they would collectively round on the poor apothecary for occasionally dispensing his drugs in order to bring in an extra penny. However, the real blow to these skilled medical men was felt when they tried to use one of the new Acts to stop local healers from practising their home remedies. Far from being a sitting target, some of these humble unlicensed practitioners had friends in high places (including King Henry VIII) and certainly didn’t take their persecution lying down. The result was the passing of what is known as ‘The Quacks Charter’ in 1542. This new Act stated as follows: ‘it shall be lawful to every person…having knowledge and experience of the nature of Herbs, Roots and Waters…to practice, use and minister…without suit, vexation, trouble, penalty, or loss of their goods’. The last words of the Charter were a warning to the physicians that they could not invoke any powers granted to them under previous legislation to meddle with the newly legalized herbalists. The details of the Charter are fascinating because they actually list a range of ailments that the herbalists were allowed to treat that was far wider than that of the surgeon. It included ‘any outward sore, uncome, wound, apostemations, outward swelling or disease, any herb or herbs, ointments, baths, pultes and amplaiters, according to their cunning, experience and knowledge in any of the diseases, sores and maladies before-said, and all other like to the same’. Thus they were allowed to give drinks, being internal medicine, the province of the physician. The College of Physicians were so flummoxed and felt so deceived by this Act that they continued to protest against it for many years to come. More than a century later Dr Charles Goodall (1642-1712), a fellow at the Royal College of physicians, wrote a long account of his struggles against ‘Empiricks and unlicensed Practicers’. All to no avail, the ‘The Herbalists Charter’, as it is otherwise known today, is still the mainstay of support for herbal practice today. It is under the protection of this charter that therapists in England are still able to practice to this day. However, things are just about to change, as new regulations from Europe will require any herbalist to possess a recognized qualification in order to practice.

Alchemy: a New Chapter in Medicine
By the end of the 16th century, the burning issue of the day was the advent of the new chemical medicine that had replaced the question of the unlicensed practitioner or quack. This was to be one of the greatest challenges to the traditional Galenic humoral practice of medicine at this time. It came from a Swiss doctor called Phillipus Theophratus Bombastus von Hohenheim (1493-1541), also known as Paracelsus. He rejected the theoretical dogma of Hippocrates and Galen and looked instead at a more scientific approach to medicine, in accord
with this time of world discovery (Christopher Columbus) and changing perspectives. He believed that humans functioned chemically and that ill health could thus be treated chemically. He looked to the active constituents of plants, as well as minerals, and believed these were the reason for their action as medicine. Paracelsus was a great believer in the doctrine of Signatures, a philosophy that linked the physical attributes of plants to their possible medical uses. Perhaps more famously though, he introduced the use of chemical drugs in place of herbal remedies and began to use of calomel (mercury). This was to pave the way to the age of ‘heroic medicine’ at the end of the 16th century.

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History of Herbal Medicine in Britain, The Herb Society
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Wikipedia: The Renaissance, Elizabethan Britain

Clinical Pearl: Progressive Retinal Atrophy

Dr Steve Marsden: College Forum

For progressive retinal detachment consider Ming Mu Di Huang Wan, which has a Qi moving aspect and it is also cooling. I also like XFZYT. Lastly, I’ve used Xian Fang Huo Ming Yin in people with retinal degeneration, with success.

Wynn, S.G & Fougere, B.J (2007) Veterinary Herbal Medicine, Mosby Elsevier

Research Abstracts:

Zeel for news? Thyme for milk, garlic flavoured eggs and is that red wine with your chicken? Gold for Dogs?

This is an abstract on research on Phyto-Mast...
chemicakls, which may have different pharmacokinetic behaviors. Further analysis and additional study animals will help to determine a milk withholding time for Phyto-Mast. Given the recent growth of the organic dairy industry, understanding the pharmacokinetics of therapeutics used in organic production and developing accurate withholding recommendations will help to ensure milk safety. 

Olobatoke RY, Mulugeta SD. 


