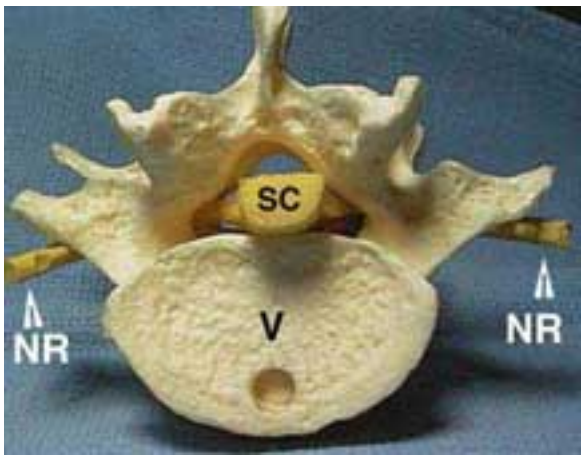
VNA (Veterinary Neuronal Adjustment)

The goal of VNA is to treat the Vertebral Subluxation Complex (VSC). This is a functional defect of a joint which causes neurologic signs, or pain, that might not show up on an X-ray. The effects of VSC can include mobility problems, muscle spasm, neurologic defects and inflammation.
Disease related to the spinal cord has traditionally been treated with a combination of surgery and medication. Through the use of VNA, we now have another treatment modality to treat the spinal cord, thus helping all the organs in the body. VNA 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. This page will give you a detailed explanation of the use of Veterinary Neuronal Adjustment (VNA) at the Long Beach Animal Hospital.
This treatment method used to be called VOM (Veterinary Orthopedic Manipulation). You might encounter this name still in the literature.
We have a few videos at the end of this page to show how it is used on actual patients.

