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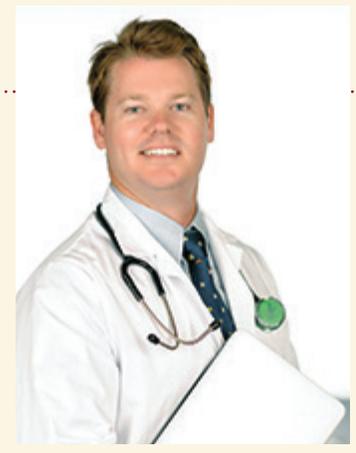


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Keys to Evaluating Forelimb Lameness in Juvenile Dogs

Matthew J. Morgan, DVM
Department of Surgery



Juvenile forelimb lameness cases can be challenging and frustrating for many veterinarians. There are numerous differential diagnoses, but when you're looking for "horses rather than zebras," the list becomes much shorter. This article will address key steps to consider during your initial evaluation as well as four common disease processes you will likely come across.

There are several key steps that we consider during the initial presentation. The first and often overlooked step is to take into account the dog's breed and age when developing our differential diagnosis list. Next consider onset and duration of clinical signs. Was this an acute lameness or a more gradual onset? Observe the dog's gait and attempt to characterize the lameness. Observe the animal's gait at a walk and run. Palpate the limbs in standing (weight-bearing allows for better assessment of joint effusion) and recumbent positions. Is the patient offloading when standing? Remember the old phrase "down on sound" when evaluating the patient moving toward you. For patients with a mild forelimb lameness I have found that video recording a patient in slow motion can be a big help when looking for a subtle head bob. Next perform a thorough

orthopedic exam in both standing and lateral recumbency to localize the lameness. It is common for puppies, especially in an excited state, not to react to a painful stimulus on palpation. Evaluation of the patient's gait after holding a joint (carpus, elbow, shoulder) in flexion for 20-30 seconds can help with localization.

This article will address key steps to consider during your initial evaluation as well as four common disease processes you will likely come across.

Following a good orthopedic examination, obtain an orthogonal radiographic view of the bone or joint localized. For good quality orthopedic radiographs patients usually need to be sedated for proper positioning. It is a good idea to obtain radiographs of both limbs for comparison and to help identify subtle changes.

Following a good history, thorough orthopedic examination and properly positioned

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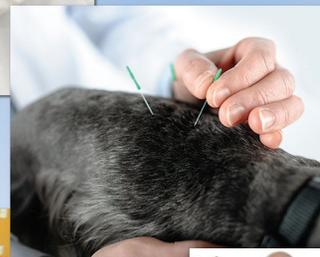
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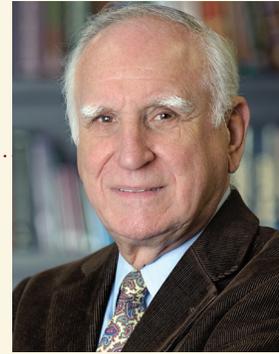


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A Note from the Editor



At Long Island Veterinary Specialists, we enter our 21st year with a referral center that has grown from an eight thousand square foot facility to one more than twice that size and from 20 employees to almost ten times that many. We are still the only veterinary facility in our area to house a 3 Tesla MRI to complement our spiral 3 dimensional CT scanner, our digital radiography system and thermography suite. These innovations in pet care diagnostics and treatment permit us to remain in the forefront of cutting edge veterinary care locally, nationally and worldwide. Staff members at LIVS continue to lecture nationally and internationally bringing news of these innovations to a broad audience of veterinarians. The innovative care and publications that have come from LIVS are testament to the energy and enthusiasm of our staff. LIVS continues to be the focus of more successful standard, mini, micro and nano total hip replacement procedures than any veterinary facility in the world. It is with personal pride that this editor, who in Super Bowl numbers has reached LXXXVI years, has served as surgical assistant to the chief of staff at LIVS in 600 total hip replacement procedures of the over two thousand he has performed.