Abstract

This study was conducted to investigate the potential of garlic powder (GP) in improving production efficiency, egg quality and gut health of laying hens. A total of seventy-two 30-wk-old Dekalb white strain hens were used. The live weight of the hens ranged between 1.71 and 2.12 kg. Hens were randomly allotted into 3 dietary treatment groups in a complete randomized design experiment. The 3 dietary treatments were control (no garlic addition) and 3 and 5% GP additions to a basal diet on weight:weight ratio basis. Egg production and feed consumption were recorded daily, and hen BW and internal quality of fresh eggs were assessed weekly. Fecal samples were assessed for total bacterial load. The results from this study revealed significant (P < 0.05) increases of 0.81 mm in albumen height and 2.71 Haugh units of fresh eggs at 3% GP addition. Egg and albumen weights increased significantly (P < 0.05) by 2.06 and 1.84 g, respectively, at 5% GP over the control treatment. Egg production decreased significantly at 5% GP following a decrease in feed consumption. Similarly, log bacterial count in feces showed a dose-dependent reduction as dietary GP increased. Organoleptic evaluation of eggs from treatment birds revealed a strong garlic flavor in eggs from 5% GP group compared with the control and 3% GP groups. Results of this study suggest that dietary GP improved egg weight and albumen quality with a strong garlic flavor at high dietary levels.


Abstract

Grapes have high amounts of phenolic compounds, which can modulate the gut activity as well as modify the structure and function of the gastrointestinal tract. The microbiological activity of avoparcin, grape pomace concentrate, and grape seed extract was evaluated in an in vitro study. An in vivo experiment was also conducted to study the effect of the inclusion of grape pomace concentrate and grape seed extract in the diet of broiler chicks on performance, intestinal microflora (by cultured and terminal restriction fragment length polymorphism methodology), and gut morphology at 21 d of age. Dietary treatments included an antibiotic-free diet (CON), a positive control (AVP; 50 mg/kg of avoparcin), and antibiotic-free diets containing grape pomace concentrate (GPC; 60 g/kg) or grape seed extract (GSE; 7.2 g/kg). Performance was not affected by dietary treatment except in the case of birds fed the GSE diet, which showed decreased weight gain. In the ileal content, birds fed CON and GSE diets had the highest populations of Lactobacillus. Compared with the CON diet, the AVP, GPC, and GSE diets increased the populations of Enterococcus and decreased the counts of Clostridium in the ileal content. In the cecal digesta, birds fed GPC and GSE diets had higher populations of Escherichia coli, Lactobacillus, Enterococcus, and Clostridium than birds in any other treatment group. Animals fed GPC and GSE diets showed a higher biodiversity degree than those fed control diets. The frequency of detection of several potential phenol-degrading bacteria as well as unidentified and uncultured organisms was increased in animals fed GPC and GSE diets. Birds fed the CON diet had longer villi and deeper crypt depth than birds in any other treatment group. The highest villi height: crypt depth ratio corresponded to birds fed GPC and AVP diets and the lowest to those fed CON and GSE diets. In conclusion, dietary polyphenol-rich grape products
modify the gut morphology and intestinal microflora and increase the biodiversity degree of intestinal bacteria in broiler chicks.


**Abstract**
The authors compared the symptomatic effectiveness of a complex homeopathic preparation Zeel (1-3 tablets orally per day depending on body weight) to carprofen (4 mg/kg body weight) in dogs (n=68) aged >1 yr diagnosed with osteoarthritis in a multicenter, prospective, observational open-label cohort study in 12 German veterinary clinics. The active treatment period was 56 days. Symptomatic effectiveness, lameness, stiffness of movements, and pain on palpation were evaluated by treating veterinarians and owners. Clinical signs of osteoarthritis improved significantly (P<0.05) at all time points (days 1, 28, and 56) with both therapies. At the end of the treatment period, effectiveness was comparable in both groups. Both treatment regimens were well tolerated with only three treatment-related adverse events, all in the carprofen group.


