Tending the Wind – Chapter 8
Chiropractic – Part 3
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The spine of dogs and cats is somewhat different from that of humans. All mammals have 7 cervical (neck) vertebrae, but dogs and cats have 13 thoracic, 7 lumbar, and 3 sacral vertebrae whereas humans have 12, 5, and 5 respectively. (The sacrum is one solid structure composed of fused vertebrae.) Humans also have more curvature in the overall shape of their spines to aid in upright load-bearing. And of course there are major anatomical differences around the shoulder and hip areas between bipeds and quadrupeds. Subluxation theory, however, applies equally to both. The High-Velocity Low-Amplitude (HVLA) adjustment may be delivered either manually or using a hand-held device.

Daniel Palmer, sometime after 1910, experimented with performing adjustments using a rubber hammer device called a pleximeter. Similar inventions appear throughout the early history of chiropractic. One of the most commonly used devices today is a spring-activated device called the Activator Adjusting Instrument (AAI), created for a human chiropractic technique – Activator Methods Chiropractic Technique (AMCT). A similar technique for animals which also uses the Activator is Veterinary Orthopedic Manipulation (VOM). This is the technique I use in my practice.

VOM and AMCT both rely on a phenomenon called *facilitation* to locate subluxations. Facilitation refers to an increased excitability of neural pathways in the spinal cord caused by abnormal stimulation patterns from afferent (sensory) neurons. Subsequent afferent stimulation then causes hyperactive efferent (motor) responses, such as muscle spasm and shortening. (Recall that in the impulse-based subluxation theory, joint hypomobility leads to a lack of the mechanoreceptor stimulation necessary for proper down-regulation of nociceptive input to the spinal cord. Abnormal neural patterns are set up in the spinal cord resulting in hyperactive responses to all further sensory input, whether nociceptive or mechanoreceptive.)

Muscle spasm and shortening along the spine can be observed in humans as functional (not anatomical) leg length inequality – the manifestation of facilitation used in AMCT to locate subluxations. In small animals, AMCT isn't practical because dogs and cats have much shorter legs than humans, and you can't tell them to sit still for the required procedures. Luckily, they have another muscle system which humans don't, and it serves as a great reflex indicator of spinal facilitation.

The *cutaneous trunci* is a thin sheet of muscle just under the skin covering the trunk of the body. It is commonly called the "fly-twitch" muscle because of the reflex twitch it exhibits when a fly lands on the skin. This normal reflex is called the *panniculus reflex*, and is triggered by stimulation of certain receptors whose afferent nerves enter the spinal column at the third thoracic through the fourth or fifth lumbar intervertebral spaces. In VOM, a similar reflex involving the cutaneous trunci muscle (*panniculus-like reflex*) is used to locate subluxations. Every spinal joint is tested by using the Activator device placed strategically on each vertebra. Where there is a subluxation, the mechanical stimulus to the joint will cause a reflex twitch of the cutaneous trunci muscle; if there is no facilitation at that level, no twitch will occur. This is a pathologic reflex rather than a normal reflex, occurring only with subluxation and referred to as a "read" in VOM nomenclature. In areas not indicated by this reflex, above T-3 and below L-4 or L-5, we commonly observe reflex twitching of forelimb and hindlimb muscles respectively.

At the same time the Activator is locating subluxations, it is also providing an adjustment (HVLA thrust). To be most effective, the instrument's line of drive is oriented to cause distraction of the joint, either in line with or at right angles to the articular planes. The instrument can then be used to check each joint again for remaining subluxations. This procedure is also done for joints along the limbs. Students of VOM are taught to make two or three passes with the Activator down the spine and key

locations on the limbs. With each pass, secondary subluxations resulting from dysfunction in other areas are cleared, revealing primary subluxations which usually require a series of treatments to resolve.

A common criticism of VOM by manual adjusters is that every joint receives an adjustment, not just the subluxated ones. Traditional chiropractic warns against overadjusting the spine. Normal areas and areas of minor compensation are typically avoided. There is a massively important difference, though, between manual technique and VOM technique which alleviates the concern about overadjusting with VOM. While both methods induce movement in the joint, the intent of manual technique is typically to force the joint beyond its elastic limits, creating joint separation that is often accompanied by cavitation (cracking); the intent of VOM is to induce just enough movement to normalize nerve impulses without stressing tissues. Once nerve impulses are normalized, the body's own homeostatic mechanisms can take over joint healing.

Some measurements have been made in human chiropractic for the forces, speeds, and movements generated during adjustment. The data collected so far suggest that instrument adjusting achieves similar immediate movement of the vertebrae using much less force and more speed. Comparing forces and speeds in the cervical spine[1,2], for example, manual thrusts average around 100 Newtons of peak force with thrust duration times ranging from 80-100 milliseconds; Activator cervical thrusts average around 40 Newtons of peak force with a thrust duration time of about 30 milliseconds. Comparing movements in the lumbar spine[1,3], manual and Activator thrusts both generate about 0.5-1mm translation and 0.5-1° rotation. (Studies need to be conducted that simultaneously compare forces, speeds, and movements all in the same spinal region.) In manual therapy, the joint is taken to its elastic limits before the thrust is applied. Using the Activator, the thrust is applied with the joint in its resting position. The Activator therefore requires less force to achieve the same amount of immediate movement; overall movement is of course greater using manual technique.

The question remains, is it better to take the joint beyond its elastic limits? Is that degree of stretch to ligaments, joint capsules, discs and muscles necessary to break up fibrous adhesions and free the joint? Or is it enough to simply induce the movement needed to restore neuromuscular homeostasis?

Current and future research will help answer these question, but in the real world, as with most things in medicine, some patients respond better to one method, and some to the other. As practitioners, we tend to focus on those methods that work better for our own bodies, and for me that's instrument adjusting. I also prefer using gentler techniques for small animals who can't always tell us when something hurts, and who don't particularly like to hold still for intricate movements. The improvement I see in my patients, and the joy I see in my clients when their pet can jump into the car and climb the stairs again, is the real world evidence for VOM's worth.

VOM has successfully helped pets with a wide range of ailments, including disc herniation, wobbler's syndrome, sciatica, arthritis, partial cruciate tears, lick granulomas, feline hyperesthesia syndrome, and even certain internal disorders. A full exam and appropriate diagnostic tests are necessary to identify the nature of the problem, and to determine if adjustments are appropriate.

Whether joint adjustments are done manually or by instrument, the benefits last much longer when adjacent soft tissues are treated with methods like massage and acupuncture. Their effects are synergistic, providing relaxation and stimulation to all the tissues involved in joint fixation. So don't skimp on those butt rubs!

1. Chiropractic Technique, D. Peterson & T. Bergmann, Mosby 2002, Ch.4 Pg.125-6
2. Biomechanical Characterization of Five Novel Methods of Cervical Spine Manipulation, J Manipulative Physiol Ther 1993; 16(9):573-7.

3. Measurement and Analysis of the In Vivo Posteroanterior Impulse Response of the Human Thoracolumbar Spine: A Feasibility Study, J Manipulative Physiol Ther 1994; 17(7):431-41.