



LONG ISLAND  
VETERINARY SPECIALISTS  
24 HOUR EMERGENCY ANIMAL CARE

Long Island Veterinary Specialists

# LIVS IN PLAIN VIEW



## Long Island Veterinary Specialists

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MARCH/APRIL 2023  
VOLUME 16 - ISSUE 2

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## Integrative Treatment of Dogs with Arthritis

Michel Selmer, DVM, MS, CTCVMP, CVMMP



Arthritis is a common problem in all dogs. Osteoarthritis, Degenerative Joint Diseases, Immune-Mediated Joint Diseases, Infectious Joint Diseases, Traumatic Joint Diseases, etc. are all to be considered. Some dogs, especially large breed dogs are more susceptible to arthritis (like hip dysplasia) due to genetic influences. But many dogs will develop arthritis for similar reasons we humans do. Besides genetics, overweight dogs are also predisposed to arthritis because of the trauma imposed by carrying all that extra weight over the years.

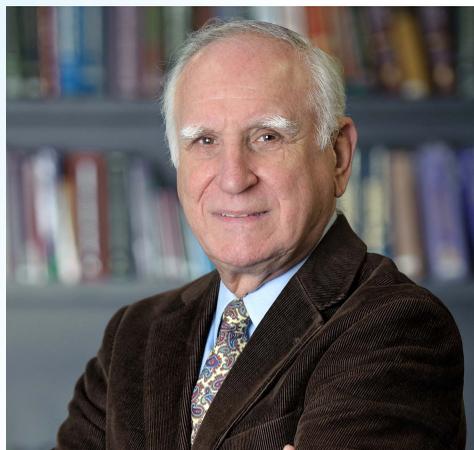
Diagnosing these diseases to find the etiology is extremely important and requires Western Conventional Diagnostics like laboratory testing,

imaging, joint fluid analysis, and cultures. Sometimes western conventional treatments for traumatic joint disease, medical and surgical, are indicated in the acute phase to help provide relief and to repair or replace a damaged joint. But, even post-surgical repair the dog will still have to heal and may benefit by integrating Traditional Chinese Veterinary Medicine and Veterinary Medical Manipulation. In the cases of immune mediated and chronic degenerative joint disease joint diseases conventional western therapies alone may fall short for long-term management whereas benefit by integrating Traditional Chinese Veterinary Medicine and Veterinary Medical Manipulation could be beneficial for an optimal outcome.

Conventional Western Veterinary Medicine truly provides the best options for diagnosing arthritis and treating arthritis in the acute phase. But, when there is chronic disease Conventional Western Veterinary Medicine may fall short to acquire the most desirable outcome and the patient may be left with unwanted and adverse side effects. Traditional Chinese Veterinary Medicine allows us to look at this disease from

*Continued on page 6*

# A NOTE FROM THE EDITOR



This has been the least snowy winter-to-date for the New York City area, the National Weather Service said. January was also the mildest on record for all climate sites, according to weather records. February, which is usually the snowiest month of the year in the region, had a number of days with temperatures in the 50s and 60s, and on Long Island, Islip had 0.7 inches of snow accumulation this season. Normally it measures an average of 21.3 inches for the period. Could the region still see snow? Back in March of 1888, there was a giant blizzard and about 20 inches of snow accumulated, but nothing approaching that event is on the horizon. We look forward to more and increasingly milder days.

On March 13, the new LIVS front entrance and waiting room was officially opened and the flow of admissions, both direct and through

the Emergency Department, was smooth, efficient and reassuringly pleasant. The staff has transitioned the admitting process from the rear entrance, dictated by COVID, to the front as before. It has been fully welcomed by clients, patients and staff.

Soon, outdoor graduation ceremonies and parties will begin, and grilling means our pets will be doing their usual begging for tasty bits of BBQ'd foods, most of which are hardly compatible with canine metabolic processes. Additionally, summer seems to bring on more accidents, rashes, accidental ingestions, gastrointestinal disruptions with subsequent dehydration and injuries of many kinds. LIVS is open for any emergencies that may arise and our extended hours remain as before with each service ready to serve the needs of our clients and those patients which are referred to LIVS.

The mild weather will soon involve dispersal of pollens, weeds, dust and other allergens to add to the itchy, tearing and wheezing sensations we and our pets experience. The LIVS Dermatology Department has extended hours so that it may better offer its services to our clients and referring veterinarians and is available to consult on cases that would benefit from appropriate allergic management.