LIVS' dedication to veterinary medicine and research fostered another first at LIVS, which was the premier issue of a new newsletter known as "LIVS in PlainView," first distributed to the veterinary community eleven years ago, starting in January 2008. We are changing the format and timing of our publication so that it will consist of more articles and veterinary content but will be issued on a bi-monthly basis, hence this Jan-Feb 2019 edition.

We will continue to feature articles that will originate from LIVS personnel on continuing education topics as well as dedicated columns featuring items of interest to practicing veterinarians. Currently at LIVS, a new study on refractory epilepsy is being initiated employing "tractography," a technique about which information will soon be sent to the veterinary community for participation, involvement and referral.

Dr. Curtis Dewey, associate professor and section head of Neurology/Neurosurgery at the College of Veterinary Medicine, is here at LIVS regularly for neurological consultation.

Our Integrative Medicine Department directed by Dr. Michael Selmer, who is only one of a few practitioners of Traditional Chinese Veterinary Medicine worldwide holding a masters degree in that discipline, holds hours regularly at LIVS and can be reached by calling (516) 501-1700.

On another non-veterinary topic, here is a thousand year old commentary by a Persian Sufi Mystic

"When you know, and know that you know, then you are wise. We will follow you.

When you know not, and know that you know not, then you are Scholars. Let us teach you.

But when you know not, and know not that you know not, then you are Fools, to be abandoned.

And when you know, yet know not that that you know, then are you a Poet, and honour is yours!"

A less ancient comment by a noted American writer/journalist seemed to capture the sentiment of the times when written a hundred or so years ago and is so applicable even now:

"Under democracy one party always devotes its chief energies to trying to prove that the other party is unfit to rule — and both commonly succeed, and are right."

— H.L. Mencken

We hope the New Year brings to our loved ones, our families and pets a brighter 2019.

Again, we welcome your comments e-mailed to lmarino@livs.org

Leonard J. Marino, MD, FAAP, LVT

Keys to Evaluating Forelimb Lameness in Juvenile Dogs

► Continued from Front Cover

radiographs, your differential list should be getting shorter and shorter. In the next section I will go over the four most common juvenile forelimb lameness conditions seen.

Panosteitis

Lameness localized to the limb in general could be panosteitis, which affects the long bones of large- and giant-breed dogs at 5 to 18 months of age. It results in acute lameness and pain on palpation of the long bones. Its cause is largely unknown.

Panosteitis is characterized by endosteal new-bone formation, giving affected long bones the radiographic appearance of an increased and blotchy density of the medullary canal. The condition can affect multiple bones concurrently or sequentially. Treatment includes supportive care, analgesics and time. Panosteitis tends to be self-limiting but can recur, although it is unlikely to do so in the same limb.

Hypertrophic osteodystrophy

Localization to the distal metaphysis of the long bone in large- and giant-breed dogs that are 3 to 5 months old should lead you to consider hypertrophic osteodystrophy (HOD), an uncommon disease of unknown etiology characterized by marked necrosis, inflammation and hemorrhage in the metaphysis adjacent to the physis. These changes lead to the radiographic appearance of a pseudo or double physis seen at the distal aspect of the long bones and are pathognomonic for HOD.

Affected dogs exhibit acute onset of swelling over the distal limbs, severe pain, anorexia and fever. The standard treatment for HOD includes supportive care, nutritional support and analgesics. Peracute and severe cases may benefit from a short course of corticosteroids. Antibiotics may be used to treat secondary infections (a specific infectious cause for HOD has not been identified, nor has a specific pathogen been isolated in these cases). Mild cases often spontaneously resolve. HOD is a

self-limiting disease, and recurrence is rare.

Keep in mind that, as with panosteitis, it is unlikely HOD will recur in a single limb. So if recurrent single-limb lameness is noted in a young dog, further evaluation for other possible causes of the lameness is warranted.

Elbow dysplasia

Lameness localized to the elbow joint is usually the result of elbow dysplasia. The term dysplasia is used to define osteoarthritis of the elbow resulting from one or more of the following: incongruence, ununited anconeal process, fragmented coronoid process or osteochondritis dissecans (OCD) of the humeral condyle. Elbow dysplasia is a polygenetic heritable disease in which one proposed pathogenesis includes incomplete ossification or bony fusion of the anconeus or medial coronoid process to the rest of the ulna. Premature distal antebrachial growth plate closure also can lead to joint incongruence and abnormal wear on articular surfaces.

