

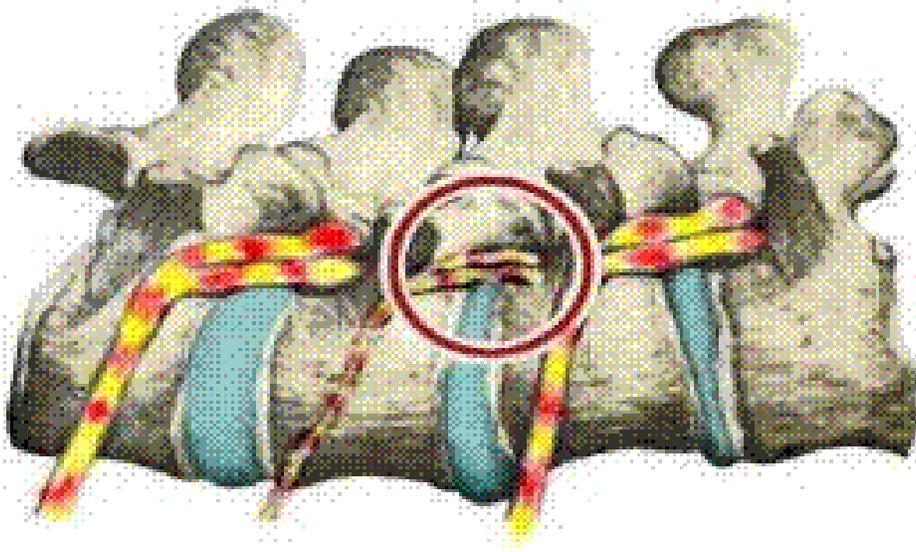


Animal Clinic of Michigan City

Veterinary Orthopedic Manipulation(VOM)

Introduction

The goal of Veterinary Orthopedic Manipulation (VOM) is to treat the Vertebral Subluxation Complex (VSC). This is a functional defect of a joint that causes neurologic signs, or pain, that might not show up on a Radiograph (X-ray). The effects of VSC can include mobility problems, muscle spasm, neurologic defects and inflammation.



A subluxation (a.k.a. Vertebral Subluxation Complex) is when one or more of the bones of the spine (vertebrae) move out of its normal position and creates pressure on, or irritates a spinal nerve and nerve root. Spinal nerves are the nerves that come out from between each of the bones in your spine. This pressure or irritation on the nerves causes them to malfunction and interfere with the signals traveling over the nerves to other parts of the

body (such as the muscles). In the illustration above, the encircled spinal nerve is impinged upon and is not working as efficiently as the nerves in front of and behind it.

How does this affect your pet? Your nervous system controls and coordinates **all** the functions of the body. If you interfere with the signals traveling over nerves, parts of your body will not get the proper nerve messages and will not be able to function at 100% of their innate abilities. In other words, some part of your pet's body will not be working properly.

Disease related to the spinal cord has traditionally been treated with a combination of surgery and medication (such as steroids and anti-inflammatories). Through the use of VOM, we now have another treatment modality to treat the spinal cord, thus helping all the organs in the body. VOM is a noninvasive and non-painful way to dramatically minimize the effects of spinal cord dysfunction. In most cases the improvement is so significant that we can diminish the use of medications, sometimes even stopping them altogether. Below is a detailed explanation of the use of Veterinary Orthopedic Manipulation (VOM) at the Animal Clinic of Michigan City.

VOM Theory

Let's review some of the concepts we illustrated above. Alterations in the biomechanical or physiological dynamics of the joints of the vertebral column (called a subluxation because the bones are partially dislocated) cause spinal nerve dysfunction as the nerve roots leave the spinal cord. This is VSC. The dysfunction can lead to mobility problems in the joint, swelling and inflammation in the joint, or spasms of the muscles immediately around the vertebrae. The nerve root that has a dysfunction causes disease in many internal organs that are innervated by a particular nerve root.

The negative forces that caused the dysfunction in the first place are from trauma and environmental toxins. Most pets have had significant trauma to their spinal canal since they were young. It comes in the form of playing with a Frisbee, jumping off or onto something, general play, and excessive running. For some pets, going down stairs might be the biggest predisposing factor to subluxation. We recommend harnesses for most dogs since collars put extra strain on the neck and might predispose to VSC.

In many cases, the changes in the vertebral column that surround the area of nerve dysfunction do not show any changes, and thus are normal on a radiograph. When radiographic changes of this nerve dysfunction are present, they occur long after the problem originated. In some cases the nerve dysfunction from the subluxation can be low-grade or intermittent, taking years to show up on a radiograph.