The Internal Medicine Department has expanded appointment availability for elective consultations and ultrasound evaluations Monday through Friday. The Surgery and Ophthalmology Departments have appointment hours available six days a week. Feel free to contact any of the aforementioned department's staff members about how they may be of service.

All our departments are fully staffed to serve our clients and patients all hours of every day, and consultations and appointments can be made by calling (516) 501-1700.

We welcome your comments and feedback. Please submit them to [Imarino@livs.org](mailto:Imarino@livs.org)

**-Leonard J. Marino, MD, FAAP, LVT**



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## Where You Refer Your Patient First Makes All The Difference



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**Director, Emergency Services**



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**Surgery, Neurosurgery**



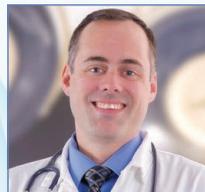
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# Integrative Medicine at LIVS



**Michel Selmer, DVM  
MS, CTCVMP, CVMMP**

The Integrative Medicine Team takes a holistic and gentle approach to treating animal disorders. While combining techniques of both Eastern and Western medicine, our Integrative Medicine Team puts an emphasis on the patient's emotional and mental well-being. Dr. Michel Selmer is one of only a handful of Traditional Chinese Veterinary Medicine Practitioners that holds a Master's Degree in the United States.

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## Integrative Treatment of Dogs with Arthritis

*Continued from front cover*

a different perspective and through a different lens. Traditional Chinese Veterinary Medicine takes an approach to look for the root cause by providing a Chinese Pattern Diagnosis and implementing long-term lifestyle changes.

Let us dive a little bit deeper. How do we formulate a Chinese Pattern Diagnosis? We use a combination of “Zang Fu Physiology” (The “Where”) and the “Eight Principles” (The “What”). First, we have to determine the “Where” the origin of the disease and then we need to determine the “What” of the disease, is the disease acute or chronic. Acute disease would be considered “Excess” whereas Chronic disease would be considered “Deficiency”. Lastly, we need to determine what the “Excess” is or what the “Deficiency” is. Once these steps have been completed we would then have a Chinese Pattern Diagnosis. According to “Zang Fu Physiology, one of the Kidney’s responsibilities is for bone in the body. So we have the “Where”. If there is arthritis we have an issue with the Kidney. If the arthritis is due to an “Excess”, it would typically be of acute onset, in a younger patient, from acute trauma and/or acute infectious disease and/or fever which would be an external invasion of Xie Qi or external pathogens (like Cold, Heat and/or Damp). If the disease is due to a “Deficiency”, it would typically be of chronic course of an illness in an older patient due to overwork, a poor diet, chronic stress, aging, and/or a genetic deficit (like a Qi, Blood, Yin or Yang deficiency). The Chinese Pattern Diagnosis would allow us to formulate a treatment plan inclusive of Acupuncture, Herbal Therapy, and Nutritional Therapy and would be guided towards tonifying the Kidney, relieving any Blood and/or Qi Stagnation, eliminating Cold/Damp/Heat, tonify Yin/Yang/Qi . . . All dependent upon which Chinese Pattern Diagnosis the patient presents with.

In many ways, Traditional Chinese Veterinary Medicine is a perfect complement in treating arthritis in dogs as it may help support, tonify and/or bolster the body to be in a better position to self-heal. This concept of Integration of Western and Eastern philosophies, combining the best of both philosophies may help to provide the best opportunity for the patient to return to optimal health. For example, if a patient ruptures a cranial cruciate ligament it needs to be diagnosed and surgically repaired. Once the surgical repair has been made then the patient needs to heal. Conventional Western Veterinary medicine provides the diagnosis and surgical repair and Traditional Chinese Veterinary Medicine provides herbal and nutritional supplements to help the ligaments in the entire body to be better lubricated to help prevent future rupture of the other