Elbow dysplasia is common in Rottweilers, Bernese mountain dogs, German shepherds, Labrador and golden retrievers and Newfoundlands 5 to 10 months old. Signs include intermittent or persistent weight-bearing forelimb lameness, a head-bobbing gait, decreased range of motion and joint effusion. Affected dogs often have an elbows-out stance. Most dysplastic dogs have bilateral disease. Radiography and computed tomography are used for diagnosis.

Treatment can be medical or surgical but often involves both. Medical management consists of weight control, controlled exercise and administration of NSAIDs, analgesics and chondroprotectives. Surgical management includes either open or arthroscopic exploration of the joint, removal of fragments and debridement of fibrillated or malacic cartilage. It is imperative that surgical treatment be followed with good medical management.

All dogs with elbow dysplasia develop arthritis over time and eventually demonstrate

some degree of lameness. All will require medical arthritic management for their lifetimes. Surgery is most helpful when dogs are young and still growing and have minimal or no arthritis. Arthroscopy provides a minimally invasive means to explore the joint and treat several components of elbow dysplasia with generally greater success than conventional surgical techniques.

Osteochondritis dissecans

The most common cause of forelimb lameness localized to the shoulder is OCD, which results from a disturbance of articular or epiphyseal cartilage growth characterized by slow ossification of deep zone cartilage, leading to thickened, poorly nourished articular cartilage susceptible to trauma experienced with normal weight-bearing. A dissection lesion develops between the subchondral bone and articular cartilage, resulting in the characteristic flap.

OCD affects large-breed dogs, including Labradors and Golden retrievers, Rottweilers, Saint Bernards, German shepherds and Bernese mountain dogs, that are 5 to 10 months old. Most dogs with shoulder OCD have bilateral disease. Signs include forelimb lameness, adduction of the elbow, muscle atrophy over the scapula and pain with flexion and extension of the shoulder. The typical radiographic appearance is that of flattening and sclerosis of the caudal humeral head.

Treatment involves debridement of the cartilage flap and fragmented, malacic cartilage, followed by debridement of the lesion to the subchondral, bleeding bone via an open arthrotomy or arthroscopy. Arthroscopy provides a minimally invasive means to explore the entire shoulder joint, remove the cartilage flap and debride the cartilage defect with generally more rapid recovery than conventional surgical techniques. The prognosis for a dog with an appropriately treated shoulder OCD is good, and clinically significant osteoarthritis in the future is uncommon. □



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Therapeutic Results of Integrative Medicine Treatments Combining Traditional Chinese with Western Medicine: A Systematic Review and Meta-analysis

Michel Selmer DVM, MS-TCVM, Deng-Shan Shiao PhD

ABSTRACT

Western and Eastern medicine both offer unique perspectives fundamental to veterinary care today. The objective of this systematic review and meta-analysis is to summarize and analyze recent clinical research to answer the question: Can better therapeutic outcomes be achieved by integrating Traditional Chinese (Veterinary) Medicine (TCM/TCVM) with Conventional Western (Veterinary) Medicine (CWM/CWVM) rather than practicing CWM/CWVM alone. Publications were initially identified via internet search engines and were independently assessed to identify those that fit the inclusion/exclusion criteria. The conclusions of this systematic review were made based on the results of meta-analysis on the studies identified from the independent assessment. The initial literature search resulted in a total of 51 articles related to integrative medicine, and the result of the independent assessment found that 16 human clinical studies and 8 veterinary clinical studies were qualified for meta-analysis. In the analyzed human studies, the overall p -value was 3.18×10^{-27} , which supports the hypothesis that integrating TCM with CWM is a more effective treatment strategy than treating patients with CWM alone. In veterinary studies, the overall p -value was 9.59×10^{-10} , which also supports the hypothesis that, for veterinary patients, integrating TCVM with CWVM is a more effective treatment strategy than treating patients with CWVM alone. Based on the clinical study results reported in the literature to date in both human and veterinary patients, this systematic review and meta-analysis significantly demonstrates scientific evidence that integrating TCM/TCVM with CWM/CWVM would be a more effective treatment strategy than treating patients with just CWM/CWVM alone.