**Abstract**
Inflammatory changes associated with periarticular pure gold bead implants were studied in dogs involved in a clinical trial investigating motor dysfunction and chronic pain owing to hip joint dysplasia and osteoarthritis. Gold beads were percutaneously implanted via a needle into different locations surrounding the greater trochanter of the femur. Nine dogs with implants were necropsied. In all examined animals, characteristic histologic lesions were observed in the tissue surrounding the gold implants—namely, a fibrous capsule composed of concentric fibroblasts intermixed with a variable number of inflammatory cells and a paucicellular innermost layer of collagen with a few fibrocyte-like cells in empty lacunae. Lymphocytes dominated the inflammatory infiltrate, with rarely observed macrophages present in close proximity to the implant site. No giant cells were observed. Immunohistochemistry showed mixed populations of lymphocytes, both CD3 positive (T cells) and CD79a positive (B cells), which in some cases formed lymphoid follicles. Diffuse inflammatory changes were present to a minor extent in the perimysium and surrounding fascia. The inflammation observed in dogs is similar to that observed with gold implants in humans. It is possible that the clinically beneficial effect of gold beads for chronic osteoarthritis depends on sustained localized inflammation with localized release of soluble mediators. The encapsulation of the implant by a paucicellular and poorly vascularized fibrous capsule may help prevent an exaggerated inflammatory reaction by sequestering the gold bead from the surrounding tissue.

**Literature review:**

**Cholesterol and Triglyceride Lowering Herbs**

**Dr Kris August DVM**

In humans, high cholesterol levels are of great concern due to the development of arteriosclerosis, which often leads to severe cardiovascular disease. Dogs and cats have not been found to develop arteriosclerosis as commonly as humans with high cholesterol, and the effects on the cardiovascular system are not recognized as they are in humans, however, chronic hyperlipidemia, resulting in the deposition of lipid and lipoprotein complexes throughout the body, has the potential effects in cats and dogs of gastrointestinal signs such as anorexia, vomiting and diarrhea, hepatic lipidosis, and acute
necrotizing pancreatitis with abdominal pain. Other adverse effects of hyperlipidemia include, ocular changes including lipid keratopathy, arcus lipoides, stromal dystrophy, lipid in the aqueous humor, uveitis, blindness and lipemia retinalis. Dermatological signs such as cutaneous xanthomata, pruritis and alopecia, also can occur, as well as central nervous system changes including seizures, behavioral and cognitive changes, neuropathies and cerebral atherosclerosis.

In dogs and cats, hyperlipidemia or lipemia describes an increase in serum lipids, primarily triglycerides and/or cholesterol. The blood sample often contains a visible milky serum, which indicates hypertriglyceridemia. Hypercholesterolemia alone does not produce this milky lipid seen in serum samples. In diagnostic work-ups it is important to rule out postprandial hyperlipidemia by fasting the patient for 12 -18 hours before blood sampling. High blood cholesterol and triglyceride levels in cats and dogs can be an indicator of a number of disorders that affect lipid metabolism, which can often be diagnosed with further testing, history and physical examination findings, these include hypothyroidism, diabetes mellitus, pancreatitis, hyperadrenocorticism, and protein losing nephropathy. Additionally, conditions such as inflammatory bowel disease and lymphosarcoma can lead to pancreatitis and therefore elevate blood lipids, and medications such as progestagens and corticosteroids can cause hyperlipidemia. Blood lipid concentrations often return to normal with control of the underlying disease.

There are, however, patients that continue to have highly elevated blood cholesterol and/or triglycerides without the diagnosis of causative illness. Repeated blood cholesterol levels over 500mg/dl and triglycerides persistently above 750mg/dl are generally of concern. These cases often appear to be familial, and in middle-aged miniature Schnauzers, an inherited lipoprotein lipase deficiency (idiopathic hyperlipidemia of Schnauzers), is the suspected cause. Other purebred and mixed-breed dogs have been reported with similar conditions, including beagles, Shetland sheepdogs, briards, rough coated collies and poodles. In cats, an inherited hyperchylomicronemia has been reported in New Zealand in which triglycerides and cholesterol are elevated. Clinical signs appear in these cats after 6-9 months of age, which include lipemia retinalis (often the only sign), some progress to having peripheral neuropathies, cutaneous xanthomas, and lipid granuloma formation in abdominal organs.