In VOM we counteract nerve dysfunction by "re-setting" the joint with a gentle and painless force. We are counteracting all of the negative forces that have built up on the spinal canal and nerve roots over a period of time. The nerves in the area can begin acting normally again, which increases blood flow to internal organs, correcting many

diseases. Some of the diseases that are responsive to VOM therapy include:

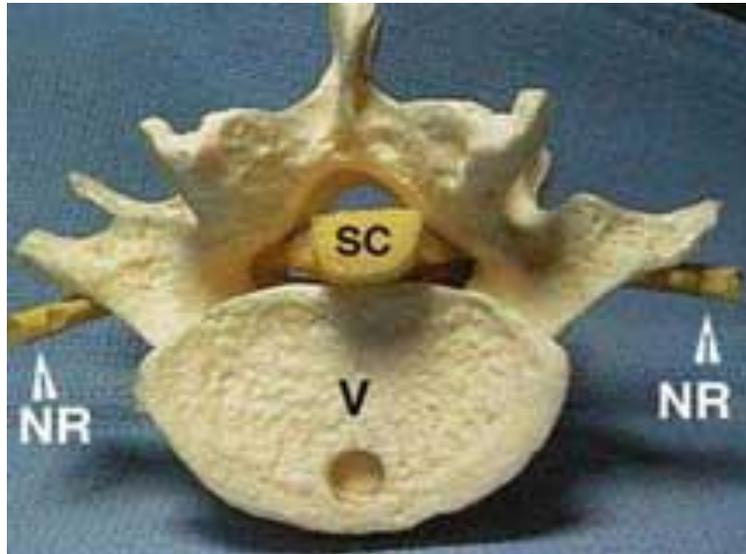
- Inflammatory Bowel Disease (IBD)
- Incontinence
- Arthritis
- Recurring Ear Infections
- Feline Lower Urinary Tract Disease (FLUTD)
- Allergies
- Hip Dysplasia
- Canine Wobblers (Cervical Instability)
- Vertebral Disc Disease
- Fecal and Urinary Incontinence
- Degenerative Myelopathy (Downer Dog Syndrome)
- Feline Hyperesthesia Syndrome (skin-spinal reflex phenomenon)
- Lumbo-sacral subluxation complex
- Epilepsy

The nature of this technique allows us to detect disease states before clinical symptoms appear, allowing us to initiate treatment before your pet exhibits clinical signs of disease. This means that we now have at our disposal a tool to determine if your pet is starting to get a disease before the disease becomes well entrenched. This approach is far superior to allowing a disease to become entrenched, and more difficult to treat. When treated at this early stage the disease process can be minimized, and sometimes even eliminated. In a sense, VOM is a form of preventive medicine.

The Spine

The spinal cord is an extremely sensitive and complex part of the nervous system. In essence, it is an extension of the brain. Subtle changes in pressure on the spinal cord itself can cause significant changes in the body. The spinal cord is completely enclosed in bone for protection. To allow for movement, and to allow nerve branches to leave the spinal cord, it is flexible and has openings.

This view of a spinal cord model is an end-on view of how the spinal cord (SC) fits into the spinal canal. You can see how the spinal cord is enclosed by bone. If it swells it has no place to expand into, resulting in serious damage to the cord. This swelling can occur when VSC is present. The swelling causes Nerve Roots (NR) to malfunction leading to impaired function in other parts of the body (such as muscles or internal organs.)

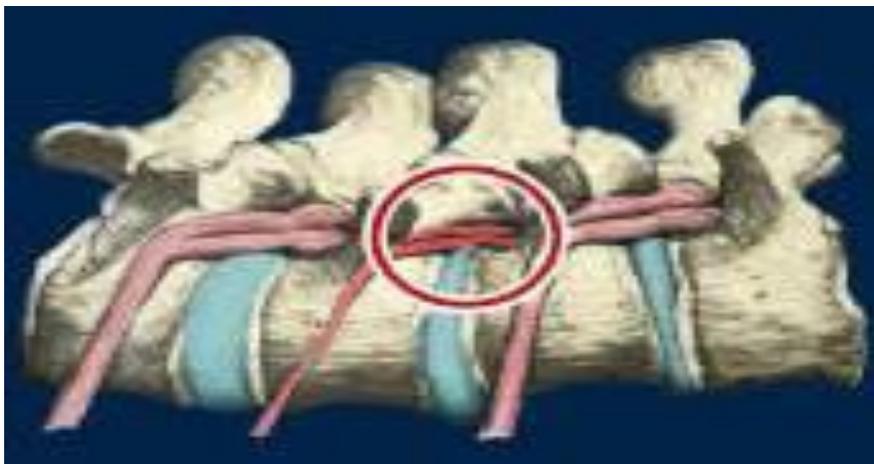


This picture greatly simplifies the anatomy of this area. In reality, there are many blood vessels, nerves, muscles, and connective tissue all around the spinal cord.