Key words: systematic review, meta-analysis, integrative medicine treatments, traditional Chinese medicine, conventional Western medicine

ABBREVIATIONS

TCM	Traditional Chinese medicine
TCVM	Traditional Chinese veterinary medicine
CWM	Conventional Western medicine
CWVM	Conventional Western veterinary medicine
SBM	Science based medicine
EBM	Evidence based medicine

Practiced on animals for nearly 3,000 years, TCVM is still a relatively new concept in the Western world. Like CWVM, TCVM also relies on review of complete medical history and physical examination to make a diagnosis or identify a pattern for determining

an effective treatment. Although similar, there are some fundamental differences: CWVM aims to achieve control of diseases or disorders, whereas TCVM tries to balance the body as a system; CWVM is more mechanical and Chinese medicine is more energetic; CWVM is good at “anti’s” (for example, using antibiotics when the patient has a bacterial infection), whereas TCVM is good at tonifying or bolstering, (for example, building blood in the anemic patient). Clinicians in CWVM analyze the process of a disease to uncover its specific pathogenesis, whereas TCVM clinicians recognize disease as an imbalance within the body, or between the body and the environment. In addition, CWVM studies functions of the body down to a cellular level to understand the pathophysiology of the disease, while TCVM considers the body as an energetic system in which all the body systems integrate and work together. As a result, Western medicine is effective at treating acute diseases and utilizes advanced diagnostics, surgical techniques and pharmaceuticals, whereas Chinese

From: Long Island Veterinary Specialists, Plainview, NY (Selmer), Chi Institute of Traditional Chinese Veterinary Medicine, Reddick, FL (Shiao, Ma, and Xie), Hebei University, Baoding, Hebei Province, China (Ma), University of Florida Veterinary Medical Center, Gainesville, FL (Xie)

medicine is focused on treating more chronic diseases. Despite these differences, the goals of both philosophies are similar in that they both strive to promote health and prevent disease.

There has been growing evidence that the strengths of Western medicine can also lead to its weaknesses, which can be mitigated by Chinese medicine and vice versa.¹ For example, when treating a cancer patient, chemotherapy is usually used in Western medicine to destroy cancer cells. In the process it can also cause debilitating, and sometimes life-threatening side effects. Chemotherapy can lead to anemia and lethargy, and studies have shown that Chinese herbal medicine can help build blood to resolve anemias and/or tonify *Qi* to reverse lethargy.¹

The purpose of this study was to achieve a greater understanding of how the integration of TCM/TCVM would affect therapeutic outcome when combined with conventional medical therapy. Study design included a systematic literature review which summarized scientific evidence from published well-designed studies and literature reviews evaluating therapeutic outcomes when integrating TCM/TCVM into a CWM/CWVM treatment plan. The hypothesis was that clinicians could achieve better therapeutic outcomes by integrating TCM/TCVM with CWM/CWVM.

MATERIALS AND METHODS

This systematic review considered all studies (human, veterinary) that involved the integration of TCM/TCVM with CWM/CWVM and the therapeutic outcomes achieved, regardless of the clinical problem. The review considered all English and Chinese to English translated randomized or non-randomized (client's decision unrelated to patient's condition) controlled studies evaluating and comparing the effectiveness or efficacy of the following: (1) TCM vs. CWM; (2) TCVM vs. CWVM; (3) TCM + CWM vs. CWM; and (4) TCVM + CWVM vs. CWVM.

The search strategy was designed to access published materials, which comprised the following three stages: (1) a search through PubMed, Google Scholar, Science Based Medicine (SBM), Evidence Based Medicine (EBM), and Medline to identify relevant keywords (Chinese medicine, acupuncture, herbal medicine, integrated medicine) contained in the title, abstract and subject descriptors; (2) terms identified and the synonyms used by respective databases were used in an extensive search of the literature; and (3) reference lists and bibliographies of the articles collected from those identified in stage two above were searched.