In these cases of chronic hyperlipidemia without identifiable causative disease, it is desirable to reduce the cholesterol and triglyceride levels to avoid the possible long term damage discussed above. Conventional methods of reducing lipemia generally consist of a high fiber, low fat prescription diet (less than 12% fat by dry-weight matter), exercise and weight loss programs, fish oil supplementation (omega 3 fatty acids may decrease the synthesis of VLDLs and LDLs), and the drugs Gemfibrozil (Lopid – a fibric acid derivative) and niacin (nicotinic acid), which decrease hepatic production of triglycerides and VLDLs. Niacin can cause some flushing of the skin and pruritis due to vasodilatory affects. Statin drugs are commonly used in people to reduce the production of cholesterol, but do not help against triglycerides that are often more of a problem in animals, in addition, statins can have a range of side effects including myopathy, cataract formation and hepatotoxicity. Chitosan (Chitin) a shellfish origin fiber supplement that binds lipids and decreases their absorption has also been suggested for use. Liver and pancreas support such as milk thistle and S-Adenosylmethionine (SAM-e) are also recommended in these cases, as they are prone to pancreatitis and hepatic lipidosis.

A literature review was conducted to identify herbs that would be safe and useful in lowering triglyceride and cholesterol levels in dogs and cats. Interestingly, the majority of the research on these herbal remedies was done in India and China, the countries of origin of two important traditional medicinal systems with extensive use of herbs. Several plants have been identified to possess hypolipidemic properties, these include garlic, globe artichoke, fenugreek, guggul, red yeast rice,
shiitake, hawthorn, yarrow, milk thistle, Panax
ginseng and notoginseng, artemesia, basil, turmeric,
red peppers, eggplant, stinging nettle, and others.
Guggul, fenugreek, red yeast rice and artichoke
have been used in many studies and have been
shown to reduce serum cholesterol in humans by
10% to 33%. For comparison, the conventionally
used statin drugs are known to reduce human
cholesterol levels by 20% to 30%.

A brief review of individual herbs having
hypolipidemic effects follows:

**Garlic (Allium sativum)**
One of the most well studied and
effective herbal remedies for
hyperlipidemia is garlic. It is
pungent and warm, known for its
antiplatelet, anticholesterolemic,
antiseptic, mucolytic and
vasodilatory properties. Allicin is one active
constituent of garlic, though there are many other
active components. One study was done to
determine if raw or boiled garlic had better
hypolipidemic and antioxidant effects in laboratory
rats fed a high fat diet, and both forms were found
to have significant benefits over the control rats that
received no garlic in their diet. There is a risk for
Heinz body anemia at higher doses in dogs and cats,
additional supplementation with antioxidants may
help protect against these side effects and
monitoring of red blood cell count and morphology
is recommended.

**Globe Artichoke (Cynara scolymus)**
Globe artichoke is a cooling
bitter tonic that is antiemetic,
diuretic, choleretic,
hepatoprotective, and
hypolipidemic. Like many of
these herbs, globe artichoke is
useful due to antioxidant properties as well as
hypolipidemic effects. Hyperlipidemia has an
oxidizing effect on cell tissues and this has been
shown to be reduced by artichoke leaf extract in the
heart and liver cells of rats with diet-induced
hyperlipidemia, while also reducing serum lipids.

Artichoke is used as a food and the main
contraindications are with biliary obstruction or
gallstones, or allergy to the Aster family.

**Fenugreek (Trigonella foenum-graecum)**
A common food in India and the Middle East,
fenugreek is a pungent, warm bitter used as an
alterative, carminative, demulcent, hypoglycemic,
hypolipidemic, laxative, nutritive, expectorant,
galactagogue, and topically as a vulnerary.
Fenugreek seeds are used as a ground powder in
some studies and an ethanol extract in others. They
have been shown to lower serum triglycerides, total
cholesterol, and low-density lipoprotein cholesterol.
These effects may be due to sapogenins, which
increase cholesterol excretion through the bile, as
well as an estrogenic constituent, which indirectly
increases thyroid hormone T4. Decreased
expression of adipogenic factors and upregulation of
LDL receptors were found to be the mechanisms in
one study. Ground fenugreek seeds were found to
reduce the size of gallstones in mice with dietary-
induced high cholesterol. Cholesterol was lowered
significantly, but triglyceride differences were
similar to mice returned to the base diet without
supplemental fenugreek.

