

Applied Kinesiology Chiropractic and Cranial Therapy: About the TMJ

Scott Cuthbert

Abstract: Many health problems arise from a mechanism in the body about which many doctors are unaware: the cranial-sacral mechanism. Members of the chiropractic and osteopathic professions have made a major effort to understand dysfunction in this area and how to correct it. Unfortunately this knowledge has not been widely dispersed, and a majority of individuals continue to suffer with health problems which could be corrected if a larger number of doctors were aware of the wide range of problems developing from disturbances in the mechanics of the human head.

Many of the areas in which application of the cranial concept might be of great benefit are controlled by specialist practitioners in other disciplines who are not yet aware of this very potent and vital system operating in their patients. These specialties include headache and neck pain clinics, paediatrics, obstetrics, dentistry, psychiatry, ear-nose-and-throat doctors, and the general medical practitioner. Other conditions that may be caused by cranial problems are headaches, TMJ dysfunction, hypertension, impaired brain circulation, disturbances in the endocrine and digestive systems, vision, hearing, and general neurologic disorganisation.

Parents and teachers often assign improper labels to children such as 'slow learner', 'poor reader', 'dyslexic', 'poor listener', 'hyperactive', or 'poorly disciplined', not realising that the sensorimotor confusion arising from cranial disturbances underlie each of these conditions. Unfortunately, these patients tend to travel from doctor to doctor receiving only temporary, if any, relief from their condition.

This paper presents a basic clinical approach to Cranial work which has been found to allow good outcomes in cases such as those mentioned.

Indexing Terms: Chiropractic; AK; Applied Kinesiology; George Goodheart.

The Applied Kinesiology Revolution in Cranial Therapy

George J Goodheart Jr DC, the son of a chiropractor and osteopath, was influenced by and a life-long student of his father and his father's friend, Major Bertrand DeJarnette DC, the founder of *Sacro-Occipital Technique*. There are several important and extremely useful additions made by Goodheart to the unique approaches introduced into the chiropractic profession for treatment of the cranium by DeJarnette. (1)

The concept of a *Primary Respiratory Mechanism* (PRM) within the nervous system was conceived over 90 years ago by William Garner Sutherland DO, the grandson of a Scottish immigrant born in 1873. Since that time there has been little conceptual or experimental progress confirming

... the *Primary Respiratory Mechanism* is associated with many clinical presentations, especially 'slowness' in behaviours. *Cranial Therapy* in general and about the TMJ in particular is a powerful tool for chiropractors'



Sutherland's model for cranial-sacral motion. The profound clinical results of cranial treatment have justified its practice, but the time has come for a fundamental change in this model, which Applied Kinesiology (AK) offers. (2)

In recent years, research and theory have highlighted the roles of muscles, joints and nerves in the function of the neuro-musculoskeletal system. This system has been described as the '*Primary Machinery of Life*' as it is how we move and communicate. It is also now acknowledged that the amount of cerebrospinal fluid produced per minute is too small a quantity to have the power to move the cranial sutures, so the CNS does not have the contractile elements nor tensile strength to move itself, and certainly not the whole cranium nor the rest of the body. All motion in the body is a result of muscular action whether striated, smooth or cardiac.

A new AK research paper demonstrates that compromised cervical muscle function and many types of headache are associated, and that the return of muscle strength upon testing after treatment may in fact be an indicator of the efficacy of the therapeutic interventions performed for headache. This paper also records the specific improvements in the *Numeric Pain Scale for Neck and Associated Pain* when AK treatment was given to a cohort of 52 patients. (3)

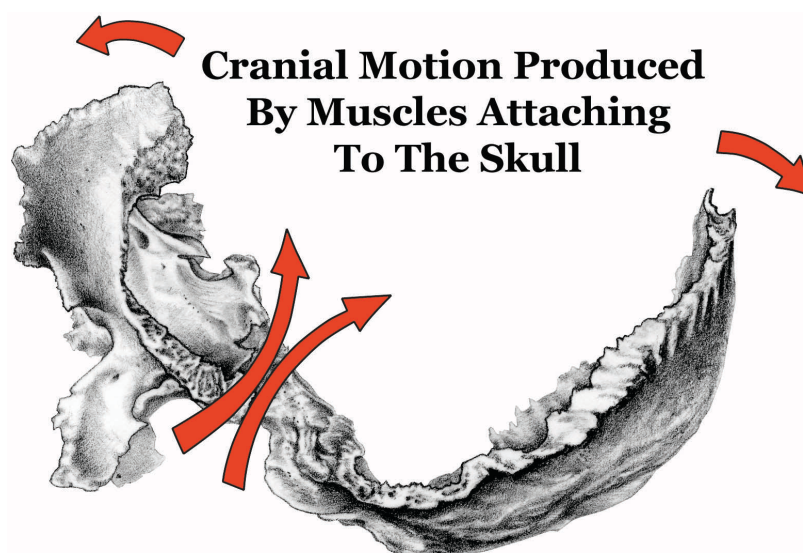
Cranial therapists have been working with patients with headaches for generations ... this paper of Goodheart's is the largest one in AK (and only one of a handful of paper throughout the cranial world) that offers specific evidence regarding the musculoskeletal manifestations of cranial dysfunctions and headache. (4)