Articles identified from the initial search were assessed (independently by a co-author) for inclusion in meta-analysis based on the following criteria: (1) the article must contain a controlled clinical study; (2) there must be a comparison between integrative medicine and CWM/CWVM alone; (3) the study must report statistical significance (*p*-value) of the comparison.

Meta-analysis, a statistical procedure to combine

the results of independent but similar studies to obtain an overall estimate of the statistical significance, was conducted to test the hypothesis in this systematic review research. One convenient way to achieve this with sufficient robustness is to apply Stouffer's Z-score method.² The method first converts the *p*-value from each individual study to a Z score (inverse of normal cumulative distribution function) and then calculates an overall Z score by dividing the sum of all individual Z scores by the square root of number of studies. The overall significance (*p*-value) can then be derived from the normal cumulative distribution function. If the resulting overall *p*-value is less than 0.05, the meta-analysis will conclude that the studies reviewed support the study hypothesis: Treatments that integrate TCM/TCVM with Western medicine are more effective than Western medicine alone. R statistical software^b will be used for all descriptive and quantitative statistical analyses.

It is worth noting that many of the studies did not report exact *p*-values, only open interval such as "*p* < 0.01" or "*p* > 0.05". In order to conduct the meta-analysis, the study applied a conservative approach. For instance, when a study reported a *p*-value < 0.05, 0.05 was used in the meta-analysis. On the other hand, when a study reported a *p*-value > 0.05, 0.99 was used in the meta-analysis. This approach was applied throughout this systematic review.

RESULTS

The initial literature search using the methods described in the previous section resulted in a total of 51 articles related to integrative medicine of TCM/TCVM and CWM/CWVM. Among these articles, 15 were review articles that focused on the concept and history of integrated medicine and did not report results from specific clinical studies; 5 were systematic review studies; 12 reported clinical studies in humans that compared treatment outcomes between integrated medicine and Western medicine alone; 17 contained clinical veterinary studies comparing integrated medicine to Western medicine alone; and the remaining 2 were studies using experimental rats. From those 5 systematic review articles, 6 additional clinical studies (all in humans) were identified. A total of 57 articles, therefore, were included in the assessment for possible inclusion in the meta-analysis.

Based on the aforementioned inclusion criteria, the independent study assessment resulted in a total of 16 human and 8 veterinary clinical studies that qualified for meta-analysis. These studies included treatments for a variety of diseases/disorders: human studies included cancer treatment, unresectable hepatocellular carcinoma, depression, infection, nephritic diseases, severe acute respiratory syndrome; veterinary studies included mammary gland neoplasia, neurologic dysfunctions, pain and hypotension relief, paresis due to spinal cord injury, thoracolumbar intervertebral disk disease and ear infections (external bacterial otitis). These studies are listed in Table 1 and Table 2 for human and veterinary

Table 1: Summary of 16 human papers meeting meta-analysis inclusion requirements. There are 12 clinical studies and 4 systematic review studies. The total number of patients combined from these controlled trials was 10,360.