**Guggul (Commiphora mukul)**
Guggul is an Indian herb that is
warming and bitter, astringent,
carmineative, diaphoretic, diuretic,
expectorant, alterative, stomachic,
sedative, hypolipidemic, and useful
for arthritis, and sore muscles as
well. It is useful for patients with cardiovascular
disease because of its hypolipidemic, antioxidant
and antiinflammatory effects. Guggulsterone, an
important constituents of guggul, has been found to
be an antagonist at the farnesoid x receptor, a key
transcriptional regulator for the maintenance of
cholesterol and bile acid homeostasis.

The most common side effect is diarrhea, with other
GI complaints such as flatulence and vomiting.
There is one human report of a 55-year-old man
with rhabdomyolysis and hemoglobinuria after 2 weeks on a guggul extract (dose: 300 mg 3 times daily) for cholesterol lowering purposes. This is a side effect generally seen with statin drugs, but it reminds us that these patients should be monitored regularly. Blood results in this patient showed an increase in creatinine kinase, myoglobin, lactate dehydrogenase, aspartate aminotransferase (AST), and alanine aminotransferase. All laboratory parameters returned to normal after discontinuation of the herbal treatment.

There are conflicting study results on guggul with some citing significant hypolipidemic effects and others not supporting this. Further study is needed to determine consistent and useful preparation and dosing.

**Red Yeast Rice (Monascus purpureus rice)**
The original source of statin drugs, used to treat hypercholesterolemia in humans, are monacolins, constituents of red yeast rice (rice fermented with the yeast, Monascus purpureus). They act as inhibitors of HMG-CoA reductase, which is important in cholesterol synthesis. Along with the many monacolin constituents, red yeast rice also contains fatty acids, palmitic acid, linoleic acid, oleic acid, and stearic acid, which may assist in reducing blood lipid levels along with having antioxidant effects. In a long-term study (200 days), red yeast rice was found to reduce serum cholesterol and triglycerides as well as protect against atherosclerosis in rabbit test subjects. As with the isolated and concentrated statin compounds, there have been a few cases of rhabdomyolysis at high doses of red yeast rice in combo with other hypolipidemic drugs, specifically gemfibrozil.

**Hawthorn (Crataegus spp.)**
A powder of hawthorn berries (Crataegus pinnatifida) reduced serum cholesterol and triglyceride levels in laboratory rabbits by 23% and 22% respectively over a 12-week period of time. Intestinal acyl CoA:cholesterol acyltransferase (ACAT) activity was suppressed suggesting that cholesterol absorption was inhibited by the down-regulation of intestinal ACAT activity. Other benefits of hawthorn have been described, including cardiotonic, diuretic and astringent activity. Only the Asian species of hawthorn have been shown to have cholesterol-lowering effects. Hawthorn constituents include sapogenins and flavonoids.

**Yarrow (Achillea wilhelmsii)**
Yarrow is well known for many medicinal properties including its use as a diaphoretic, antipyretic, peripheral vasodilator, anti-inflammatory, spasmylytic, bitter tonic, antimicrobial, anti-hemorrhagic, hemostatic, and vulnerary. It contains flavonoids and sesquiterpene lactones that have been shown to have lipid and blood pressure lowering effects. A double-blind placebo study in humans given a hydroalcoholic extract of Achillea over a 6-month period showed a significant decrease in triglycerides after 2 months, and significant decreases in triglycerides, total cholesterol and LDL-cholesterol after 4 months. After 6 months, levels of HDL-cholesterol were significantly increased and blood pressure reduction was also noted.

**Mushrooms**
Maitake, shiitake and enokitake mushroom fibers were found to reduce the absorption of cholesterol in rats significantly compared to cellulose fiber indicating antilipidemic activity beyond physical interference with absorption. Further study is needed to determine the specific pathways of action, though these fungi have many beneficial medicinal properties. Shiitake specifically has immune enhancing properties, is anti-neoplastic, antifungal, antibacterial, antiviral, and is used to treat respiratory diseases such as colds and flus as well as bronchial inflammation, heart disease, hypertension, diabetes, hepatitis, as well as hyperlipidemia.

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Milk Thistle (*Silybum marianum*)
Well known for its hepatoprotective and antioxidant effects, milk thistle and silymarin, an active constituent, has also been found to have hypolipidemic effects in laboratory rats and rabbits. One possible mechanism found in vitro is that silybin inhibits liver HMG-CoA reductase activity\(^\text{20}\).

