

Applied Kinesiology: Point/Counterpoint

RESEARCH BASIS FOR APPLIED KINESIOLOGY

From the International College of Applied Kinesiology

The International College of Applied Kinesiology has embarked over a 10-year period on an ambitious program of funded research that has paid handsome dividends in objectively supporting many of the ideas in the practice of AK. The body of work has investigated basic mechanisms of action, objectified muscle testing procedures, including validity and reliability issues, and evaluated clinical outcome. These all have led to the development of models to objectively explain therapeutic benefit. Among the principal papers published over this period are:

Leisman G. Cybernetic model of psychophysiologic pathways: II. Consciousness of tension and kinesthesia. *Journal of Manipulative and Physiological Therapeutics* 1989, 12(3):174-191.

This paper described a series of experiments directed toward the following questions: a) Do signals from musculotendinous receptors reach consciousness? b) Does feed-forward information of muscular force and expected extent of voluntary movement exist? To answer these questions, data from voluntary compression of springs and strain gauges have been analyzed in healthy young subjects. By successive elimination of information from other sources, it was possible to verify that receptors in muscles and tendons do signal movement magnitude and muscular tension to the cerebral cortex, and that this information does reach consciousness. There also exists a feed-forward mechanism signaling parameters of voluntary contraction. However, it was unclear whether peripheral, subcortical or intracortical loops are directly involved.

Leisman G. Cybernetic model of psychophysiologic pathways: III. Clinical impairment of tension and kinesthesia. *J Manipulative and Physiological Therapeutics* 1989 12(4):275-280.

It was unclear whether peripheral, subcortical or intracortical loops are directly involved between receptors in muscles and tendons and the cerebral cortex in signaling movement magnitude and muscular tension information. Previous experiments have indicated that this information does reach consciousness. Data from voluntary compression of springs and strain gauges were analyzed in patients with unilateral focal lesions of the cerebral hemispheres. It was found that the perception of signals of muscular tension is abolished by lesions of the contralateral cortex near the central sulcus. It was concluded that the possibility exists of separate cortical projection areas for kinesthetic signals from muscles and from joints.

Leisman G, Shambaugh P, Ferentz AH. Somatosensory evoked potential changes during muscle testing. *International Journal of Neuroscience* 1989;45(1-2):143-151.

Fifteen naive subjects with no known neurological problems were tested by means of manual muscle testing to determine two "strong" and one "weak" muscle on a limb contralateral to the stimulated side. Somatosensory evoked potentials (SEP) were then recorded from contralateral median nerve

stimulation while a naive tester tested the three previously identified muscles. In all subjects the baseline (no muscle test) and control "strong" muscle test recordings were comparable while the recording from the "weak" muscle test showed increased amplitudes in contralateral layer components. These findings suggest a neurologic basis for manual muscle testing.

Lawson A, Calderon L. Interexaminer Reliability of Applied Kinesiology Manual Muscle Testing. *Perceptual and Motor Skills*, 1977, 84, 539-546.

Two trials of the inter-examiner reliability of AK manual testing were conducted. In the first trial three clinicians, each with greater than 10 years of experience with muscle testing procedures, tested 32 healthy individuals to determine their agreement on the strength/weakness of right and left piriformis and right and left hamstring muscles. Significant agreement between examiner was found for piriformis muscles, but little significant agreement was noted when hamstrings were tested. In a second study, the same three examiners tested 53 subjects for "strength"/"weakness" of the pectoralis and tensor fascia lata muscles bilaterally. Significant inter-judge agreement was found for pectoralis muscles, but no significant concordance could be found when focusing on the tensor fascia lata was examined.

Leisman G, Zenhausern R, Ferentz A, Tefera T, and Zemcov A. Electromyographic effects of fatigue and task repetition on the validity of strong and weak muscles estimates in applied kinesiology muscle testing procedures. *Perceptual and Motor Skills*. 1995, 80, 933-946.

The paper compended six independent studies supporting the following: (a) "Weak" muscles tested by AK muscle-testing procedures are a fundamentally different state than "strong" muscles tested by AK procedures. (b) Muscles testing "weak" by AK muscle testing procedures are fundamentally different than muscles in fatigue. (c) AK muscle testing procedures can be objectively evaluated. (d) One can plot the course and effect of treatment over time objectively.

Perot C, Meldener R, and Gouble F. Objective measurement of proprioceptive techniques consequences on muscular voluntary contraction during manual muscle testing. *Agressologie*. 1991, 32(10), 471-474.

This French study measured the electrical activity in muscles. It established that there was a significant difference in electrical activity in the muscle, that corresponded with the difference of strong versus weak muscle testing outcomes kinesiology. It further established that these outcomes were not attributable to increased or decreased testing force from the clinician during the tests. In addition, the study showed that manual treatment methods used by applied kinesiologists to assess the level of tone of spindle cells in the muscle are in fact capable of creating a reduction in the tone of the muscle.

Leisman G, Frankenthal Y. Interexaminer reliability and validity of applied kinesiology manual muscle testing. *Perceptual and Motor Skills*. 1999 (in press).