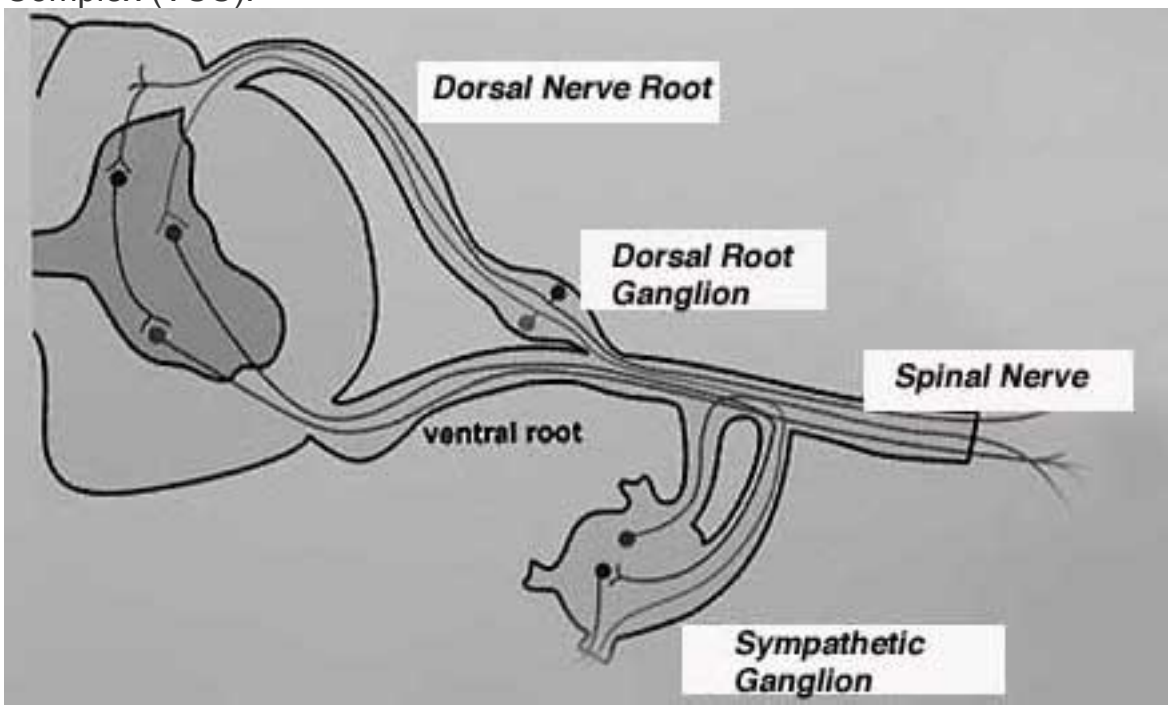
Spinal Cord Anatomy

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

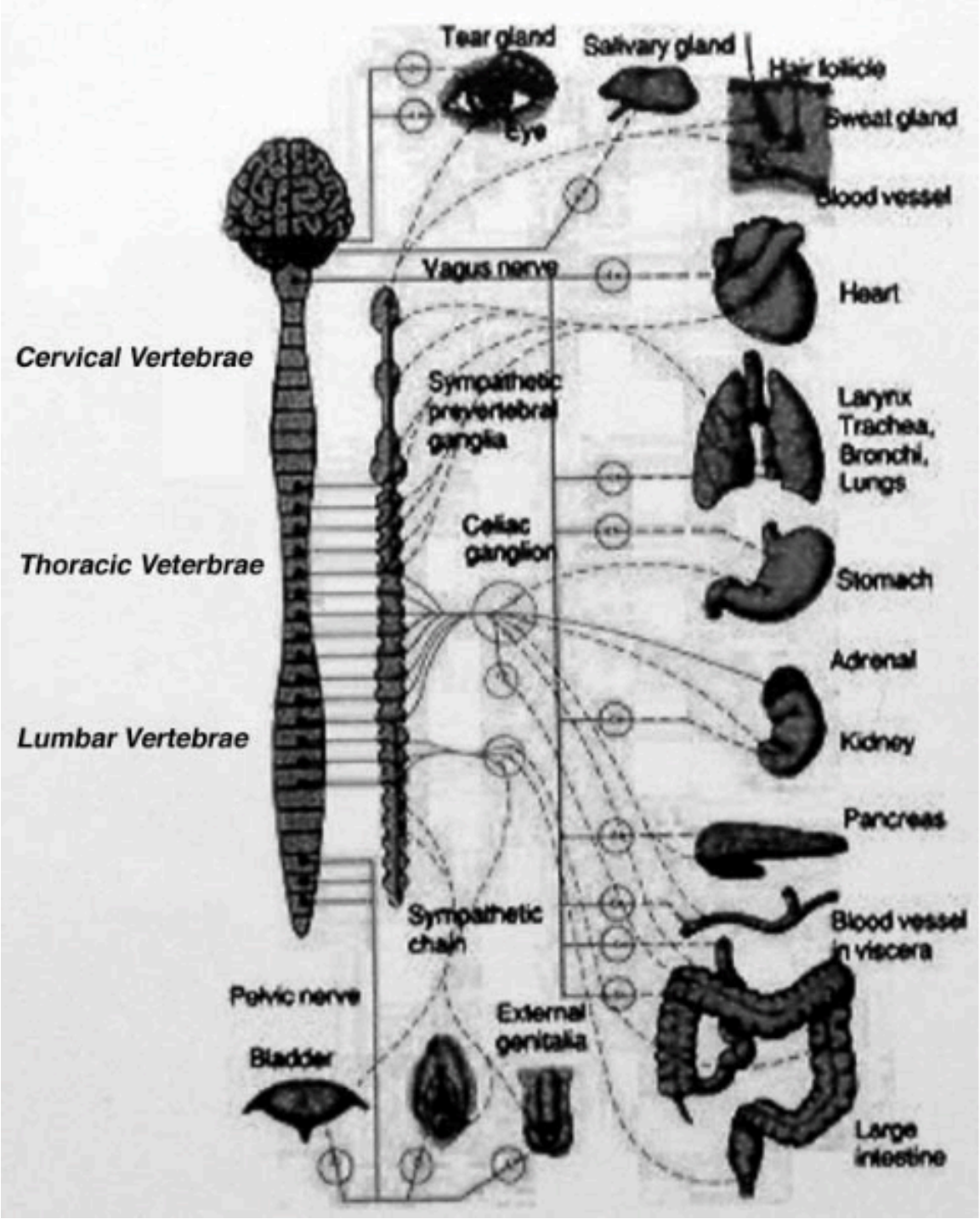
This diagram shows some of the complexity that is not so apparent in the simplified picture above. The Nerve Roots (NR) above are the same thing as the Dorsal Nerve Root in the picture below. The Spinal Cord (SC) in the picture above is the semicircular area in the top left of the picture below. When a vertebrae becomes subluxated (misaligned) it affects these nerve roots and ganglia. This leads to the disease we call Vertebral Subluxation Complex (VSC).