cranial cruciate ligament as well as others throughout the body helping to avoid a second surgical procedure of the other leg and improved healing and return to function. Acupuncture can also be used to help. While acupuncture cannot prevent arthritis, it can be very effective in the pain management of arthritis as well as any pain caused by surgical intervention without the side effects of drugs like NSAIDs and Steroidal Anti-Inflammatories. Acupuncture can also help to reduce muscle spasms, and improve muscle strength which may allow for a return to function faster. Typically, six acupuncture treatments will be administered. If no benefit is seen then further treatments may not be warranted. Tui-Na (a form of Chinese massage therapy) and Motion Palpation with Veterinary Medical Manipulation (aka Chiropractic adjustments) may help relieve discomfort, and restrictions in joints and return joints to the appropriate range of motion. These techniques may improve muscle flexibility, and joint range of motion, and increase blood supply which in turn improves the delivery of nutrients and removal of waste products in the joints. They may also help to prevent and/or break down scar tissue, relax the spasming muscle, and reduce patient pain levels.

So, why not offer these patients “The Best of Both Worlds”, an integration of Conventional Western Veterinary Medicine with Traditional Chinese Veterinary Medicine to help attain the best possible outcome. *“It matters not whether medicine is old or new, so long as it brings about a cure. It matters not whether theories are Eastern or Western, so long as they prove to be true”* Dr. Jen-Hsou Lin, DVM, Ph.D. Does it matter whether medicine is modern or ancient? It only matters that it produces a positive result without causing harm.

Acupuncture, Tui-Na, Veterinary Medical Manipulation, and Chinese Herbal and Food Therapy should only be performed by a Licensed Veterinarian that is formally trained and certified in each discipline.



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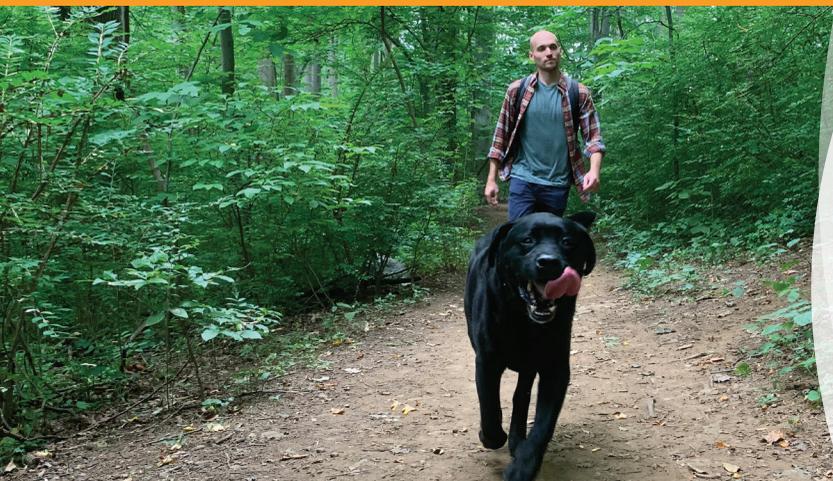
### Enhance Client Loyalty and Trust



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**For more information contact our medical director Shadi Ireifej, DVM, DACVS at  
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1. Aulakh KS, Lopez MJ, Hudson C, et al. Prospective clinical evaluation of intra-articular injection of tin-117m (117mSn) radiosynoviorthesis agent for management of naturally occurring elbow osteoarthritis in dogs: A pilot study. *Veterinary Medicine: Research and Reports*. 2021;12:1-12.

2. Donecker J, Fabiani M, Gaschen L, Aulakh KS. Treatment response in dogs with naturally occurring grade 3 elbow osteoarthritis following intra-articular injection of Sn (tin) colloid. *PLoS ONE*. 2021;16(7). e0254613. <https://doi.org/10.1371/journal.pone.0254613>.

3. Lattimer JC, Seltling KA, Lunceford JM, et al. Intraarticular injection of a Tin-117m radiosynoviorthesis agent in normal canine elbows causes no adverse effects. *Vet Radiol Ultrasound*. 2019;1-8. doi: 10.1111/vru.12757.

Homogeneous Tin (<sup>117m</sup>Sn) Colloid] Veterinary Device for Use in Dogs

### NAME: Synovetin OA®

Tin (<sup>117m</sup>Sn) stannic colloid in ammonium salt. It is supplied as a 2–4 mCi (74–148 MBq)/mL suspension for intra-articular (IA) injection.

### NET QUANTITY

Vials contain a prescribed dose up to 6.0 mCi (222 MBq) at the date and time to treat one dog. 1 mL of suspension contains 2–4 mCi (74–148 MBq) of tin (<sup>117m</sup>Sn) stannic colloid in ammonium salt at the date and time of end use.