In the **VSC**, various things are happening inside your pet's body simultaneously. These various changes, known as "components," are all part of the vertebral subluxation complex. There are five categories of components present in the **VSC**. These five are:

The osseous (bone) component is where the vertebrae are either out of position, not moving properly, or are undergoing physical changes such as degeneration.

The Nerve Component is the malfunctioning of the nerve. Research has shown that only



a small amount of pressure on spinal nerves can have a profound impact on the function of the nerves. As you can see, this pressure can alter not only the nerve function, but also the nerve itself.

The Muscle Component is also involved. Since the muscles help hold the vertebrae in place, and since nerves control the muscles themselves, muscles are an integral part of any **VSC**. In fact, muscles both affect, and are affected by the **VSC**. Often we see muscle spasms and muscle pain as a result of **VSC**.

The Soft Tissue Component is when there is misaligned vertebrae and pressure on nerves resulting in changes in the surrounding soft tissues. This means the tendons, ligaments, blood supply, and other tissues undergo changes. These changes can occur at the point of the **VSC** or far away at some end point of the affected nerves.

The Chemical Component is when all these components of the **VSC** are acting on the body, and therefore causing some degree of chemical changes. These chemical changes can be slight or massive depending on what parts of your body are affected by your subluxations. The chemical changes are often seen as organ dysfunction or failure.

The nervous system controls and coordinates every function of the body. A large portion of the nervous system passes through the spine and exits by way of the spinal nerve at the Nerve Root (NR). These spinal nerves exit between individual spinal vertebrae and go to the various parts of the body. To be healthy it is essential that the nervous system functions properly and be free from any interference caused by **VSC**. Subluxations can cause interference to the nervous system at any point along the spine where the nerves exit. This can adversely affect the function of various parts of the body, and ultimately the health of your pet. The chart below is designed to give you a look at just some of the relationships between the areas of the spine and corresponding nervous system. Keep in mind that the nervous system is much more complex than can be shown here (On the next page).

Area	Spine	Nerve Supply
Upper Cervical Spine Upper Neck C1 - C2		Head, face, upper neck, inner & middle ear, sympathetic nerve system, sinuses, eyes, auditory nerves and more.
Cervical Spine Mid and Lower Neck C3 - C7		Neck, shoulders, thyroid, teeth, outer ear, nose, mouth, vocal cords, and more.
Thoracic Spine Mid Back T1 - T13		Forelimbs, heart, esophagus, trachea, lungs, bronchial tubes, gallbladder, liver, stomach, pancreas, spleen, kidneys, adrenal glands, small intestines, and more.
Lumbar Spine Lower Back L1 - L7		Large intestines, bladder, lower back, hind limbs, and more.
Sacrum and Coccyx or Tailbone		Hip bones, tail bone, buttocks, bladder, and more.

When the vertebrae in the picture above are misaligned only slightly there can be significant disruption to the spinal cord and the nerve roots as they leave the spinal cord. This can disrupt both the musculoskeletal system as well as internal organs. Correcting and preventing this problem is the goal of VOM.

Dogs and Cats have 30 vertebrae (backbones) not including the bones of the tail:

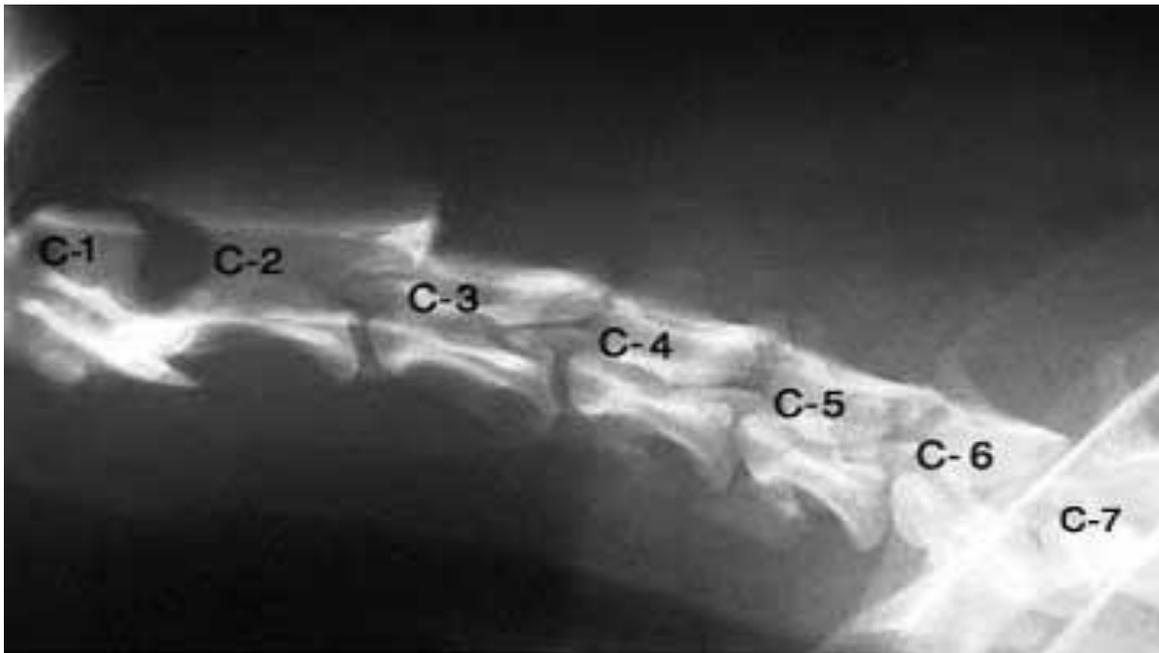
- Cervical (neck)- 7
- Thoracic (chest) - 13
- Lumbar (lower back) - 7