With the prevalence of headaches across our population, the discovery of a physical sign (the AK manual muscle test) that is a modifiable co-morbidity of headaches, as well as one that monitors the outcome of manual treatment is really desirable. (5)

Esposito et al also used 'before and after' MRI scans to show that patients with significant herniated discs in the low back could be treated successfully using non-forced cranial adjusting techniques. The outcomes from this conservative applied kinesiology-based method were better than other conservative care methods. (6)

AK Chiropractic offers a fundamental change in perspective from the classical osteopathic and Sacro-Occipital view, that of an '*internally driven*' PRM where an inherent spheno-occipital 'motion' drives the other bones, to an externally driven system where muscles attaching to the cranium driven by the motor neurons of the body move all the bones.

It has been hypothesised that the powerful muscles attaching directly to the cranial bones move rhythmically and in complex patterns, which are capable of exerting significant and constant pulls and pressures on the skull that demand a degree of resilience, flexibility and palpable motion at the sutures.



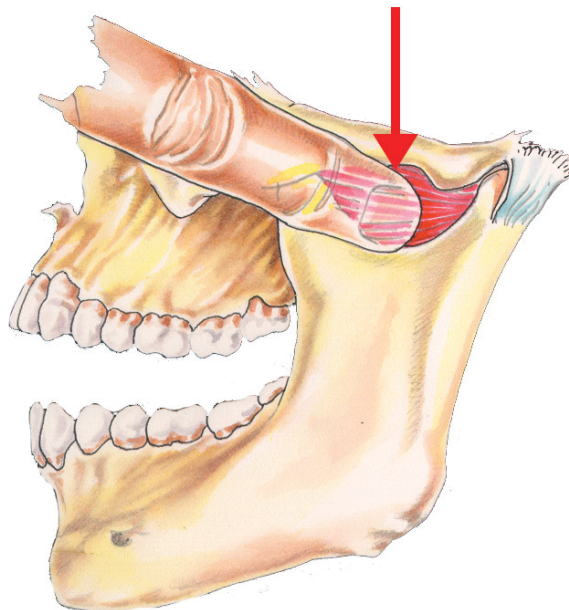
Deficits in strength, endurance, and increased fatiguability have been consistently demonstrated in the muscles that attach to the cranium in patients with whiplash associated disorders, neck pain and headache. Correction of these weaknesses by cranial therapy has been documented for over 50 years. (1, 2, 3, 4, 5)

This is a revolutionary improvement in the approach to, and concepts behind, cranial therapy. In AK we ask: how is '*tennis elbow*' explained without considering the muscles moving the elbow? The cranium should be looked at in the same way, no more mysteriously than the rest of the body.

The earlier belief that the movements palpated in the cranium were driven by a powerful but still unproven PRM meant that the mandible was also rarely addressed in classical osteopathic cranial work. However in AK there is recognition of what is called the *stomatognathic system*, indicating the relationship of cranial mechanics to many other body structures. For instance in the conventional cranial management of whiplash strain, most attention is paid to the soft tissues of the cervical spine. However, as an appendage to the anterior skull, the mobile jaw, if abruptly altered in its function, is capable of straining the entire cranium. (4, 5)