### PRODUCT DESCRIPTION

Synovetin OA® is a conversion electron therapeutic veterinary device comprising a colloidal, sterile suspension with a pH between 6.5 and 9.0 where at least 90% of the particles have a size between 1.5 µm and 20 µm (HORIBA light scatter instrument). The <sup>117m</sup>Sn emits monoenergetic conversion electrons (significant energies 127–158 keV; emission probability 113%) and imageable gamma radiation (159 keV, 86% abundant). Accompanying low-energy emissions are Auger electrons (<22 keV) and X-rays (<30 keV). The half-life of <sup>117m</sup>Sn is 14 days. <sup>117m</sup>Sn decays by isomeric transition to stable <sup>117</sup>Sn.

Excipients include ammonium carbonate ((NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub>), ammonium chloride (NH<sub>4</sub>Cl), ammonium iodide (NH<sub>4</sub>I), iodine (I<sub>2</sub>) and trace tin (Sn) salts.

### MECHANISM OF ACTION

Synovetin OA® is a veterinary device consisting of a homogeneous tin colloid which emits discrete (<300 µm) low-energy conversion electrons confined to the joint space. The colloid is composed of microparticles (1.5 µm to 20 µm) that are retained in the joint space of the dog. The particles are absorbed and retained by synoviocytes and macrophages in the synovium, resulting in apoptosis and reduction of inflammatory cells. Elimination of the pro-inflammatory cells reduces inflammation of the joint synovium, thereby reducing pain associated with synovitis. The data, including radiographic evidence, supports use in Grade 1, 2, and 3 osteoarthritis (OA) of the elbow joint.

### CAUTION

Federal law restricts this device to sale by or on the order of a licensed veterinarian trained in the use of radioactive veterinary medical products. Use of this product is restricted to facilities with a compatible Radioactive Materials (RAM) license.

### INTENDED USE

Synovetin OA® is intended to reduce synovitis and associated pain of canine elbow joints afflicted with osteoarthritis.

### WARNINGS

Do not exceed 6.0 mCi (222 MBq) of radiation activity per dog per treatment. Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental injection or ingestion by humans.

### PRECAUTIONS

Injection should be performed only by a licensed veterinarian skilled in the delivery of intra-articular (IA) injections who is located at a facility that has a RAM license.

Rigorous aseptic technique must be ensured during injection

### ROUTE OF ADMINISTRATION

Intra-articular injection. The product must NOT be administered by any other route. Confirmation of needle placement is recommended, whether by anatomical landmarks, fluoroscope, C-arm, ultrasound, or radiography.

### DIRECTIONS FOR ADMINISTRATION

Dogs should be appropriately anesthetized or deeply sedated prior to administration to prevent vocalization and resistance to dosing. A 22-ga. needle can be used to inject Synovetin OA® directly into the elbow joint. Pain during and after treatment may occur. Administration of non-steroidal anti-inflammatory agents at the labeled dose may help any post-treatment pain.

### FREQUENCY OF ADMINISTRATION

If needed, Synovetin OA® can be readministered to a previously treated elbow at least 12 months after the last treatment.

### DURATION OF EFFECT FROM ADMINISTRATION

Effectiveness has been shown to last up to 12 months following a single treatment of dogs with naturally occurring OA of the elbow.

### MAXIMUM ANNUAL DOSE

Total radiation dose per joint should not exceed 3.0 mCi/joint, with the total body dose not exceeding 6.0 mCi (i.e., two elbow joints during a 12-month period).

### ADVERSE REACTIONS

Dogs participating in clinical studies to evaluate safety and effectiveness (n=74 dogs, 97 elbow joints) exhibited no significant adverse reactions when administered Synovetin OA®. Discomfort in the treated elbow has been rarely reported in some dogs up to 72 hours after treatment. If adverse events are observed or suspected, please report them by calling Exubriion Therapeutics® Customer Service at 1-833-942-1247.

### POST-INJECTION CARE

Following administration of Synovetin OA®, the dog can recover with other post-operation animals in the general clinic population. Once the dog has fully recovered from anesthesia, it can be discharged to go home with the approval of the facility radiation safety officer or authorized user. All treatment site policies and license requirements should be observed.