- Sacral (pelvis) - 3

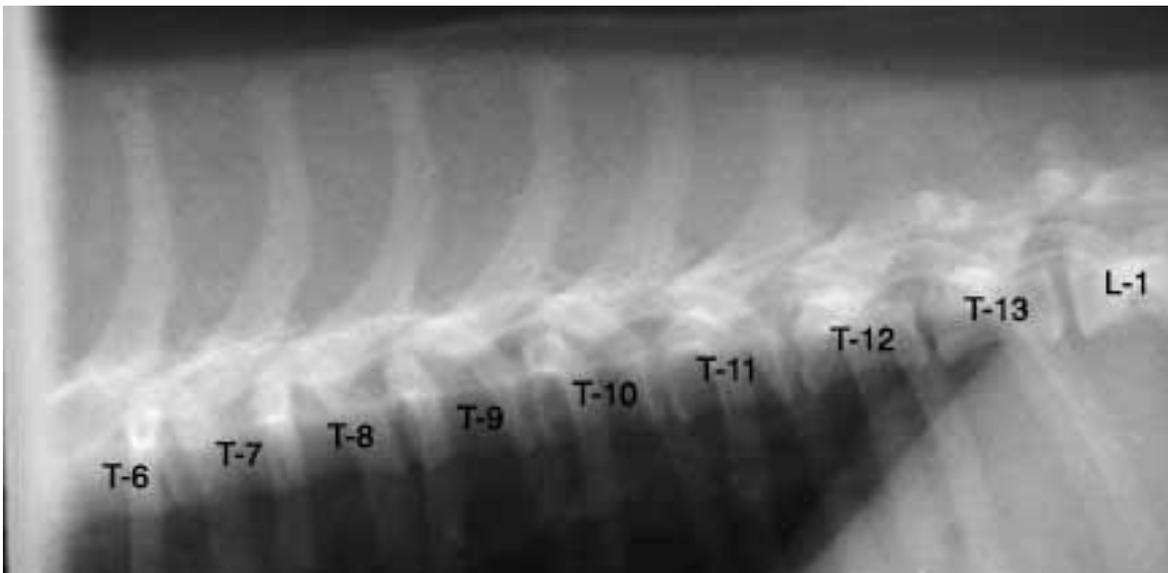
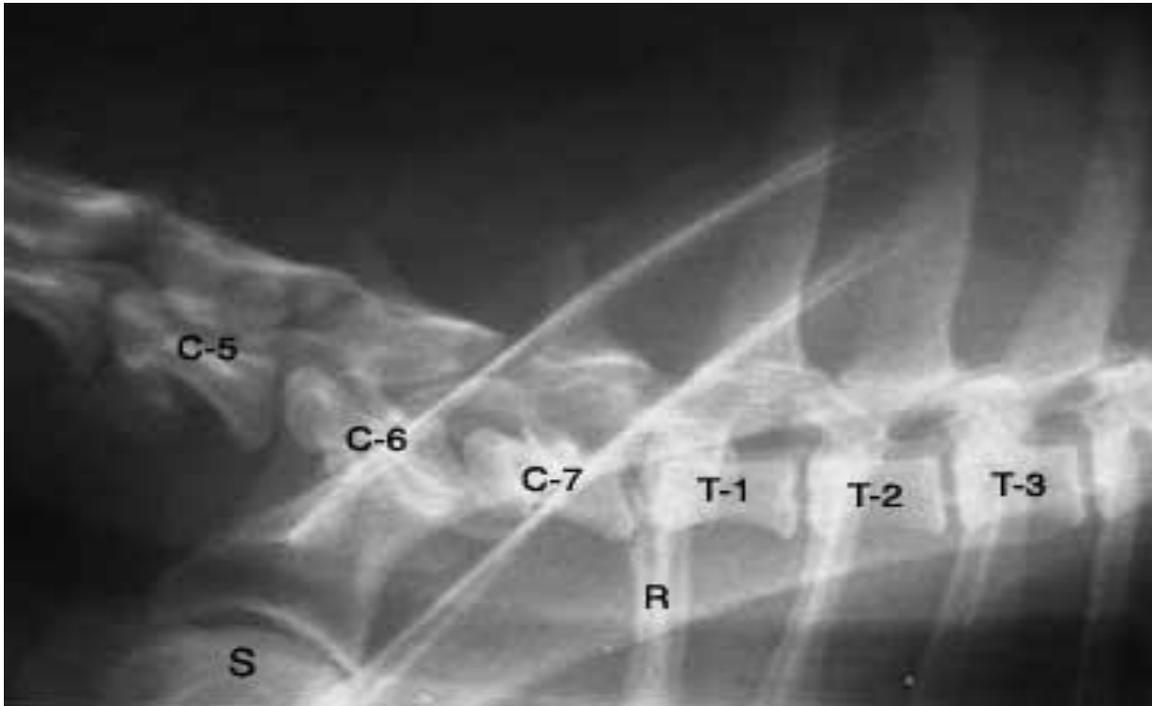
Below are radiographs (often referred to as X-rays) of the spine:

C-1 and C-2 are referred to as the atlas and the axis. The words atlas (holding up the world) and axis (what the world spins on) come from Greek mythology; they are used to refer to the relation of the spine and the skull.

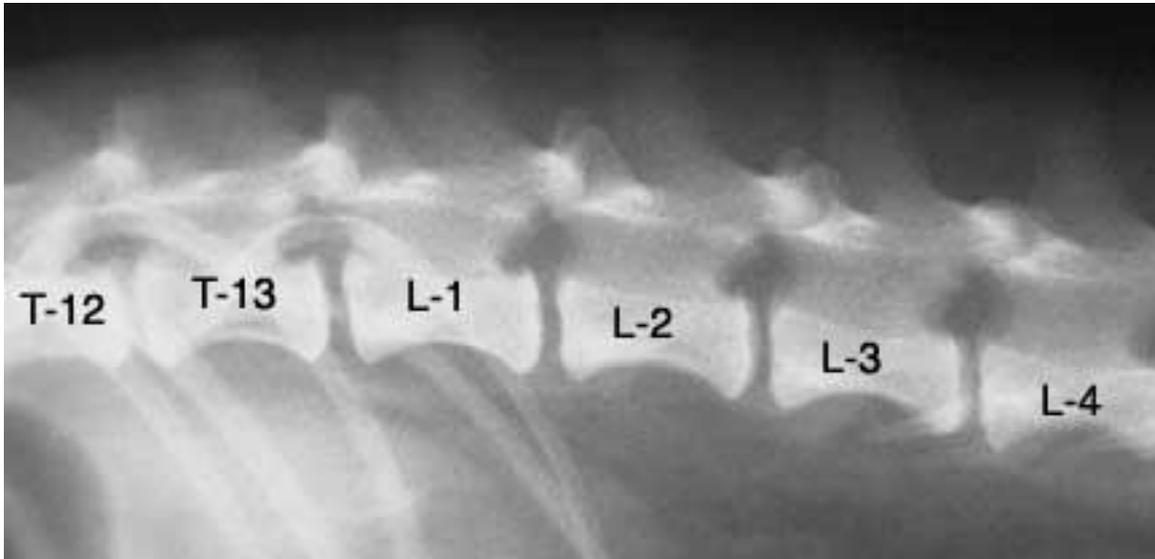
There can be instability (**VSC**) in the cervical (neck) area in large dogs that will cause neurologic problems (commonly referred to as Wobbler's Disease).



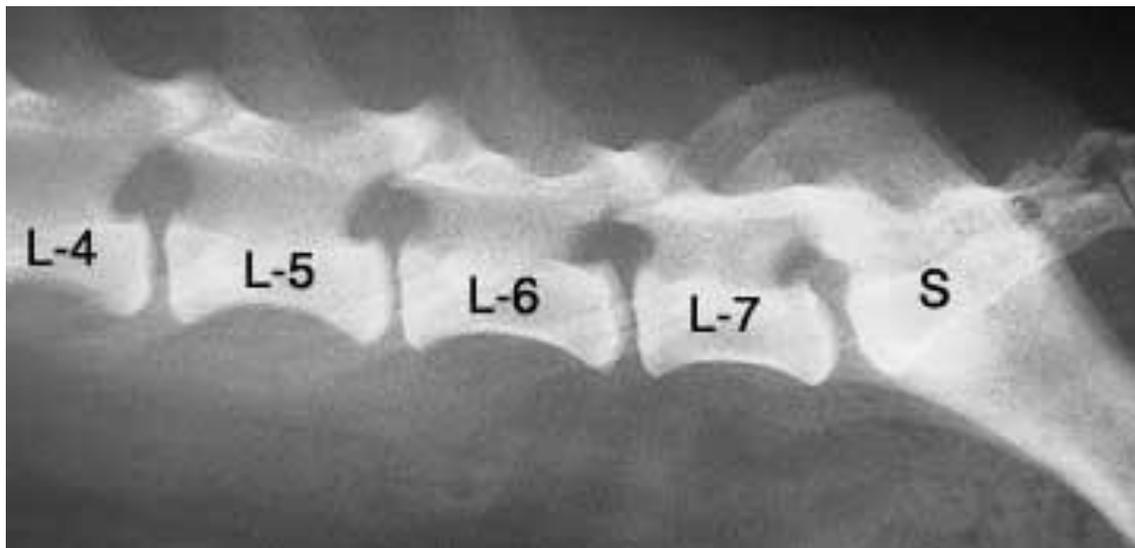
As the cervical vertebrae (labeled as C) become the thoracic vertebrae they go past the shoulder (S). The nerves that come off this cervical-thoracic junction at the shoulder are called the brachial plexus and innervate (control) the forelimbs (front legs). Each of the thoracic vertebrae (labeled as T) corresponds to a rib (R) on each side of the chest.



The thoraco-lumbar junction is the point in the spine where the thoracic vertebrae (chest) and the lumbar vertebrae (belly) join. It is a very common area to have **VSC** disease. It is this region where most disk herniations will occur (such as disk disease in dachshunds)



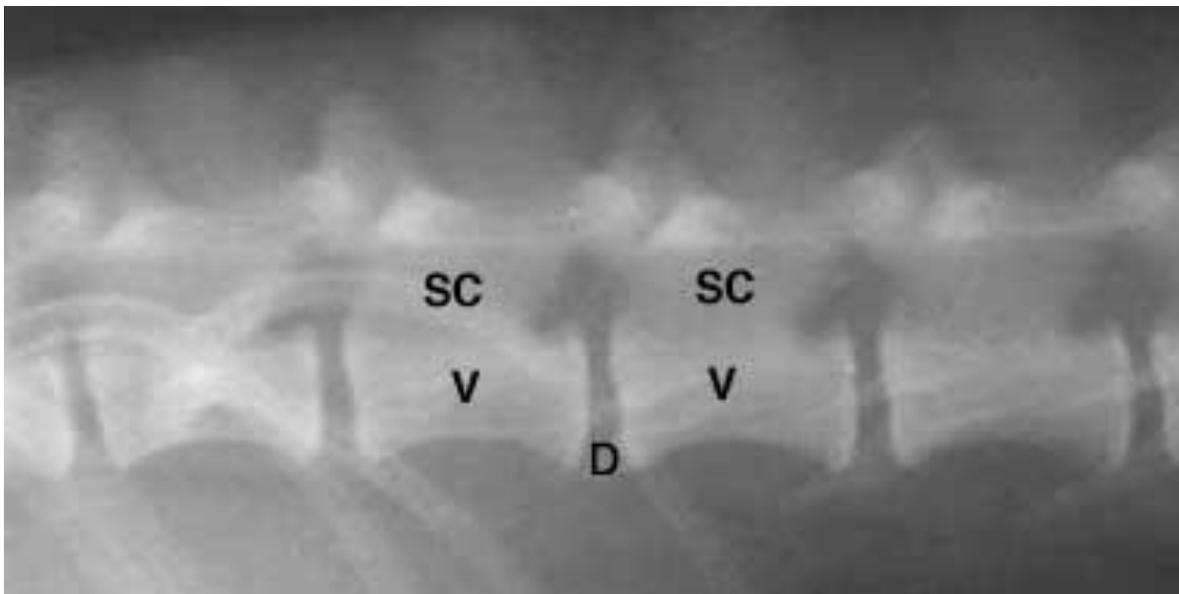
The 7 lumbar vertebrae often referred to as the lower back, eventually lead into the sacral vertebrae (S). The fused sacral vertebrae are hard to visualize because they are within the pelvis. After the sacrum we are at the tail. The nerves that correspond to the bladder and hind limbs (the legs) originate from the area indicated in the radiographs located above and below.