AK Cranial Examination Includes All The Muscles That Move The Head --

**Lateral Pterygoid Of Jaw
Moves The Sphenoid**

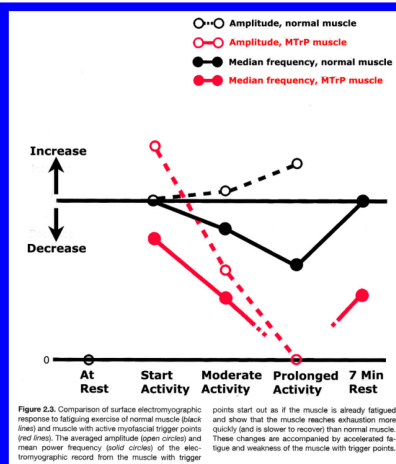
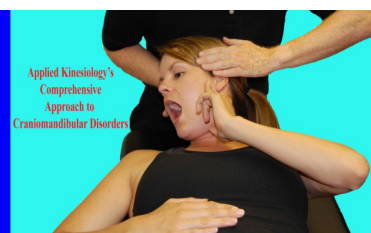


The muscular links with the mandible create a connection between *temporomandibular* dysfunction and *sphenoidal* dysfunction, with influences being possible from either direction. *Trapezius* muscle dysfunction forces the occiput into flexion or extension and normalisation of the strength and function of the muscle must be achieved before treatment to the cranial base can be effective. Changes in *upper trapezius* strength have been demonstrated in patients with cranial faults, whiplash, neck pain and headache. The influence on sutural mobility of a malfunctioning *sternocleidomastoid* or *upper trapezius* muscle would be profound and sutural disturbances are beyond question a physiological occurrence.

TMJ Disorders & and Whole Body Dysfunction -- The Applied Kinesiology Chiropractic Advantage



Lund and colleagues show that in patients with TMD, the painful masticatory muscles do not show an increase in EMG activity, i.e. hypertonicity of the affected muscles is **not present**. Instead, the force of maximal voluntary contractions of the painful muscles is reduced. (Lund et al., 1991)



According to Travell & Simons, “the experimental support for the assumption that activation of muscle nociceptors leads to increased activity in motor neurons is weak.” (Travell & Simons, 1999)

In their discussion of the neurology of muscle pain, nociceptive input from a muscle leads to only transient excitation of neurons, which “**evolves into an inhibition when the input continues for several hours**”.



Most patients who see dentists and chiropractors with TMD have had their problems for at least several hours...**for this reason the most common presentation in clinics that treat patients with TMD-related muscle pain will be inhibition of motor function.**

Although the TMJ is classified as a hinge-type joint its action is much more complex. Opening and closing the jaw is a simple hinge action while side to side jaw movement requires a sliding action of the joint. Chewing food requires a combination of these movements.

This movement is accomplished by complex interaction of four pairs of muscles known as the *muscles of mastication*. You can observe how well nerves control the muscles to function together. Open your mouth wide to one side and snap the jaw closed. Even with this rapid movement the muscles guide the closure so the teeth fit together perfectly regardless of the position the movement started from.

Loose two-knuckle test

The relaxed, fully open mouth should easily admit the first two knuckles (of either hand) between the incisor teeth

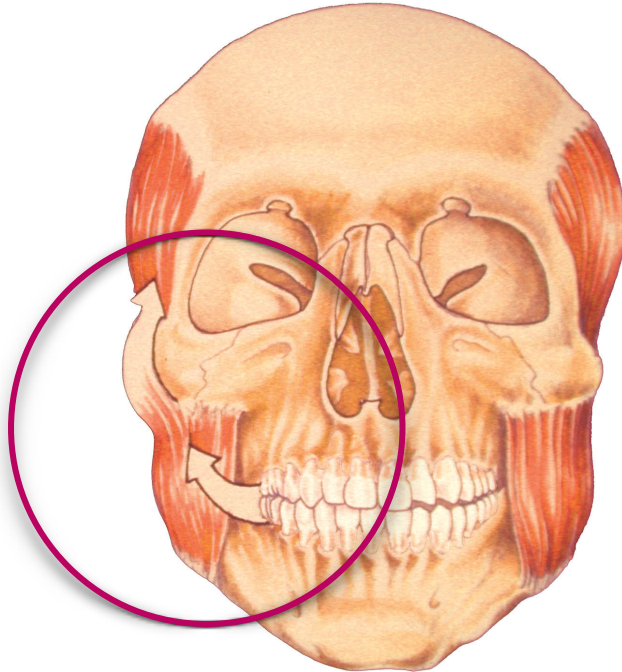


AK Management of TMD



The muscles of mastication are highly organised and strong. Some of the muscles are closers and others open the jaw, but all organise with each other.

