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Technique Summary: Applied Kinesiology [Updated for 2011]

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HISTORY

Applied Kinesiology (AK) provides an integrated, interdisciplinary approach to health care. George J. Goodheart, D.C., originated AK in 1964.¹⁻² Dr. Goodheart found a technique that could immediately make a muscle that tested weak strong. The technique did not correct all muscles that tested weak but from this initial experience, testing muscles in a precise manner became routine in his examination protocol. The investigation of other causes of muscle weakness and their correction developed into what is currently the practice of AK.

The actual testing of the muscle had been previously and firmly established by Kendall and Kendall,³ who held that a muscle from a contracted position against increasing applied pressure could either maintain its position (rated as "facilitated" or "strong") or break away and thus be rated as "inhibited" or "weak". The testing of muscle strength itself had been widely practiced in manual medicine for decades by such authorities as Daniels, Worthingham, and the use of the MMT for functional conditions continues today with the work of Janda, Chaitow, Sahrman, Bergmann, Lewit, Liebenson, and Hammer.⁴⁻⁹

Each of these researchers uses the MMT to diagnose muscular imbalance. In a sense, the early work of Goodheart and Kendall has influenced generations of practitioners spanning many disciplines and has become consensus methodologies across a broad spectrum of professionals.

Even the American Medical Association has accepted that the standard method of MMT used in AK is a reliable tool and advocates its use for the evaluation of disability impairments.¹⁰

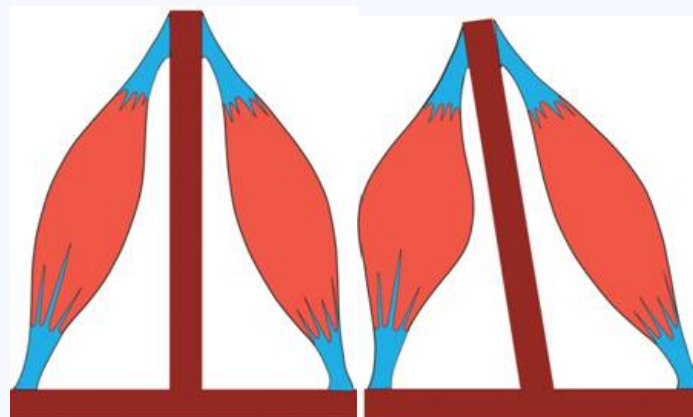


Figure 1. Hypertonic muscle secondary to inhibited muscle and inhibited muscle responsive to chiropractic manipulative therapy (AK model)

Goodheart's work drew a large following of doctors and recognition. He was the first chiropractor officially appointed to the US Winter Olympic Sports Medicine team.¹¹

In 1976 the International College of Applied Kinesiology was founded to promote the research and teaching of AK.¹²

The ICAK began in the United States with a majority of chiropractors as members. There are now chapters in Australia, Austria, Benelux, Brazil, Canada, France, Germany, Italy, Korea, Russia, Sweden, Switzerland, United Kingdom, and the USA. The organization is multi-disciplinary; membership includes medical doctors, osteopaths, dentists, psychologists, and other health care providers who are licensed to diagnose patients. Medical practitioners using AK vary by country. There are nearly 1,000 medical doctors in Germany, for instance, who use AK as part of their diagnostic system.¹³

The first book to describe the value of AK to other professions -- "AK and the Stomatognathic System" -- was authored by Gelb, a dentist, and Goodheart in 1977.¹⁴

Goodheart set the peer review trend for AK by publishing a discussion of dentistry and AK in 1976.¹⁵ Scopp published the first research paper discussing the AK approach to a functional organic disorder with allergy testing in 1979.¹⁶

There are now over 100 papers published in peer-reviewed journals on the methods and outcomes of AK.^{12, 17-30} Few chiropractic therapeutic methods have been investigated or written about as extensively as AK. There have been 35 separate books published about AK methods since 1964.¹²

Since the original discovery, the AK examination system has broadened to include evaluation of the nervous, vascular, and lymphatic systems, nutrition, acupuncture, cerebrospinal fluid function and many other controlling or disturbing factors that influence health and neuromusculoskeletal function.