### OWNER INSTRUCTIONS FOR POST-TREATMENT CARE

When the level of radiation is determined to be below the established levels for release, the dog can be discharged. The dog will, however, retain a low level of radioactivity in the treated joint(s) for a short period of time. Specific written instructions based on the post-treatment radiation dosimetry for care and proximity to the treated dog will be provided by the radiation safety officer (RSO) or authorized user (AU) of a radioactive materials (RAM)-licensed veterinary hospital to the dog owner. These instructions include information on limiting proximity to the dog in the post-treatment period. In the judgement of the veterinarian, the dog owners are not likely to comply with the release instructions, the product should not be administered. A RAM-licensed veterinary hospital RSO or AU should contact Exubriion Therapeutics® if there are specific questions. Apart from the proximity requirements to protect people there is no requirement for restraint of the dog itself, and it can resume its normal level of activity subject to the distance requirements.

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Store in the shipping container at controlled room temperature (10°–30°C or 50°–86°F) until ready to use.

# INTEGRATIVE TREATMENT MODALITIES IN SMALL ANIMAL VETERINARY NEUROLOGY

## Review of the literature and suggestions for implementation in clinical practice – Part 2

Patrick F. P. Roynard, DVM, MSc, MRCVS, DACVIM (Neurology), certified disk arthroplasty surgeon



### Acupuncture for Cervical Spondylomyelopathy (CSM)

A clinical trial of 40 dogs with presumptive or diagnosed CSM evaluating the efficacy of standard treatment (medical and surgical) vs standard treatment + EA reported an overall efficacy of EA of 85%, while surgery and conventional medical

treatment resulted in a low 20% efficacy in this trial (noticeably lower than classically reported for this condition) (Sumano et al 2000). A retrospective study over 19 animals (13 dogs and 6 horses) with presumptive or diagnosed CSM reported results obtained with TCVM treatment, consisting of DN, EA, aquapuncture (1000 µcg/ml Vitamin B-12), *Jing Tong Fang* (Cervical Formula) for all patients, modified *Da Huo Luo Dan* (Double P II) in grades 2 or higher, *Shen Tong Fang* (Body Sore) in patients with cervical pain, and additional Chinese herbal medicines based on the Chinese pattern diagnosis. Of the 19 cases, 10 (52.6%) had complete clinical recovery and 8 (42.1%) improved one or more grade(s). Only 1 horse with poor tolerance of acupuncture precluding completion of treatment showed no improvement, resulting in 13/13 dogs improving (Xie and Rimar 2010). As for IVDD, the author still recommends advanced imaging and surgery (if indicated) for presumptive cases of CSM, but also recommends integrating TCVM and neurological rehabilitation for ideal pain management and functional recovery.

### Choice of acupuncture points when treating neurological disorders

Despite the lack of a simple, common criteria defining acupuncture points and differentiating them from non-acupuncture points from a western medical stand point, recent studies have allowed identification of criteria associated with higher likelihood of effect when considering acupuncture points. Up

to 70% of acupuncture points have been identified as motor entry point, which are locations where the motor branch of a nerve enters the muscle belly of an innervated muscle (Lee et al 2019). These points can be identified with NMES as the point that will elicit maximal contraction of a muscle belly if stimulated. Recently, acupuncture points have also been identified as neurogenic inflammatory spots, which are spots of local tissue response caused by cutaneous neurogenic inflammation encountered in visceral disorders, and located in the dermatome overlapping with the considered visceral afferent innervation (Kim et al 2017). Features of neurogenic spots include plasma extravasation, vasodilation in the postcapillary venules of the skin, and wheal-and-flare reaction arising from the release of calcitonin gene-related peptide (CGRP) and substance P (SP) from activated small diameter sensory afferents. Neurogenic spots also show hypersensitivity, high electrical conductance and small diameter nerve fibers-mediated sensation (C fibers, Aδ), features classically associated with acupuncture points (Li et al 2004). Overall approximately 70% of neurogenic spots were found to match with acupoints. More importantly, in murine models of colitis and hypertension, acupuncture was effective when performed at acupoints that were also neurogenic spots, and not at non-neurogenic spots acupoints (Kim et al 2017).