Authors (Year)	Clinical Diagnosis (TCM Treatment)	Study Design (# of Subjects)	p-value
Ye et al. ³ (1993)	Adult primary nephritic syndrome	Randomized controlled (134)	0.0004
Integrative Treatment	Chinese herbal medicine + reduced dosage of prednisone (various herbal ingredients at different treatment stages)		
Ye et al. ⁶ (1995)	Recurrent primary nephritic syndrome	Randomized controlled (62)	< 0.01
Integrative Treatment	Chinese herbal medicine + reduced dosage of prednisone (various herb ingredients at different treatment stages)		
Ye et al. ⁷ (1994)	Lupus nephritis	Randomized controlled (74)	0.0002
Integrative Treatment	Chinese herbal medicine + CTX shockwave therapy (lupus herbal formula combining with pattern differentiation)		
Xu and Ye ⁸ (1998)	Latent nephritis	Randomized controlled (45)	3.84×10 ⁻⁶
Integrative Treatment	Chinese herbal medicine + Dipyridamole (treatment for Liver and Kidney <i>Yin</i> Deficiency, <i>Qi</i> and <i>Yin</i> Deficiency, Spleen and Kidney <i>Qi</i> Deficiency, respectively)		
McCulloch et al. ⁴ (2006)	Non-small cell lung cancer	Randomized controlled (2,815 in 34 trials)	< 0.05
Integrative Treatment	Astragalus-based Chinese herbal medicine + platinum-based chemotherapy		
Jiao et al. ⁹ (2017)	Early stage non-small cell lung cancer	Randomized controlled (314)	> 0.05
Integrative Treatment	Chinese Herbal formulas based on TCM deficiency classification + adjuvant vinorelbine plus cisplatin/carboplatin (NP/NC)		
Shu et al. ¹⁰ (2005)	Hepatocellular Carcinoma	Randomized controlled (2,079 in 26 trials)	< 0.001
Integrative Treatment	Chinese herbal formula + chemotherapy drugs (various herb formulas in different studies)		
Lin et al. ¹¹ (2017)	Colorectal cancer	Randomized controlled (466)	< 0.01
Integrative Treatment	<i>Jianpi Jiedu</i> Formula + chemotherapy drugs		
Xu et al. ¹² (1989)	Nasopharyngeal carcinoma	Randomized controlled (188)	< 0.05
Integrative Treatment	“Destagnation” Chinese herbal medicine + Radiation treatment (<i>Huang Qi, Chi Shao, Chuan Xiong, Dang Gui, Tao Ren, Hong Hua, Ji Xue Teng, Ge Gen, Chen Pi, Dan Shen</i>)		
Yu et al. ¹³ (2009)	Unresectable hepatocellular carcinoma	Retrospective case controlled (165)	< 0.01
Integrative Treatment	Chinese herbal Jiedufan (JDF) granule preparation + Transcatheter arterial chemoembolization		
Meng et al. ¹⁴ (2008)	Unresectable hepatocellular carcinoma	Randomized controlled (2,653 in 37 trials)	< 0.05
Integrative Treatment	Chinese herbal formula + Transcatheter arterial chemoembolization (various herb formulas in different studies)		
Kou and Chen ¹⁵ (2012)	Depression	Randomized controlled (576 in 7 trials)	< 0.001
Integrative Treatment	Chinese herbal formula + Western medicine (various herbal formulas and Western medicines in different studies)		
Kong et al. ¹⁶ (1993)	Acute bronchitis	Randomized controlled (96)	< 0.01
Integrative Treatment	Chinese herbal medicine (<i>Shuang Huang Lian</i>) + Antibiotics		

Table 1 cont.

Authors (Year)	Clinical Diagnosis (TCM Treatment)	Study Design (# of Subjects)	p-value
Liu et al. ¹⁷ (2004)	SARS	Randomized or non-randomized case-control (524)	0.0004
Integrative Treatment	Chinese herbal medicine + glucocorticoid, antiviral drugs, antibiotics, immunomodulator (various prescriptions according to the symptom and stage)		
Wang et al. ¹⁸ (2004)	SARS	Randomized controlled (135)	0.014
Integrative Treatment	Chinese herbs + methylprednisolone, ribavirin, azithromycin <i>Guoyao 2</i> was administered during acute stage; <i>Guoyao 3</i> was used for critical stage; <i>Guoyao 4</i> patients with disease exceeding 3 wks/convalescent stage		
Chen et al. ¹⁹ (2013)	Hypertension with metabolic syndrome	Randomized controlled (43)	< 0.01
Integrative Treatment	Chinese herbal medicine (<i>Yiqi Huaju</i> Formula) + anti-hypertensive drugs		

Table 2: Summary of the 8 veterinary papers meeting meta-analysis inclusion requirements. The total number of subjects combined from these controlled trials was 184.