This side view of a spinal cord model (below) shows two vertebrae (V) with a normal disk (D) in between. One of the nerve roots (NR) can be seen coming off of the spinal cord (SC).



To keep you oriented, the model above is the same area on the radiograph below. The nerve root comes out of the dark structure that looks like a horse's head on the radiograph (below). The disk, nerve root, and spinal cord do not show up normally on a radiograph. This is one of the areas on a radiograph we look for **VSC**, although many times **VSC** can be present and there are no radiographic changes. If radiographic changes do occur, they can take months to years to become apparent on a radiograph, indicating a prolonged disease state.



In the radiograph below, the arrow points to vertebral changes that occur as a result of nerve dysfunction caused by **VSC**. The body is trying to stabilize a subluxated vertebra by laying down extra bone (called splinting or spinal arthritis). Unfortunately, these changes on the radiograph don't become apparent for many months and often years after the initial incident that caused the nerve dysfunction. VOM now gives us the diagnostic and treatment capability to prevent these severe arthritic changes from establishing

themselves. This also relieves a lot of pain and discomfort.



Equipment

Activator (spinal accelerometer)



The device fires a very fast and concise force to the vertebra (backbone) which reduces the subluxations present in the vertebral joints of your pet. It cannot create a subluxation in your pet. It can only flip the neuronal switches that are turned off, on. It cannot flip a switch off.

It provides very accurate and precise motion to specific areas of the pet's spine and if a subluxation is present, it can detect and reduce it quickly and without pain or injury. It takes only 2-4 milliseconds to apply a small amount of force to the problem area (**VSC**) to reduce the subluxation. Since there is no pain involved, anesthesia is not necessary.

The beauty of the VOM Technology is that it provides the exact amount of force to the subluxated joint needed to reduce the subluxation without having to induce a lot of motion. The device trades motion for speed to maintain the force needed to reduce the subluxation through Newton's Second Law of Motion ($FORCE=MASS \times ACCELERATION$).

Why not just use our hands?

Because our hands are too slow. The fastest an excellent veterinary chiropractor can move a joint under optimum conditions and patient cooperation is 80 milliseconds. The animal's natural reflexive resistance to adjustment is 20 milliseconds or 4 times faster. This demonstrates the need for **near perfect patient relaxation and cooperation** and is the reason that excellent techniques are imperative for success using manual adjusting. Conversely, the device fires at a rate of 2-4 milliseconds, which is 5-10 times faster than the animal's ability to resist adjustment. The patient is **ALWAYS** adjusted, **every time, all the time**, whether they want to or not, in any position, attitude or mood.

Technique

The first thing we do is try to determine where in the spinal canal nerve dysfunction is occurring. Along with determining **VSC**, we determine if there are other disease processes present. There are several ways to make this determination.

Routine Diagnostic Tests

Every pet that is presented for a problem should have routine baseline tests performed after the examination. These tests usually include a blood panel with thyroid test, a urinalysis, a fecal sample for internal parasites, and radiographs of the spine.

Not every pet with a disease has a vertebral subluxation causing nerve dysfunction. There can be infections, organ disease (like liver and kidney), heart disease, endocrine problems (thyroid disease, Cushing's, diabetes) and even tumors causing problems. If any of these problems are present, then VOM will be less effective. VOM will still reduce the subluxations, but the other diseases will not allow the spine to remain reduced.

Neurologic Reflexes

There are several reflexes to help us pinpoint areas of subluxation causing nerve dysfunction. When the spinal accelerometer is passed over a subluxated vertebra your pet will "flinch", letting us know that that is a problem area.

When the dorsal or lateral process of the bones of the vertebrae from T-3 to L-6 have a dysfunction, the skin in the lower to mid back will flinch, indicating a problem. Sometimes the problem is so apparent that just pushing gently on the spine in this area will cause the

skin to flinch. In many cases though, we need to gently stimulate the area with the activator to elicit this response.

To initiate this response we place the device over the dorsal spinous processes of the vertebrae and look for the response. We start at the vertebrae of the neck and work to the pelvic bones, noting areas where there is muscle or skin movement. This movement is also called a "read". A positive read indicates an area of **subluxation**. These reads will change when we actually treat the area, which is an indication that we are affecting a cure.

Medications, particularly anti-inflammatory (arthritis) medications and steroids, will make it difficult to interpret reads. If your pet can be taken off these medications without any serious effects it will help make the reads more accurate.

Postural Reflexes

When an animal stands it maintains tone to the extensor muscles of the legs. A spinal segment that has a problem will temporarily shut down the signal to these extensor muscles when stimulated, causing a momentary change in posture. This change can be very subtle, and might range from a yawn to a twitch, stumble, collapse, or sign of pain. Sometimes the only indication of this response is a subtle change in posture that is felt by the person holding the pet.