Panax Ginseng (*Panax Ginseng*)
Also known as Korean or red ginseng, Panax ginseng is used as an adaptogen, stimulant, tonic, thymoleptic, hypoglycemic, immune stimulant, hepatoprotective, cardioprotective, antiarrhythmic, and increases adrenocorticotropic hormone (ACTH)\(^\text{5}\). It has been shown to have hypolipidemic and antioxidant effects in humans. A study in rats with hyperlipidemia acutely induced by Triton WR1339 or corn oil injected intravenously, showed that an isolated constituent, red ginseng acidic polysaccharide, significantly decreased serum triglycerides, but not cholesterol. It also increased the activity of lipoprotein lipase, a key hydrolytic enzyme of lipid molecules\(^\text{21}\).

Panax notoginseng
The roots of the herb Panax notoginseng are used to prepare the traditional Chinese medicine, Sanchi, also known as Radix Notoginseng, which is traditionally used primarily as a hemostatic to control internal and external bleeding, but also has been found to increase coronary blood flow and reduce myocardial oxygen consumption and blood pressure. A study in laboratory rats fed a high cholesterol diet showed a significant decline in serum levels of total cholesterol, triglycerides and low density lipoprotein-cholesterol, with an increase in serum high-density lipoprotein-cholesterol levels. Reduced levels of hepatic HMG-CoA reductase and improved hepatic superoxide dismutase and glutathione peroxidase activities were found as well as reduced levels of lipid peroxidation, demonstrating hypolipidemic and antioxidant effects for this herb as well\(^\text{22}\).

Artemesia (*Artemisia aucheri*)
A study in rabbits fed a high cholesterol diet and supplemented with Artemisia aucheri, showed a significant reduction of total cholesterol, LDL cholesterol and triglycerides and increased HDL cholesterol along with a significant reduction in atherosclerotic thickness of the aorta\(^\text{23}\). Active constituents in Artemesia include sesquiterpene lactones and flavonoids.

Basil (*Ocimum basilicum*)
A study in 2006 found that an aqueous extract (tea) of sweet basil lowered plasma cholesterol, triglycerides and LDL-cholesterol significantly more than the hypolipidemic drug fenofibrate in rats with Triton WR-1339-induced hyperlipidemia. It also showed very high antioxidant effects and should be considered in the treatment of hyperlipidemia\(^\text{24}\).

Turmeric (*Curcuma longa*) and Red Pepper (*Capsicum annuum*)
Turmeric is another valuable spice with multiple medicinal properties including anti-inflammatory, antioxidant, anti-platelet, cholagogue, hepatoprotective, anti-neoplastic, and anticholesterolemic. A recent study using its constituent curcumin, which is thought to be the most active component, tested for additive effects with capsaicin, an active constituent in red peppers, found little additive effect of the two combined, but still indicated significant hypolipidemic effects for each alone as well as together\(^\text{25}\). The two spices are used in combination in many dishes and perhaps the use of them in their whole form would have given different results?
Eggplant (*Solanum melongena*)
A study in rats used flavonoids isolated from eggplant (called brinjal in India) to show a significant reduction of triglycerides and cholesterol levels in serum and tissues (liver, aorta and heart). HMG CoA reductase activity was increased along with lipoprotein lipase and activity for glucose6phosphate dehydrogenase and malate dehydrogenase was reduced\(^26\).

Erica Flowers (*Erica multiflora*)
Erica flowers are traditionally used for their diuretic and antiseptic properties and have also been found to have anti-inflammatory as well as hypolipidemic and anti-atherosclerotic activity. Their major constituents include tannins, proanthocyanidols and flavonoids. This study in Morocco used wild harvested flowers, verified by a botanist and extracted in water similar to the traditional methods. This extraction was given to laboratory rats with artificially elevated lipidemia induced by Triton WR-1339. Plasma triglycerides and cholesterol levels were significantly lowered and the mechanism is theorized to be similar to other plants with similar constituents that have been shown to stimulate the lipolytic activity of plasma lipoprotein lipase\(^27\).

Yerba Mate (*Ilex paraguariensis*)
Yerba Mate, used as a stimulatory tea in South America, has confirmed antioxidant, anti-inflammatory, vaso-dilating, antimutagenic, lipid-lowering and weight-reducing activities. Ilex paraguariensis extracts are capable of inhibiting pancreatic lipase activity in vitro and have been shown to reduce cholesterol as well as the size of aortic lesions in rabbits fed a cholesterol-enriched diet\(^28\).