Authors (Year)	Clinical Diagnosis (TCVM Treatment)	Study Design (# of Subjects)	p-value
Wen and Johnston ⁵ (2011)	Canine mammary gland neoplasia	Non-controlled; compared with previous reports (8)	0.001
Integrative Treatment	Chinese herbal formula (<i>MammoSol</i>) + surgical excision or surgical excision in combination with chemotherapy		
Tsai et al. ²⁰ (2015)	Intervertebral disk disease	Randomized controlled (36)	< 0.05
Integrative Treatment	Bee venom (BV) injection at bilateral LI-4, SI-3, KID-3, ST-36, BL-23, BL-40, GB-30, GB-34, and LIV-3, unilateral GV-1, <i>Bai-hui</i> , and Ashi points + oral prednisone with NSAID carprofen, Ranitidine, Antibiotics		
Cassu et al. ²¹ (2014)	Sedation effect	Randomized controlled (12)	> 0.05
Integrative Treatment	Xylazine injected into the <i>Yin-tang</i> acupoint		
Zhang et al. ²² (2014)	Controlled hypotension	Randomized controlled (18)	< 0.05
Integrative Treatment	TENS stimulation applied at bilateral acupoints LI-4 (<i>He-gu</i>), ST-36 (<i>Zu-san-li</i>), SP-6 (<i>San-yin-jiao</i>), and LI-11 (<i>Qu-chi</i>) + Controlled hypotension		
Yang et al. ²³ (2003)	Spinal cord injury	Randomized controlled (20)	< 0.05
Integrative Treatment	Electroacupuncture treatment applied at GV-4 (<i>Ming-men</i>), GV-3 (<i>Yao-yang-uan</i>), BL-23 (<i>Shen-shu</i>), and BL-24 (<i>Qi-hai-shu</i>) as local points, and GB-30 (<i>Huan-tiao</i>), GB-34 (<i>Yang-ling-quan</i>), ST-36 (<i>Zu-san-li</i>), ST-40 (<i>Feng-long</i>), ST-41 (<i>Jie-xi</i>) as distal points + Corticosteroid treatment		
Hayashi et al. ²⁴ (2007)	Thoracolumbar intervertebral disk disease	Randomized controlled (50)	0.0015
Integrative Treatment	Electroacupuncture stimulation combined with standard Western medical treatment (oral prednisone/ranitidine/tramadol) <u>Acupuncture points:</u> SI-3; BL-62; BL-20; BL-23; ST-36; KID-3 transfixd with BL-60; GV-1; lumbar <i>Bai-hui</i> ; in some dogs LI-4 (instead of SI-3); BL-25 (instead of BL-20, as local point); and GB-30 (only for dogs with grade 1 and 2 dysfunction without severe paresis). GV-1 (instead of GB-30) was used in dogs with severe paresis or paralysis or urinary retention		

Laim et al. ²⁵ (2009)	Acute thoracolumbar disk disease	Randomized controlled (15)	0.018
Integrative Treatment	Electroacupuncture + conventional analgesics <u>Acupuncture points:</u> 2 points on the Bladder Meridian bilaterally rostral and caudal to the incision, ST-36 unilaterally, SP-6 unilaterally (contralateral to ST-36) and BL-60 bilaterally; GV-14 unilaterally, <i>Bai-hui</i> (lumbosacral site) unilaterally, BL-11 unilaterally, BL-40 unilaterally, GB-34 bilaterally, GB-30 unilaterally and LIV-3 unilaterally (contralateral to GB-30); 1 point from each body side was connected to 1 set as well as to GV-14 and <i>Bai-hui</i> (lumbosacral site)		
Sánchez-Araujo and Puchi ²⁶ (1997)	External bacterial otitis	Randomized controlled (25)	< 0.01
Integrative Treatment	Acupuncture + systemic antibiotic therapy <u>Acupuncture points:</u> TH-17 (<i>Yi-feng</i>), TH-21 (<i>Er-men</i>), SI-19 (<i>Ting-gong</i>), GB-20 (<i>Feng-chi</i>), LI-4 (<i>He-gu</i>)		

studies, respectively.

Based on the analysis with Stouffer's Z-score method on the reported *p*-values in Table 1, the overall *p*-value was 3.18×10^{-27} , which is approximate to 0 and thus strongly supports the hypothesis that integrating TCM with Western medicine is a more effective treatment strategy than treating patients with Western medicine alone. Similarly, based on the analysis with Stouffer's Z-score method on the reported *p*-values in Table 2, the overall *p*-value was 9.59×10^{-10} , which also strongly supports the hypothesis that, for veterinary patients, integrating TCVM with Western medicine is a more effective treatment strategy than treating patients with Western medicine alone.