As the spinal cord moves from the brain down to the tail it sends out nerve branches (called nerve roots- see picture above) that go to various organs. These branches are part of the Autonomic Nervous System (ANS). The

ANS is an extremely complex system of nervous connections that runs the length of the spinal cord. Nerves that branch off from these connections innvervate all the important organs in the body. The ANS performs it magic without your conscious input. Here are a few examples of the many things the ANS does:

- Dilates your eyes when you are scared
- Increases your heart rate when you are scared
- Contracts your stomach and opens your pylorus to allow food to move into the intestines
- Stimulates your pancreas to secrete digestive enzymes into the small intestines as food moves past
- Dilates or constricts blood vessels to the internal organs. This becomes an important point when we treat diseases of internal organs like the kidneys.



In this picture you get a feel for the complexity of the ANS. As the nerve roots leave a vertebral segment they form ganglia that innervate the internal organs. This is how the VSC can affect internal organs.
To use this diagram look at the middle of the thoracic vertebrae on the left. Go to the right until you see the Celiac ganglion. A branch of this ganglion innervate the kidneys. When the vertebrae in the middle of the thoracic area have VSC they kidneys can be affected. When treated with VNA the

nerves that supply the kidneys with normal blood flow become dilated. This increases blood flow to the kidneys, and helps them if they are diseased.

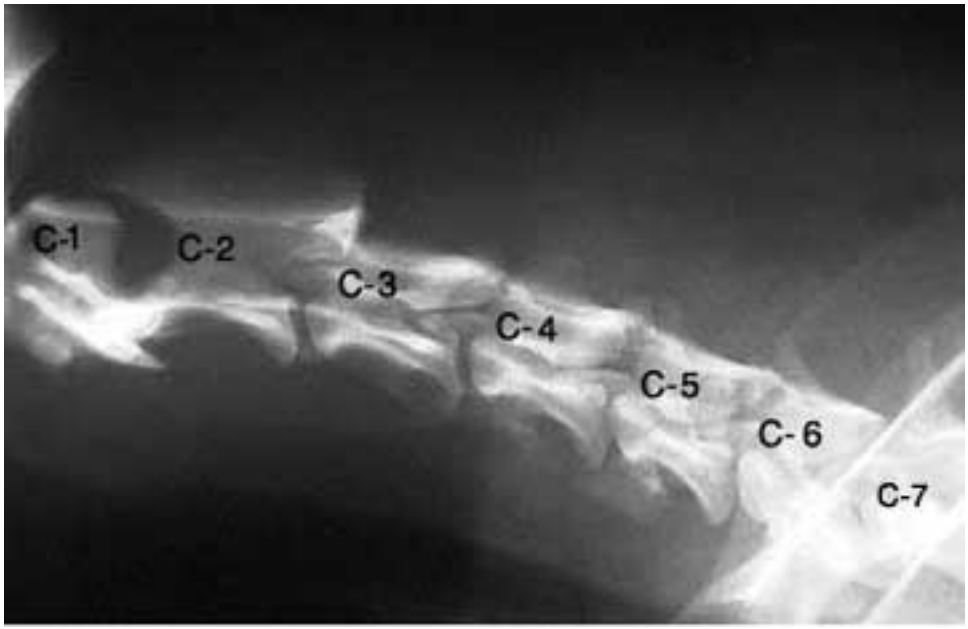
When the vertebrae in the picture above are misaligned only slightly there can be significant disruption to the spinal cord and the nerve roots as they leave the spinal cord. Correcting this problem is the goal of VNA.