Goathead (*Tribulus terrestris*)
Used in Chinese, Ayurvedic and other traditional herbal systems, Tribulus terrestris goes by many names, bai ji li (TCM), gokshura/ sarrata (Ayurveda), and the noxious weed ‘goathead’. It has been used for many purposes including treatment of disorders of the skin and liver, diabetes, cardiovascular disorders including hypertension, hyperlipidemia and coronary heart diseases, nephrotoxicity, nephrolithiasis and diuresis, fungal infections, aphrodisiac and sexual dysfunction. A study in 2008 showed an extract of Tribulus terrestris given to rabbits on a high cholesterol diet significantly reduced serum cholesterol and triglyceride levels while also showing some beneficial endothelial cell repair. The lipid levels did not reach those of the control group on a standard diet, though this herb may work well in combination with other hypolipidemic treatments\(^29\).

Stinging Nettle (*Urtica dioica*)
An ethanol tincture of *Urtica dioica* was shown to reduce blood cholesterol in rats along with being hepatoprotective\(^30\).

Hibiscus (*Hibiscus sabdariffa*)
An extract of the medicinal herb, *Hibiscus sabdariffa*, was found to inhibit serum lipids and have an antiatherosclerotic effect in rabbits\(^31\).

Coconut water (*Cocos nucifera*)
Coconut water was compared to lovastatin and found to have similar effects in reducing serum total cholesterol, VLDL + LDL cholesterol, and triglycerides. The coconut water decreased activities of hepatic lipogenic enzymes and increased HMG CoA reductase and lipoprotein lipase activity\(^32\).

Other isolated compounds:
In addition to the studies found on individual plants, many studies were conducted using isolated compounds from plants to determine their
hypolipidemic effects. Berberine, an alkaloid originally isolated from huanglian (Coptis chinensis), has been found to lower cholesterol, triglycerides and LDL-c in humans and hamsters. Daphnetoxin and Gniditrin are compounds isolated from the root bark of Daphne giralldii Nitsche (Cirald Daphne bark), a traditional Chinese herb known to have analgesic, anti-inflammatory, antibacterial, antithrombus, antineoplastic as well as antifertility properties. These compounds have been found to up-regulate expression of LDLR in vitro, exhibiting potential cholesterol lowering effects. Though these studies are likely conducted with the goal of manufacturing new pharmaceuticals, it would be useful to study the effects of the whole plant used for lipid lowering purposes as plants often have multiple constituents that work synergistically to reach their effect, often with less toxicity than isolated constituents alone. It may take a higher dose, or longer time for the effect to be realized using the whole plant, but the safety and synergism should be taken into consideration.

Conclusion
With hyperlipidemia being so closely tied to cardiovascular disease in humans, there is much interest in exploring the hypolipidemic properties of traditional herbal remedies and culinary herbs, especially in countries where a majority of the population still uses traditional medicines and the expense of modern pharmaceuticals often makes conventional treatment unobtainable. This preliminary research is proving to be useful to both human and animal patients. Clearly there are many plant options to support the treatment of hyperlipidemia, some have been found to be more effective than others, and some may have side effects of concern. Many have no or minimal known side effects and are certainly worth adding to the treatment regimen of diet and exercise for hyperlipidemia and should be considered before adding in more potentially harmful medications such as niacin and statin drugs. Many of these herbs are commonly used in cooking as well as traditional herbal medicine, which supports their relative safety, though individual herbs should still be reviewed for current information prior to prescribing and species differences in sensitivity should be taken into consideration.

While there appears to be a plethora of articles and research on herbal remedies, the usable information is still limited by a lack of consistency in preparations used, herbal quality, dosing, and assessment parameters. Most of the studies were done in laboratory animals artificially induced with hyperlipidemia through diet or other means, and were conducted over short periods of time, leaving questions about efficacy in “real world” patients. Given this list, the possibilities for combined effects using plants that reduce blood lipids by different mechanisms are quite numerous. There is an observable similarity found in many of the constituents of these herbs – flavonoids, sapogenins, and sesquiterpene lactones are seen frequently and antioxidant activity paired with hypolipidemic effects are a common theme which may be helpful in making herbal prescriptions. This review gives a good starting point and many options that can be incorporated and combined in dietary therapy for hyperlipidemic patients as well as herbal medicines. Further studies and case documentations are needed to improve prescribing strategies.