DISCUSSION

Western and Eastern medicine both offer unique perspectives fundamental to veterinary care today. These two treatment philosophies were previously seen as being diametrically opposed, but as many have reported, these systems can complement each other.³ The results from this systematic review, based on the extensive search, review, and analysis on reported findings of controlled clinical trials suggest that in both human ($p=3.18 \times 10^{-27}$) and veterinary medicine ($p=9.59 \times 10^{-10}$) integrating Eastern and Western treatments of various diseases is more effective than using treatments from Western medicine alone and could also be more effective than treating with Eastern medicine alone (outside the scope of this research).

For example, in human lung cancer treatment, McCulloch et al. conducted a meta-analysis on randomized controlled trials that compared effectiveness between treatments combining platinum-based chemotherapies with astragalus-based Chinese herbal formulas against the control group with platinum-based chemotherapy alone.⁴ In a total of 34 studies that qualified for their meta-analysis, the results showed that the death rate was reduced (7 studies with total $n=529$, 6-month risk ratio (RR) = 0.58 with 95% C.I. = [0.48, 0.71]; 12 studies with total $n=940$, 12-month RR=0.67 with 95% C.I. = [0.52,

0.87]; 9 studies with total $n=768$, 24-month RR=0.73 with 95% C.I. = [0.62, 0.86]; and 6 studies with total $n=556$, 36-month RR=0.85 with 95% C.I. = [0.77, 0.94]), tumor response rates increased (30 studies with total $n=2472$, RR=1.34 with 95% C.I. = [1.24, 1.46]), and performance status increased (12 studies with total $N=1095$, RR=1.36 with 95% C.I. = [1.21, 1.54]). Since the 95% confidence intervals for none of the outcome measurements included 1.0, which would indicate non-significance, it was concluded from this systematic review that the integrated treatment under study was more effective than the treatment with the platinum-based chemotherapy alone (p -value < 0.05).

In veterinary medicine, a study on integrative cancer treatment was reported by Wen and Johnson.⁵ These authors reported a study with eight dogs with histologically confirmed mammary adenocarcinoma to determine if an herbal formula, MammoSol^a, a proprietary blend of 28 herbal ingredients, when combined with surgical excision could prolong survival times, in comparison with two previous reports in dogs having surgical excision alone or surgical excision in combination with chemotherapy. Two-year survival rate was significantly greater in the dogs that had surgical excision and MammoSol (7/8) as compared to previously published results of dogs that had surgery alone ($p=0.001$) and dogs with surgery and chemotherapy ($p=0.05$) using the discrete Bonferroni method. This study also showed that Chinese herbal therapy had fewer side effects and no dog exhibited adverse reactions. It was concluded, therefore, that MammoSol can be a safe and effective complimentary treatment for canine mammary gland cancers.

Despite the positive scientific evidence associated with integrative medicine, precautions must be taken in reading conclusions from this (or any other) systematic review and meta-analysis: (1) potential bias from the investigators in article selection and assessment processes would favor papers that support the study hypothesis, which highlights the importance of having independent

assessors with sufficient knowledge; and (2) studies with positive outcomes are more prevalent since studies with insignificance or negative outcomes would not get published.

Currently mainstream veterinarians are limited to the confines of CWVM and are not willing to consider the use of TCVM, even as a complementary treatment, due to the perception that there is lack of scientific evidence to support the claim that better therapeutic outcomes can be achieved by integrating Eastern and Western medicine. Despite the study limitations mentioned above, the results from this systematic review provide statistically significant evidence to support the study hypothesis. It is the ultimate goal that with the addition of this scientific evidence more pet owners will be willing to try integrative treatment for their animals, which will motivate more veterinarians to learn and practice integrative veterinary medicine.

FOOTNOTES

^a MammoSol, Natural Solutions Inc., Speonk, NY

^b The R Foundation for Statistical Computing; R version 3.4.1 <https://www.r-project.org>

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