Each of these areas of human function have been shown to effect the muscular system, and AK and allied health systems' research evidence in this regard is constantly growing.^{12, 31}

Three areas that have been shown to effect muscle function are the cranial system, the meridian system, and nutritional imbalances.

Nutrition and Adverse Chemicals

The effect of **nutrition** and chemicals on health and muscle function is evolving. Modern science is constantly discovering new information furthering this knowledge.

Nutritional items, when chewed, stimulate the nerve endings in the mouth. This may have an immediate effect on muscle function. For example, if the muscle clinically associated with the liver is weak and vitamin A is indicated for liver support, chewing vitamin A or a carrot may cause immediate and dramatic improvement of the muscle's function, as indicated by the MMT. Conversely, if a toxic chemical is causing a problem in the liver, a muscle associated with the liver will test poorly immediately after the substance is chewed or inhaled.

All aspects of the examination should correlate and lead to the final **diagnosis** and recommendation for treatment. Applied kinesiology muscle tests for nutrition and chemicals do not take the place of a complete, thorough examination; rather, they augment it by evaluating how the body responds to the substance(s) being tested. This adds a functional evaluation that takes into consideration the biochemical individuality of people.

Travell and Simons for instance showed that in the case of myofascial trigger point formation, correction of nutritional "perpetuating factors" can be the most important part of therapy.³²

Systemic perpetuating factors for trigger point problems encompass many conditions that compromise muscle energy metabolism. These conditions include anemia, low serum ferritin, inadequate thyroid function, vitamin B1 (the energy vitamin) inadequacy, folic acid, and/or vitamin B12 inadequacy.³² Frequently, several of these are present at once, and the laboratory reports low-normal values.

Travell and Simmons are clear in their insistence that nutritional imbalance has to be restored if myofascial pain is to be adequately dealt with:

“Nearly half of the patients whom we see with chronic myofascial pain require resolution of vitamin inadequacies for lasting relief.” In their opinion, nutritional factors must be considered in most patients if lasting relief of pain is to be achieved.

Cranial Bone Movement and the MMT

It was originally thought that the skull was a solid mass primarily protecting the brain. In reality, there is minute predictable movement between the bones that is necessary for normal function of the nerves and spinal fluid.³³ Spinal fluid surrounds the brain and spinal cord, providing nutrition, lubrication, and hormone movement. A bump or other type of strain to the head can jam the skull bones, causing abnormal movement. Improper nerve function may result that can cause problems in remote organs or other body structures.

There are several methods for evaluating skull function that have been developed in AK examination. The doctor may test a muscle, apply a challenge to bones of the skull, and then re-test the muscle. The patient may be asked to take a deep breath and hold it, and then a muscle is re-tested to determine any change. The doctor may have the patient touch various areas of their skull while a muscle is tested. Dysfunction of the skull is called a cranial fault. If one is found, a specific gentle pressure, the direction of which is determined by the MMT examination, will be applied to the skull, usually with a specific phase of respiration. If the correction is successful, there will be an immediate improvement of the MMT. Research supporting the functional integration of the neuromuscular system and the craniocervical system has presented by the ICAK, Walther and Goodheart.^{1,12,34}

Meridian Therapy

The Chinese developed a system of treating disease and maintaining health that balances the energy in the body's meridians. In modern times, **acupuncture** – or more accurately “meridian therapy” – has proven a valid method of treatment. Dr. Goodheart and the ICAK have provided some of the first advancements in this treatment in the Western world.³⁵ By using AK techniques, the flow of energy in the meridians can be evaluated and corrected if out of balance. Correction can be made by many methods of stimulation, such as electrical, laser, needles, small tape patches with metal balls, or simply by mechanically stimulating certain spots. There is usually an immediate improvement in muscle function after meridian balancing. A number of recent published reports have demonstrated the effectiveness of the AK system of analysis for acupuncture system dysfunctions.³⁶⁻³⁸

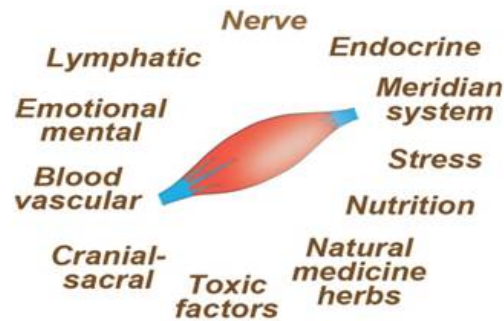


Figure 2. Abnormal results of the manual muscle test, whether the muscle is weak or hypertonic, may indicate abnormal involvement of any of the factors surrounding it. A change in muscle function when specific stimulation or therapy is applied to one of these elements also indicates dysfunction of the surrounding factors.