Vertebral Anatomy

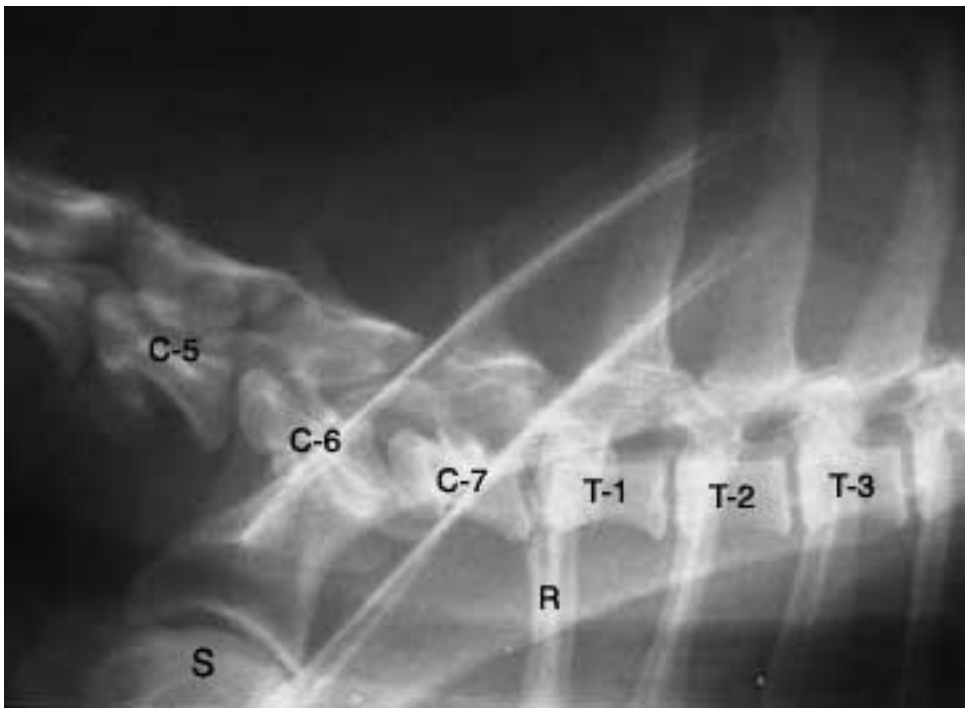
The dog has 31 vertebrae:

- Cervical (neck)- 7
- Thoracic (chest) – 13
- Lumbar (lower back) – 7
- Sacral (pelvis) – 3 (fused)