Two trials of the interexaminer reliability of AK manual testing were conducted. In the first trial three clinicians, each with greater than 10 years of experience with muscle testing procedures, tested 30 healthy individuals to determine their agreement on the strength/weakness of right and left piriformis and right and left hamstring muscles while recording surface Integrated EMG (IEMG). Significant agreement between examiners was found for piriformis muscles, but little significant agreement was noted when hamstrings were tested. In a second study, the same three examiners tested 30 subjects

for "strength"/"weakness" of the pectoralis and tensor fascia lata muscles bilaterally. Significant inter-judge agreement was found for pectoralis muscles, but no significant concordance could be found when focusing on the tensor fascia lata was examined. The results were consistent with the IEMG findings.

Motyka T.M, Yanuck SF. Expanding the neurological examination using functional neurologic assessment, part I: Methodological considerations. *International Journal of Neuroscience*, 1999 (in press).

Manual assessment of muscular function in AK was examined as a clinical measure of neurologic function. A review of the literature revealed methodological problems with previous studies of AK as a form of neurologic assessment. It was noted that research designs that do not reflect clinical practice and principles of AK are common in the literature. The principles of AK were outlined and recommendations made that future research reflect more accurately the clinical practice of functional neurologic assessment and applied kinesiology.

Schmitt WH Jr, Yanuck SF. Expanding the neurological examination using functional neurologic assessment, part 2: Neurologic basis of applied kinesiology. *International Journal of Neuroscience*, 1999 (in press).

Functional Neurologic Assessment and treatment methods common to the practice of applied kinesiology were presented. These methods are proposed to enhance neurological examination and treatment procedures toward more effective assessment and care of functional impairment. A neurologic model for these procedures was presented. Manual assessment of muscular function is used to identify changes associated with facilitation and inhibition, in response to the introduction of sensory receptor-based stimuli. Muscle testing responses to sensory stimulation of known value are compared with usually predictable patterns based on known neuroanatomy and neurophysiology, guiding the clinician to an understanding of the functional status of the patient's nervous system. These assessment procedures are used in addition to other standard diagnostic measures to augment rather than replace the existing diagnostic armamentarium. The neurophysiologic basis and proposed mechanisms of these methods were reviewed.

Schmitt WH Jr, Leisman G. Correlation of applied kinesiology muscle testing findings with serum immunoglobulin levels for food allergies. *International Journal of Neuroscience*, 1998 (in press).

This pilot study attempted to determine whether subjective muscle testing employed by AK practitioners, prospectively determined those individuals with specific hyperallergenic responses. Seventeen subjects were found positive on AK muscle testing screening procedures indicating food hypersensitivity (allergy) reactions. Each subject showed muscle weakening (inhibition) reactions to oral provocative testing of one or two foods for a total of 21 positive food reactions. Tests for a hypersensitivity reaction of the serum were performed using both a radio-allergosorbent test (RAST) and immune complex test for IgE and IgG against all 21 of the foods that tested positive with A.K. muscle screening procedures. These serum tests confirmed 19 of the 21 food allergies (90.5%) suspected based on the applied kinesiology screening procedures. This pilot study offers a basis to examine further a means by which to predict the clinical utility of a given substance for a given patient, based on the patterns of neuromuscular response elicited from the patient, representing a conceptual expansion of the standard neurological examination process.

Esposito V, Esposito C, Leisman G. Nonforce manual therapeutic effects on disc herniation with real-

time magnetic resonance imaging. *Journal of Manual and Manipulative Therapy*. 1999 (in press).

A posttraumatic herniated nucleus pulposus (HNP) patient was treated by pyramidally shaped blocks strategically placed under his right side. One block was placed under the right posterior iliac spine and the second was placed under the acetabulum on the right immediately prior to the patient being placed in an MRI chamber. Imaging occurred in real-time during the treatment of the patient and results show significant changes in the patients HNP condition. This study indicates the need to perform clinical trials of viable non-surgical alternatives for the treatment.

Nagatomo S, Leisman G. An east-asian perspective of mind-body. *Journal of Medicine and Philosophy*. 1996, 21, 439-466.

The dilemma of how the mind obtains knowledge about the material is examined from the vantage point of the living organism operating with its own forms of electrochemical energy whose very organization may be the essence of consciousness and self-awareness. The role of mind in these processes becomes uncertain. While these strides are made in solving what may be called the body-stimulus problem, the classical mind-body problem remains as controversial as ever. We seem no closer to understanding how information in the nervous system is brought into awareness. This multidisciplinary paper addresses some of these issues. The technical and theoretical aspects of Life Force vs. neuronal transmission vs. issues in continuum neurophysics, fluidity vs. particulateness, the unity of opposites vs. discrete boundaries vs. either/or dualism of the West, conceptual vs. syntactical and the unity of opposites are issues that are examined from the clinical vantage point.

In addition to the already published or soon to be published studies, numerous other projects have been completed and are being prepared for publication. These include clinical outcome studies of the effects of AK on migraine as well as biomechanical studies on force/displacement analysis of applied kinesiology muscle testing.

Additionally numerous doctoral students, both in the United States and abroad are choosing to investigate the theory and practice of AK to create a broader data base of objectively understanding its mechanisms of action.

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