Once we have determined if there is a subluxation, and where it is most likely to be by analyzing our diagnostic tests and checking for reflexes, we initiate treatment. The spinal accelerometer is also used to treat, making the same pass as the initial one where we determined likely areas of subluxation. We pass the activator at least 2 times in most cases, and look for changes in the reads.

Veterinary Myofascial Release (VMR)

One of the effects of the vertebral subluxation is muscle spasms in the muscles along the back. If we stimulate this area we can relieve the muscle spasm, causing a return to normal posture and relief of pain and discomfort. Stimulating the muscles over the vertebrae also stimulates nerve centers that reside along the vertebrae, known as the somato-visceral pass (SV). These nerve centers innervate the internal organs such as the intestines, liver, kidneys and bladder.

Veterinary Myofascial Release (VMR) is a new technique that has grown out of the VOM Technology. The term "myofascia" refers to the muscle, "myo", and the connective tissue that surrounds and attaches the muscle, "fascia", hence, "Myofascial".

The release that is achieved with this technique is therapeutic on many levels:

- Primary reduction of subluxations

- Return muscles to normal tonus (tone) and function
- Enhance healing and recovery during VOM Therapy
- Strengthen and rehabilitate atrophied muscles
- Re-establish range of motion and posture
- Improve strength and performance

VMR was developed out of a desire to enhance the healing benefits of the VOM Treatment Technology. Specifically it was the skeletal muscle tension associated with subluxation that was being addressed. It was found that muscle spasms maintained VSC and kept subluxations from being reduced. This technique allows the muscle and tendon fixations associated with the spine and correlating subluxations to relax. In injured tissues of the body, the connective tissue undergoes a change from a gel, its normal state, to a solid, non-communicating substance. Conversion, by whatever means necessary, back to the communicative "gel" state, then affords a "re-communication" and thus is the goal of Veterinary Myofascial Release on the cellular level.

One of the goals of VOM subluxation reduction is to return the muscle to its original tone. It was found that VMR could easily accomplish this effect. At the same time, there is no trauma to the pet. Of course by converting the solidified connective tissue back to communicative gel we achieve cellular relief of the pathological even, and healing ensues.

Muscle spasms and increased muscle tonus are major cases of the disease states treated with VOM. These muscle spasms may not release as soon as the subluxation is reduced. It may take days to weeks before these muscles can calm down and remain normal. To this is the major application of Veterinary Myofascial Release in that it immediately relieves the accompanying muscle and fascial tension afforded by the subluxation in the first place. This creates dramatically quicker results.

Previously, physical therapy was used to rehabilitate these muscles and tendons but the process was usually arduous and painful as it can sometimes be in the human. The animal does not understand why its limbs are being forced through painful ranges of motion and generally sees the whole process as unpleasant and therefore is uncooperative.

VMR contacts lines of correction in the domestic animal that releases these tensions and does it in seconds. There is absolutely no pain or discomfort to the patient. To release these areas, the practitioner has to treat the patient with several rapid-fire pulses, directed to specific sites.

These pulses have to be fast enough and with enough force that human hands and even the VOM Adjusting Device would not be effective. The pulses have to be 5lb to 60lb and less than 20 milliseconds in duration. The pulses have to be as rapid as 10-15 per second. This is why VMR requires a special device known as the Vetrostim.

Treatment Timetable

In most pets we treat at day 1, day 3, day 7, and then every 1-4 weeks depending on response. Some pets respond well initially, and seem to be symptom free after only several treatments. These pets are not cured yet, and should be treated until there are no more reads. Our goal is to affect a cure, and then treat only once every 3-6 months to maintain the cure. The Feline Hyperesthesia Syndrome can take up to one year to cure in some cases. When VMR is incorporated with VOM, the timetable is accelerated to an adjustment on day 1, day 3, day 7, weekly for 3-4 adjustments, and then every 2 weeks until there are no more reads. This protocol is more intensive and the affected cure comes at a much quicker time-frame.

Every pet is an individual, so your exact treatment timetable might be modified by one of our doctors as treatment progresses. It is important not to let your pet jump into the car or from the front seat to back seat on the way home from our office. This can cause an adjustment to fall out of place.

VOM is not effective if your pet has a nutritional problem. This problem needs to be corrected to prevent an inadequate response to treatment.

Hypothyroidism and Cushing's disease can interfere with treatment. If your dog has these problems, it needs to be treated. In many cases treating this problem with VOM may affect a cure down the road. Because these diseases, as well as others, decrease the effectiveness of VOM, routine testing such as blood work and radiographs is imperative to obtaining a diagnosis, prognosis, and treatment with VOM.