PRINCIPLES & THEORIES

When muscle dysfunction is found the doctor proceeds with examination to find what therapy restores proper function. Application of the therapy, if successful, immediately returns proper muscle function. Re-examination at a later time determines if the correction is maintained. Thus the system (1) finds disturbance, (2) determines how to fix it, (3) determines if the corrective effort is successful and, most important (4) determines if the correction is stable. If the correction is not stable, further examination is done to find the reason so it can be eliminated.

But what distinguishes AK is its emphasis upon proprioceptive responses of the muscle rather than the strength of the muscle itself. It essentially sees muscle function as a transcript of the central integrative state of the anterior horn motoneurons, summing all excitatory and inhibitory inputs.³¹ In other words, the locus of dysfunction ultimately rests with the nervous system. A procedure called therapy localization, strictly diagnostic, seeks a

change of muscle strength when the patient's hand is placed over an area of suspected involvement. Challenge defines a mechanism to test the body's ability to cope with external stimuli, again assessed by muscle testing.

Challenge is a diagnostic procedure unique to AK that is used to determine the body's ability to cope with external stimuli, which can be physical, chemical, or mental. Cranial challenge (for instance) has been described in the literature previously.³⁹⁻⁴⁰ After an external stimulus is applied, muscle-testing procedures are done to determine a change in the muscle strength as a result of the stimulus. Through this approach, ineffective therapies that produced no improvements in muscle strength are rejected and only those that elicit a positive muscle response are used. This guides the treatment given to a patient.

Therapy localization is a diagnostic procedure unique to AK that consists of placing the patient's hand over areas of suspected involvement and observing for a change in the MMT. This method is hypothesized to assist the doctor in finding areas that are involved with the muscle dysfunction found on MMT and has been used clinically for over 30 years.¹ Pollard et al in a recent literature review presented some of the research about the AK concept of therapy localization.⁴¹ Collectively these data suggest that stimulating the skin and the cutaneomotor reflexes can produce changes in muscle function.

Diagnostic Philosophy

The AK diagnostic philosophy is that if we understand, identify and quantify the abnormal features involved in a patient's presenting disorders from a broad multi-systems physiological perspective, this will lay the foundation for better differential diagnosis and treatment. It is the AK contention that understanding the underlying processes of human illness and disorders as well as their development over time will direct the development of specific and relevant treatment strategies. In AK, we have developed and tested new treatment strategies for many functional disorders and this process, like all research, is on-going.

Based on the evidence to date, management of complex motor disturbances, functional illness and illness behaviors, stress-induced diseases, chronic pain disorders and postural instability should address not only impairments but also the source of altered somatosensory input (e.g., impaired muscle function and strength, painful and restricted joints). Thus, AK advocates a multi-model program with treatment inclusive of spinal manipulative therapy (SMT), cranial manipulative therapy, specific muscle testing and correction, biochemical evaluation and treatment, and psychosocial evaluation and treatment in order to improve muscle dysfunction (reflective of neural dysfunction) throughout the body in a holistic way.

Since 1964 the AK model has aimed to integrate the physical and psychosocial manifestations of musculoskeletal pain. This integrative model is over-do in the conceptualization and investigation of musculoskeletal pain and the causes of the traditional chiropractic subluxation and will provide a frame work for future investigation of musculoskeletal conditions. This model will also provide an evidence-based basis for the integration and appropriate timing of treatments directed toward both physical (biological) impairments and psychological factors. It is suggested that this integrated approach will be the way forward in the management of musculoskeletal pain rather than the dichotomous separation of physical, biochemical, and psychological factors that so often occurs in research and practice.