References
Back to the Source: A Vet's Visit to China

Dr Steve Marsden  DVM ND MSOM LAc DiplCH RH (AGH)

An intrepid group of veterinary acupuncturists, their spouses and one brave teenager journeyed with CIVT Faculty member Steve Marsden and his family to Southern China in April, spending the better part of a week steeped in the traditions of classical Chinese medicine, as interpreted by one of China’s most noted scholars and physicians, Dr Liu Li Hong.

Here's an excerpt from Steve's blog.

During the first part of the trip, after touring the Guangxi College of Traditional Chinese Medicine, we were the honoured guests of the 11th century Zen Buddhist monastery nestled below the vaulting cliffs of Mount Bai Shi (‘White Rock’), southeast of Nanning. Nearby was a small rustic village, where we got up close and personal with life in rural China.

Our five days in the temple were spent basking in the wisdom of Dr Liu Li Hong (pictured, above). Dr Liu is one of the foremost authorities in Chinese medicine in China today, and served as personal physician to the late Rimpoche Kenpu Jikhpun, head of the Ningma sect of Tibetan Buddhism (regarded by the Tibetans as one of the reincarnations of Manjushri, the Buddha of Wisdom). Today, he serves as a senior professor at Guangxi College of Traditional Chinese Medicine and is the author of the recent bestselling work in China, Sikao ZhongYi (Rethinking Chinese Medicine), an interpretation of the classic Shang Han Lun (Treatise on Cold Febrile Disease), where some of our most important herbal formulas were first published. In addition to a day spent on the Shang Han Lun, Dr Liu spent time discussing the revitalization of an old theory that is gaining new traction amongst Chinese medical scholars, namely the need to begin addressing medical disorders by first harmonizing the emotions. There followed some lively evening discussion how we might apply those ideas to animals.

Each afternoon, we had a chance to stretch our legs in the countryside surrounding the temple. Nearby were a series of sacred grottos where Ge Hong, the great 2nd century herbalist and founder of Daoism, retreated from society to receive enlightenment. Very few westerners are permitted to see this region, given its historic and cultural importance. The area is even closed to Chinese tourism, save for all but friends of the temple.

It was logical for a group of veterinarians and their families to visit this region. Ge Hong was, after all, one of the first practitioners to apply Chinese medicine to animals, and wrote a treatise on their acute care using acupuncture and herbs. The water from the spring inside the main cave where Ge Hong lived is said to have magical healing properties. Everyone drank heartily and then marvelled at the intricacies of the Daoist temple that has been built over the cave entrance.
On the last night at the temple, we had an impromptu talent show where tour participants and their hosts took turns regaling each other with songs and skits, in Chinese and in English. By the time it was over, our sides ached with laughter and we’d been introduced to songs spanning the globe, from China, to Canada, to Australia.

After several days at the monastery, we journeyed to Yang Shuo, an impossibly scenic area of gentle rivers and soaring limestone peaks. After mornings spent learning about the arts of Feng Shui, landscape painting and the savouring of Chinese tea, we spent the afternoons on raft trips and strolling marketplaces both ancient and modern.

Finally, the time came to part ways, with most going on to spend a few days taking in the sites of Beijing before jetting off to the United States, the Netherlands, Canada and Australia. The participants are grateful to Heiner Fruehauf, one of Dr Steve’s principal teachers, for putting up with Steve’s hundreds of emails and liaising with Dr Liu to organize most of the trip; to Vikki Weber of IVAS for organizing the Bei Jing leg, advertising the trip and registering the participants; to Dr Liu for his valuable time; and to Qu Yan, our tireless interpreter.

I am also grateful to everyone who came on the trip with myself and my family. The trip had its rustic and challenging moments, but not once did anyone stop smiling. Thank you for representing your countries so well.

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The Journal of the College of Integrative Veterinary Therapies (JCIVT) is the first international veterinary publication addressing evidence based natural medicine for animals.

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