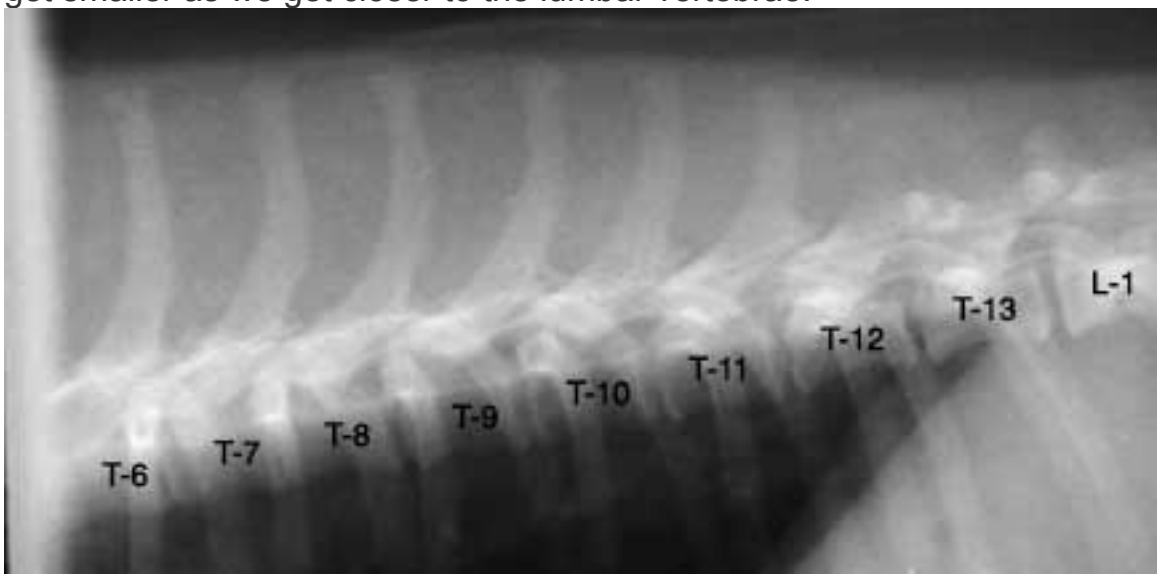
Let's go on a tour of this anatomy by looking at overlapping radiographs: C-1 and C-2 are called the atlas and the axis. The words atlas (holding up the world) and axis (what the world spins on) come from Greek mythology. There can be an instability in this area in large dogs that will cause neurologic problems. The cervical vertebrae are quite flexible, for obvious reasons. VSC can occur in this area.



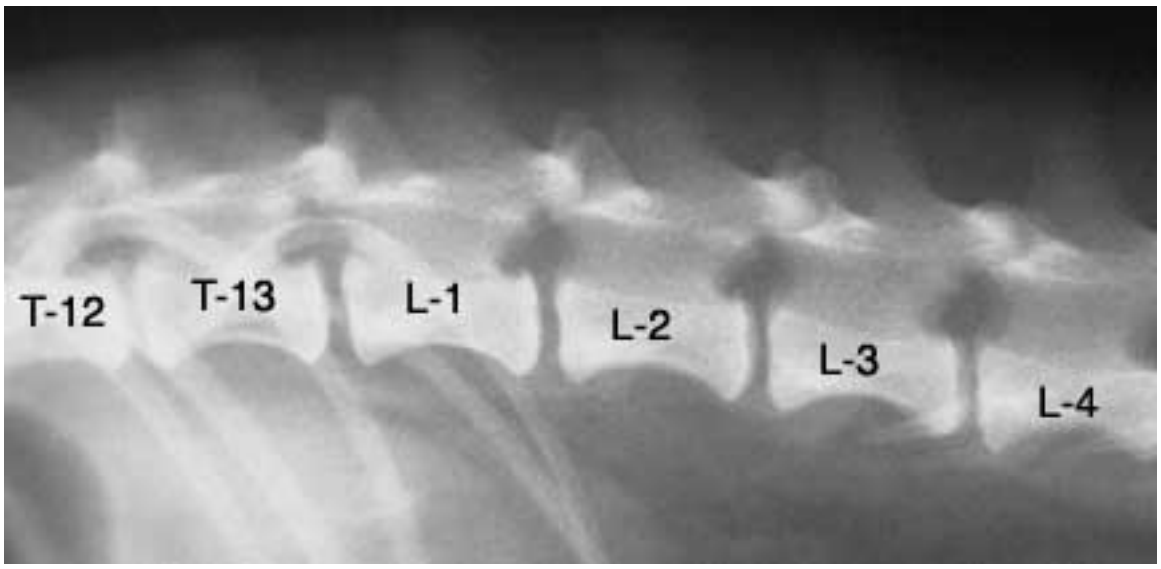
As the cervical vertebrae become the thoracic vertebrae they go past the shoulder (S). The nerves that come off this cervical-thoracic junction at the shoulder are called the brachial plexus (you cannot see nerves on a plain radiograph). They innervate the front legs on each side. Each of the thoracic vertebrae corresponds to a rib (R) on each side of the chest.