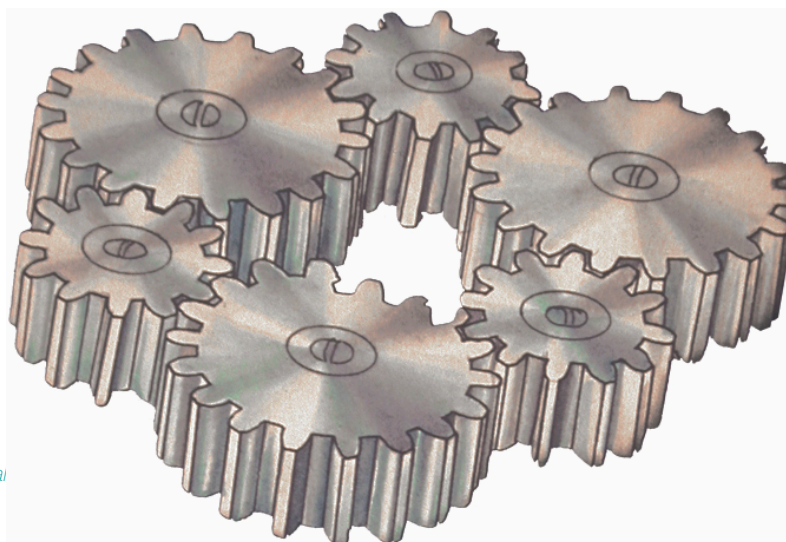
Examples of how mandibular function integrates with the teeth and cranium are demonstrated in the figure below. The right muscles are pulling harder creating strain on the teeth and cranium. There is resulting malocclusion where the teeth are hitting first on the right creating strain on the teeth, jaw, and cranium. This creates a subtle entrapment of cranial nerve V producing an imbalance in the muscles of mastication affecting occlusion and strain on the cranial base and its motion.