Although it has been reported that acupuncture is more efficient when practiced according to the TCVM pattern diagnosis presented by the patient, based on these studies and personal observations, the author suggests including local points (e.g. *Jing-jiaji*, located dorsal and ventral to the transverse processes of the cervical vertebrae, when treating cervical IVDD) and distal points (including specific acupuncture points identified as motor entry point and/or neurogenic spots) when using EA for neurological disorders (see Table 2).

Table 2. Suggested acupuncture points for neurological disorders, location and indications (acupuncture points that are motor entry points are listed in **bold**).

	<b>Acupuncture Point</b>	<b>Anatomic Location</b>	<b>Suggested Indications (emphasis on neurological disorders):</b>
<b>Thoracic limbs</b> (from proximal to distal)	LI-11 (Large Intestine 11)	On the lateral end of the cubital crease; with the elbow flexed the point is halfway between the lateral humeral epicondyle and the biceps tendon	Thoracic limbs paresis, radial nerve disorders, elbow pain, diarrhea, clearing <i>Heat</i>
	<b>LI-10</b> (Large Intestine 10)	1/6 of the distance between the elbow and the carpus, between the extensor carpi radialis and the common digital extensor muscles (2 cun distal to LI-11)	Thoracic limbs paresis (and paraparesis), musculocutaneous and radial nerves disorders, contralateral motor cortex disorders, elbow pain, immune regulation, diarrhea
	LI-4 (Large Intestine 4)	Between the 2nd and 3rd metacarpal bones, at the midpoint of the 3rd metacarpal bone on the medial side	Thoracic limbs paresis, Master point for face and mouth
	PC-8 (Pericardium 8)	Underneath the central pad between the 3rd and 4th metacarpal bones	Thoracic limb paresis, median nerve disorders, oral disorders (e.g. stomatitis) ; bilateral PC-8 form the 4 roots with bilateral KID-1
<b>Pelvic limbs</b> (from proximal to distal)	<b>SP-10</b> (Spleen-10)	In a depression just cranial to the second belly of the Sartorius muscle, approximately 1 patellar length proximal and 1 patellar length caudal to the top of the patella (2 cun in a proximo-medial diagonal direction from the patella)	Paraparesis and paralysis, femoral nerve disorders, <i>Blood</i> deficiency
	<b>BL-40</b> (Bladder 40)	In the center of the popliteal crease. The point is found by directing the needle cranially towards the patella	Paraparesis, sciatic nerve disorders, spinal and pelvic pain, pyelonephritis, urinary pain, coxofemoral joint pain, Master point for lower back
	<b>GB-34</b> (Gallbladder 34)	In the depression, just distal and cranial to the head of the fibula on the lateral side of the pelvic limb	Paraparesis, sciatic nerve disorders, tendon and ligament pain, stifle pain
	<b>ST-36</b> (Stomach 36)	Just off the lateral aspect of tibial tuberosity into the belly of the cranial tibialis muscle	Paraparesis, sciatic nerve disorders, contralateral motor cortex disorders, gastrointestinal or abdominal pain, nausea, vomiting, gastric ulcers
	BL-60 (Bladder 60)	In the thin fleshy tissue between the lateral malleolus and the calcaneus, level with the tip of the lateral malleolus	Paraparesis, sciatic nerve disorders, spinal pain, tarsal pain, headache, cervical pain, hypertension
	LIV-3 (Liver 3)	Between the 2nd and 3rd metatarsal bones, proximal to the metatarsophalangeal joint just prior to where the metatarsal bones fuse.	Paraparesis, Generalized pain, anxiety, pelvic limb lameness
	KID-1 (Kidney 1)	Underneath the central metatarsal pad, parallel with the plantar surface, proximal to distal	Paraparesis and paralysis, heel pain ; bilateral KID-1 form the 4 roots with bilateral PC-8
<b>Truncal (paraspinal)</b>	<i>Jing-jia-ji</i> (cervical <i>Hua-tuo-jia-ji</i> )	Just above and below the transverse processes at the level of the intervertebral spaces from C1 to C7, on each side of the neck	Cervical pain and stiffness (e.g. IVDD, cervical spondylomyelopathy)
	<i>Hua-tuo-jia-ji</i>	Between the vertebral bodies from T1 to L7, 0.5 cun* from the midline—just within the paraspinal musculature. Points are found inside the Bladder meridian. (There are 19 acupoints on each side of the back).	IVDD, spinal pain
	BL-23 (Bladder 23)	1.5 cun* lateral to the caudal border of the spinous process of the 2nd lumbar vertebrae.	Spinal pain, paraparesis, urinary tract pain, pyelonephritis
	Bai-hui	Between the spinous processes of L7 and S1 on dorsal midline. (Location of where lumbar epidurals are performed).	IVDD, lumbosacral (LS) disease, pelvic limb pain