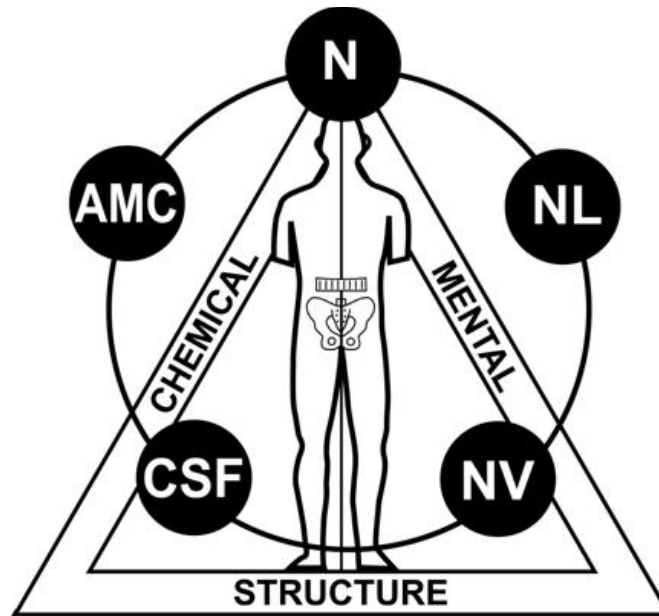


Figure 3. The “Triad of Health” in AK suggests that structural, biochemical, and psychosocial factors are components in functional disorders that are amenable to chiropractic treatment.

Such is to propose that the AK technique offers an important diagnostic tool to supplement those already in place. In considering how acupuncturists focus upon meridians, physiotherapists upon rehabilitative exercise, naturopaths upon nutrition, and chiropractors themselves may in some instances devote their attention to the articulations, AK does not overrule the concept of subluxations but rather implies that subluxations may be attributed to areas in addition to the spine. This allows for an integrative model of chiropractic healthcare to be developed:

1. It frees the profession from having to limit the concept of subluxations strictly to the spine or to joint aberrations.
2. It helps to overcome popular conceptual limitations of chiropractors as merely practitioners who administer only high-velocity thrusts.
3. It accommodates the application of physical modalities outside of the spine and, as such, invites closer collaborations of chiropractors with osteopaths, dentists, physiotherapists, **massage** therapists, psychiatrists, and acupuncturists.
4. By returning the focus to neurological imbalance, it immediately allows such major determinants of health as nutrition and stress to become integrated with chiropractic's central tenet and message. No longer do nutrition and emotional elements appear as adjunct (and arguably alien) concepts which are difficult to rationalize with the more traditional chiropractic concepts of subluxation.
5. It recognizes that many sources of irritation lie outside of the spine, such that reflexes often described by chiropractors as "somatovisceral" may in fact be quite the opposite; i.e., a subluxated vertebra could be the result of a visceral disturbance. In this manner, as pointed out by Carpenter, Hoffman and Mendel, the vertebral subluxation could both initiate and reflect neural dysfunction, the latter being the ultimate indicator of compromises to health.⁴²

a) Peritonitis, gastric ulcer, and renal calculus usually were found in the muscles overlaying the irritated viscera, first described by James McKenzie in 1909.⁴³

b) Irritation of the abdominal viscera or stimulation of the visceral nerves elicited skeletal muscle contractions as reported by Miller and Waud in 1925 and Downman and McSwiney in 1946.⁴³

These reflexes were ultimately described by Kuntz in 1953 as visceroskeletal or viscerosomatic in nature.

It is abundantly clear that further research addressing numerous aspects of AK is clearly warranted. Critics of AK must be mindful that numerous errors in its application and interpretation have hindered its more widespread acceptance.⁴⁴⁻⁴⁶

TRAINING

After many years of fielding problems from uneducated people stating they used applied kinesiology, the ICAK trademarked the term Professional Applied Kinesiology. To be considered a Professional Applied Kinesiologist (PAK), a person must be a doctor licensed to diagnose. They must also

satisfy ICAK **continuing education** credit requirements. Most members of the ICAK-USA have taken a basic course that takes over 100 hours of classroom study and practice to complete. A basic proficiency exam in AK must be passed at the conclusion of the course. A minimum of 300 hours of AK instruction, passage of written and practical examinations, and submission of two (2) original research papers are required to become a Diplomat of the International Board of Applied Kinesiology (DIBAK).