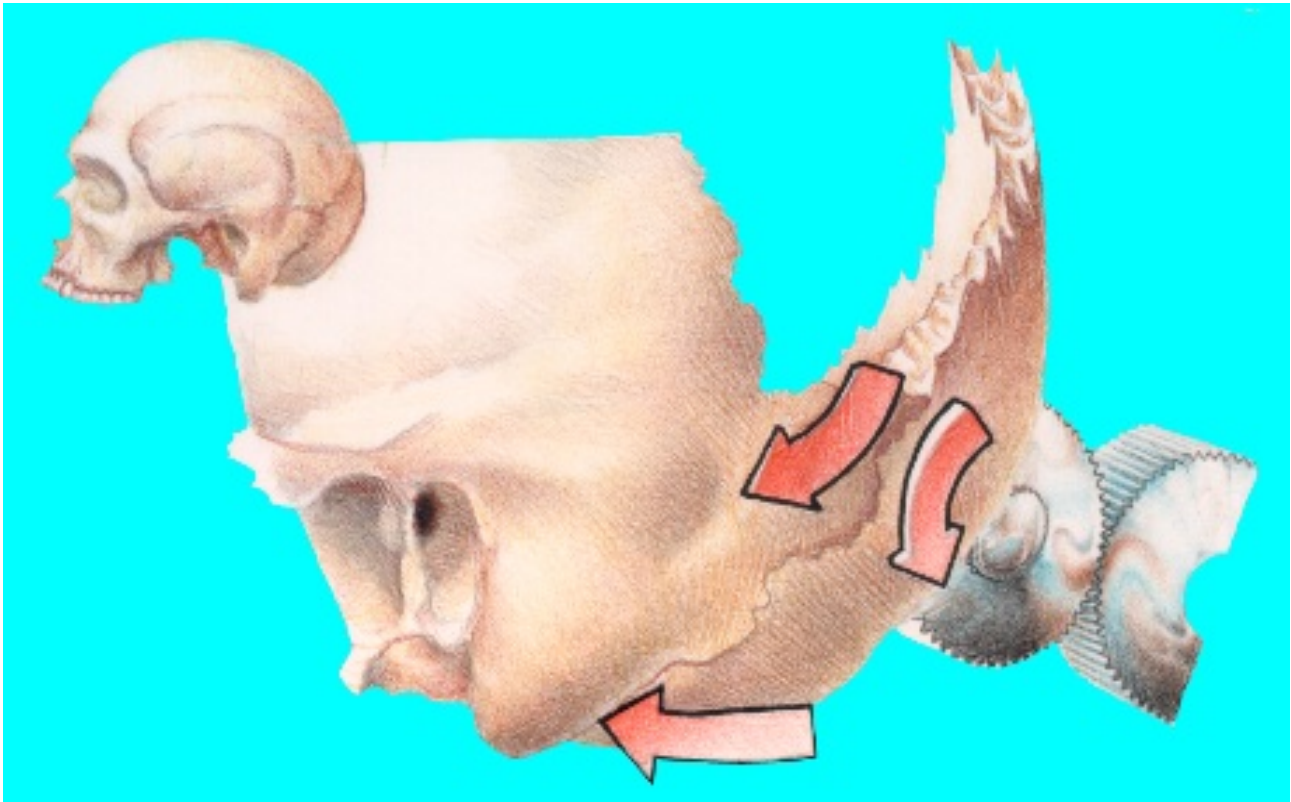


All of these conditions cause and/or perpetuate TMJ dysfunction and cranial dysfunctions.

Although one may think of the two temporomandibular joints only as the joints between the jaw and the head they are actually a small functioning part in a complex of activity measurably going on through the body.

The TMJ works within a closed kinematic chain. The concept of a closed kinematic chain is illustrated by a series of gears. When one gear rotates all of the gears in the chain must rotate. The TMJ is like one gear in the chain. Due to its connection with the teeth, the tongue, the lips and gums, and the functions of chewing, talking, swallowing, eating and speaking, it might be considered that the TMJ is indeed the most important chiropractic joint in the human body.





With chewing or talking the muscles connecting the jaw to the head are contracting and relaxing. Simultaneously the hyoid muscles must be relaxing and contracting in concert with the jaw opening and closing muscles. If it were not so the head would be bopping up and down as the jaw moves. Unfortunately the muscles do not always contract and relax with proper timing. Electromyographic studies have shown that in TMJ and/or cranial dysfunction jaw opening and closing muscles may be firing at the same time, thus fighting each other. One side may be contracting harder than the other causing strain. (3, 4 5)

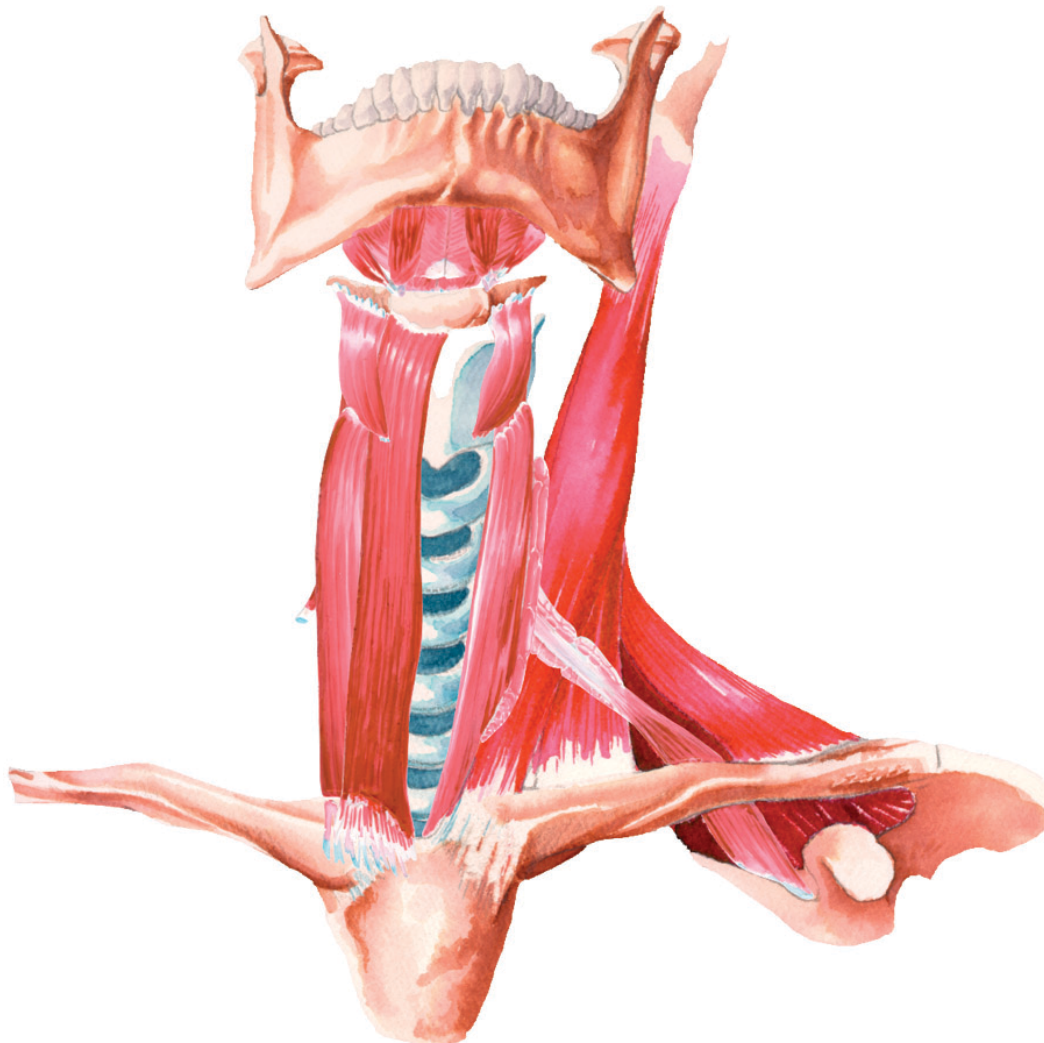
All of the muscles in the closed kinematic chain of the TMJ communicate with each other through the nervous system. The muscles in the back of the neck must organise with the muscles in the front. When tilting the head to look up the muscles in back of the neck contract and the nerves signal the front muscles to relax. These actions and signalling become more complex when forward and backward head motion is combined with head rotation. In most chronic neck pain cases (especially those involving whiplash trauma) treatment of the TMJ dysfunction will be required.

The TMJ examination includes evaluating the dental occlusion, the joint including its articulating disc, and the individual muscles of mandibular movement and mastication. Often the many other remote areas of this vital closed kinematic chain are overlooked. TMJ dysfunction can reciprocally be caused by or perpetuated by disturbances in any of the muscles of its closed kinematic chain.

The muscle organisation within the chain is examined in applied kinesiology by having jaw motion evaluated in opening, closing, and teeth clenching. It may also be evaluated with swallowing, talking, and with the head in different positions.

When dysfunction is observed the muscles that are activated in the offending motion are specifically evaluated. Correction may be needed to the muscle or to the specific nerve that controls the motion. A type of nerve involvement may be subtle entrapment to the trigeminal nerve (V) by a cranial dysfunction. Cranial nerve V controls the muscles of mastication. muscles

are controlled by cranial and spinal nerves so either cranial dysfunctions or spinal subluxations could be causing these problems.



Conclusion

The main message in this discussion is that TMJ problems can be caused by dysfunction in any area of the closed kinematic chain of the human body. Further, TMJ dysfunction is not limited to jaw pain. Because of resulting cranial dysfunctions many health problems, muscle and joint dysfunctions, and organic disorders can develop.

Because the body works as an integrated whole, remote dysfunction is often the cause of TMJ problems. The most reliable and practical method of detecting these interactions is the manual muscle test, while ‘challenging’ or ‘therapy localising/testing’ the TMJ. (3, 4, 7)

It should be mentioned that the *Tufts Dental School* has thoroughly elaborated on these AK chiropractic methods and found them practical and very useful. *Tufts University’s Dental School* has been using manual muscle testing and the methods developed by Goodheart and the *International College of Applied Kinesiology* (ICAK) in the evaluation of patients with TMD for several decades now, and have published a substantial body of research on the relationship between muscle imbalances and TMD. (7)

During the AK treatment of cranial dysfunctions, careful attention is paid to muscular dysfunctions that definitely impact cranial suture mobility. Any attempt to normalise cranial function without appropriate attention to these powerful muscular influences, including the jaw muscles, acting directly on the sutures and therefore on the motion potentials of the cranium, makes results short-lived.

The causes of muscular imbalances are the AK cranial practitioner's bread-and-butter. Doctors using AK not only evaluate the entire body from the feet to the upper neck, but they examine and treat the human head and jaw.

This becomes the chiropractic profession's truly holistic examination.

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About the author

Scott Cuthbert, DC practices in the Philippines and is Associate Editor with the *Journal*. He has served on the Board of Directors of the *International College of Applied Kinesiology USA*. He is the author of three textbooks on applied kinesiology (in addition to 15 papers cited by *Index Medicus*, and over 50 peer-reviewed research papers) on applied kinesiology approaches to functional health problems.

As this paper demonstrates Dr Cuthbert practices chiropractic with Mastery of the AK approach. This paper contains photographs and illustrations taken and compiled by Scott Cuthbert, BA, DC.

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