## Electro-acupuncture treatment timing and parameters

From a practical, clinical standpoint, the author recommends acupuncture early after injury or within the acute course of the neurologic disease (ideally initiated within 24-72 hours after initial injury or surgery), in order to maximize benefits of reducing pro-inflammatory mediators and enhancing release of plasticity promoters at an optimal time for neuroplasticity. Very low frequency EA (2-10Hz) is helpful in treating neuropathic pain and has been, like low frequency EA (20-40Hz), associated with endorphins and enkephalins release. High frequency (80-120Hz) and very high frequency (200Hz) have been associated, respectively, with dynorphin and serotonin release. Suggested protocol includes 10 minutes at low frequencies (20/40 Hz), followed by 5-10 minutes at higher (80/120 Hz) and very high frequencies (0/200 Hz), with added very low frequency (2-5Hz) for 5-15 minutes in case of neuropathic pain, based on severity and patient's tolerance. The author suggests always starting treatment with "permission points" (e.g. GV-20 and bilateral An-Shen) to ensure better patient relaxation and compliance. The author suggests starting treatment with EA 1-2 times/week for the first 3 weeks prior to considering progressive reduction of frequency.

Another benefit of acupuncture is that, as a passive modality, it is an acceptable therapy in acute inflammation when the patient may not be a candidate for other interventions (e.g., in cases of pain preventing active treadmill work or patients with unstable vertebral fractures) (see **Figure 1**) or in the early post-operative period (see **Figure 2**).

**Figure 2. A)** Sagittal and **B)** Transverse T2 weighted fat-sat MR images showing protrusion of the meninges and spinal cord/nervous tissue (myelomeningocele) through bifidous spinous process at the last lumbar vertebra (spina bifida) in a 6MO French Bulldog with congenital urinary/fecal incontinence. The spinal cord is deviated dorsally on the images, consistent with tethered cord syndrome. **C)** 3-Dimensional reconstruction of CT images showing spina bifida at the last lumbar and first sacral vertebrae/spinous processes. **D-F)** Intra-operative images of surgical correction. After identification of the myelomeningocele (**D**), it is dissected down to the vertebral canal and the nervous structures (visible through the durotomy incision (**E**)) are being dissected from adhesions and normal anatomy restored after durectomy (**F**). **G)** Patient 1 day post-operative receiving electro-acupuncture at GV-1, CV-1, ST-36, and BL-40.





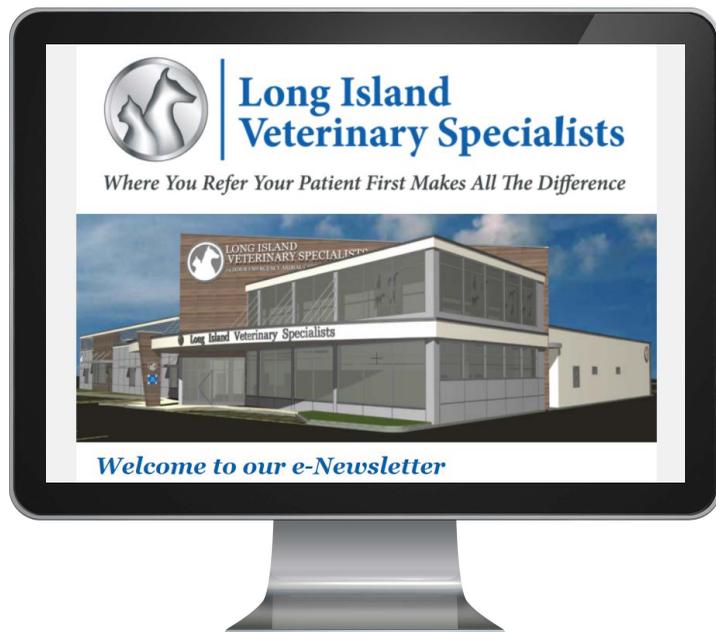
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