GOALS

Due to the uniqueness of AK methodologies (its breadth and the number of other health care modalities integrated into its system of diagnosis and treatment) AK will continue to intrigue clinicians who wish to integrate broad methods of examination and treatment into their treatment regimes. There are particular difficulties involved when evaluating patients with chronic pain and stress-induced diseases. Often biomechanical adaptations and compensations have advanced to a stage where biochemical, lymphatic, structural, neural, and psychological interfaces are co-present and abundant. Each of these cofactors affects the choice of protocols and this requires a broad foundation of clinical screening tests. For these reasons it is important to be able to screen for the presence of these factors, and AK provides one means for doing this.

EVIDENCE

Many of the tenets of AK theory pertaining to muscle activity and pain can be recognized in the widely recognized Gate Control Theory of Melczak and Wall,⁴⁷ the overall concepts having been elegantly presented by Schmitt and Yanuck.³¹ Altered patterns of muscle activation with chronic pain have been identified with idiopathic and whiplash-associated neck pain,⁴⁸ lumbar pain,⁴⁹ and inhibition of the quadriceps muscle in patients with knee pain.⁵⁰ At the same time, **manipulation** of the sacroiliac joint has been shown to reduce the inhibition of knee extensor muscles.⁵¹

Numerous basic research investigations have been able to support the **validity** and wisdom of manual muscle testing as a diagnostic tool through two approaches: (1) linking it to objective outcome measures, and (2) demonstrating reflex relationships between organ and muscle in the experimental rat.

Tying weak and strong muscle testing results by the clinician to objective outcomes, an essential component for establishing their validity, has been strikingly demonstrated by the observations of Leisman and coworkers. Using a force transducer and electronic goniometer, they found patterns of force and displacement corresponding to the testing of strong and weak muscles in healthy subjects,⁵²⁻⁵³ the model shown to be accurate 98% of the time in 738 muscle tests compared to judgments of clinicians with more than 5 years of experience.⁵³ In another group of subjects, distinct patterns in somatosensory evoked potentials (SEP) were identified in the contralateral components to muscles that tested weak, again suggesting a neurologic basis for muscle testing.⁵⁴

The other component for establishing validity—interrater reliability—has been supported by numerous observations in a literature review by Cuthbert and Goodheart,¹⁷ and in the patient-initiated testing method by Hsieh and Phillips.⁵⁵

Organ and muscle relationships could be found in the investigations of Sato, who showed that rising phases of intravesical pressure involving the bladder of the anesthetized rat were accompanied by oscillatory bursts of activity in recordings of EMG activity from the periurethral skeletal muscle.⁵⁶ Elsewhere, the visceromotor response to colorectal distention in the rat was found to be inhibited by simultaneous jejunal distention, mimicking what is found in therapy localization and offering further clues to the understanding of mechanisms of muscle inhibition that might be found in muscle testing.⁵⁷

In broader terms, Applied Kinesiology suggests that subluxations might result from 3 areas of concern, which comprise chemical and mental elements in addition to structural.⁵⁸ It recognizes how nutritional,⁵⁹ hormonal,⁶⁰⁻⁶¹ and emotional⁶¹⁻⁶³ elements influence neural function as reflected by an established muscle testing protocol^{3-4, 58} whose reliability and validity have recently been shown.¹⁷

The most comprehensive coverage of the research literature substantiating AK methods can be found on numerous websites of the International College of Applied Kinesiology, emphasizing numerous case studies that form the building blocks for future research.¹² Further research and reviews of applied kinesiology are listed at the National Library of Medicine, where AK research has now been given its own MESH heading.⁶⁴ An early overview of AK has been provided by Perle.⁶⁵

What needs to be understood is that several muscle testing protocols which have appeared^{45-46, 66-70} have not adhered to this protocol and as such should never be confused with the methods employed in AK.

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