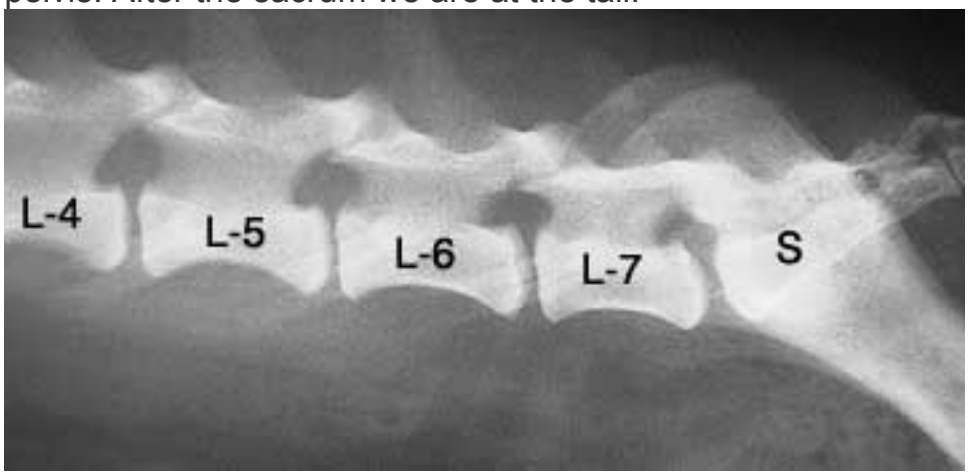
As we continue down the thoracic vertebrae you can visualize how high their dorsal spinal processes are. Also notice how these processes start to get smaller as we get closer to the lumbar vertebrae.



Moving towards the end of the thoracic vertebrae we come to what is termed the thoracolumbar (T-L) junction. It is a very common area to have VSC disease. As we pass into the lumbar vertebrae we have now made our way into the lower back.

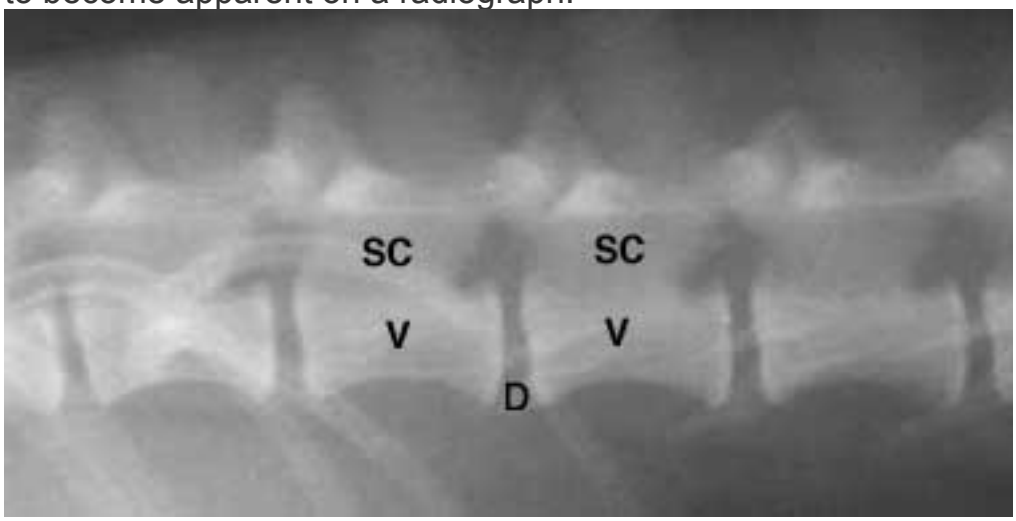


The 7 lumbar vertebrae eventually lead into the sacral vertebrae (S). The fused sacral vertebrae are hard to visualize because they are within the pelvis. After the sacrum we are at the tail.



This side view of a spinal cord model shows 2 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). You saw this same picture, from a different angle, at the beginning of this page.

To keep you oriented, this is the same area on a radiograph (at L1-2). The nerve root comes out of the dark structure that looks like a horse's head. 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.



VNA Theory

Lets 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 VNA 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 its 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 VNA therapy include: