



## Objective Data through Proper Use Of Instrumentation: Proving Soft Tissue Injury with Surface EMG and Range of Motion

By David Marcarian, M.A.

Recently there has been a major shift in the world of insurance and worker's compensation. Insurers are no longer prepared to accept the doctor's "opinion" that chiropractic care is necessary for a patient, but demanding proof that care is needed. Without objective data they are more often than not refusing reimbursement. Instrumentation is one way of providing that data. Surface Electromyography (sEMG) is a court-validated, research-validated tool which chiropractors can use to show insurers, courts of law and the patients themselves that there is injury, chiropractic care is necessary, and the outcome of that care.

Instrumentation also has other uses. It can be used to expose unethical patients, those who magnify their symptoms in order to claim a large award. Also, through instrumentation, doctors are able to see how effective their care is, or if they need to change their treatment in any way to bring about a more positive outcome.

### What is Surface EMG?

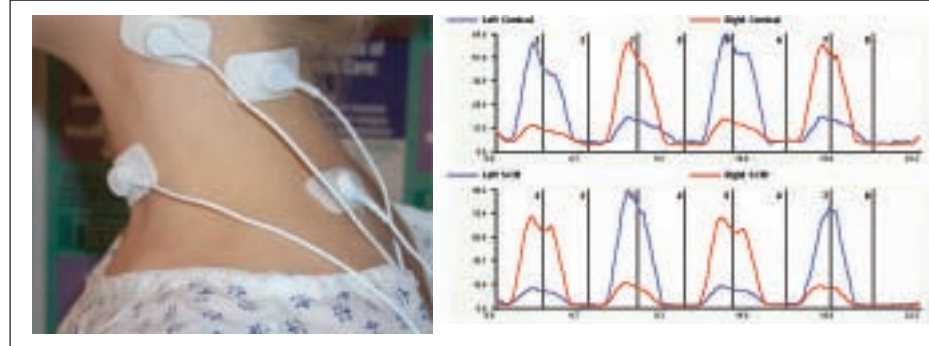
Surface Electromyography (sEMG) is the technique for measuring levels of muscle activity. It utilizes technology very similar to the EKG, but with significantly greater sensitivity. When a muscle contracts, electrical activity is generated as action potentials propagate along the muscle fibers. The sEMG is essentially a very sensitive "voltmeter" for measuring a summation of these depolarizations.

### Static vs. Dynamic Surface EMG

With Static scanning sEMG, two hand held probes are touched to the skin (in a manner similar to a stethoscope) bilaterally at various points along the spine as the patient stands in a neutral posture. A "quick measure" of muscle tension at these points is gathered. (See Fig 1) Typically, there are 12 measures taken from C2 to L5. The results are presented as a torso graph

with the bar length proportional to muscle activity. The most recent research requires the test be performed standing, as loading the spine brings out the greatest abnormalities.

Static sEMG only takes 2 minutes, and is extremely valuable for patient education, screenings, tracking progress, and evaluating for scoliosis and short leg phenomenon. It is not recommended on its own for documenting soft tissue injury, and must be augmented with Dynamic sEMG and dual inclinometry for injury evaluation.



Cervical electrode placement and normal 4 channel rotation.

With Dynamic SEMG, electrodes are attached to the skin, and muscle activity is measured and graphed as the patient moves through various ranges of motion. Dynamic evaluations are necessary for PI/MVA cases, and whenever documentation is required to demonstrate the need for continued care or supports symptom magnification. Due to the fact that an individual may appear normal in a standing posture, in a Static sEMG exam, dynamic motion (as in forward flexion or rotation) will elicit the abnormal muscle bracing that occurs in response to pain and soft tissue injury. It significantly augments range of motion measures by providing an objective measure of effort. Limited range of motion without excessive muscle bracing indicates possible symptom magnification. Excessive muscle bracing, which is the body's natural response to pain correlates with limited range of motion if soft tissue injury is present.



ROM-1. Computerized dual inclinometer.

### Validity of Surface EMG

After battling with insurers for 19 years, validity for surface electromyography has finally been established. In 2006, a landmark Superior Court decision in Florida established both Static and Dynamic sEMG as valid tools for assessing soft tissue injury.

In 2003, the Florida legislature enacted a law that authorized the Florida Department of Health (DOH) to "adopt by rule, a list of diagnostic tests deemed not to be medically necessary for use in the treatment of persons sustaining bodily injury covered by personal injury

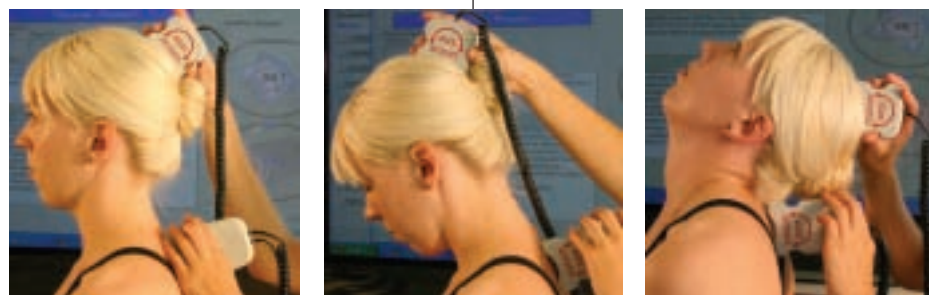
efficacious as a treatment tool was not useful in diagnosing injury.

On the other hand I was able to provide substantial research and more recent journal articles on the efficacy of sEMG on behalf of the petitioner (Dr. Merritt). They were submitted to the state DOH but the state ignored this evidence arguing it was biased because I was a "manufacturer." My attorney, however, was able to show the court that none of this research and papers had my name on them so they were accepted by the judge as evidence. I also testified as an expert on sEMG equipment and research supporting its clinical value. The state's attorney tried everything he could to invalidate my testimony but he was not able to either discredit me as an expert or the data I presented.

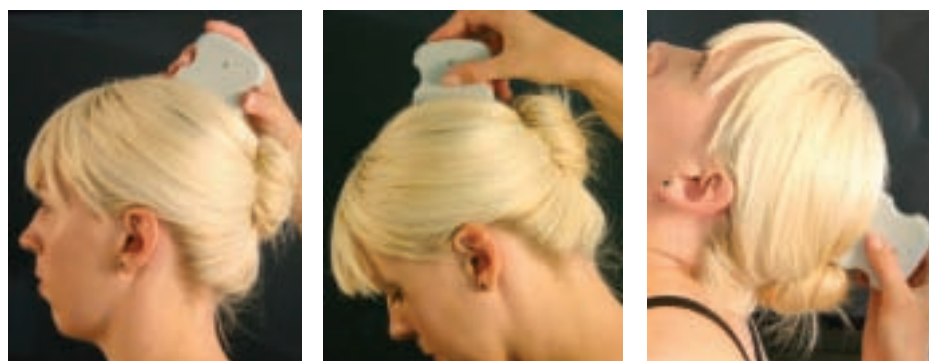
The Administrative Law Judge, after weighing all the evidence, concluded that sEMG should not have been included in the list of diagnostic tests that were not medically necessary. In her ruling she stated that the evidence "demonstrates that SEMG has medical values for use in the treatment of persons sustaining bodily injury... therefore its inclusion on the list of medically unnecessary tests is arbitrary and capricious..."

The Department of Health and the major insurance companies appealed the decision, but on January 5, 2006 the Florida District Court of Appeal affirmed the Administrative Law Judge's decision "that surface EMG testing has significant medical values as a diagnostic tool with respect to the treatment of a patient suffering from injuries like those arising out of a motor vehicle accident..."

For more details on the case, please visit [www.myovision.com](http://www.myovision.com) under "re-



Proper use of range of motion: Dual inclinometers required.



Improper use of range of motion: Devices with single inclinometers are NOT acceptable based upon AMA Guidelines.

protection benefits..." In 2004 the DOH included in this rule, surface electromyography as one of the four diagnostic tests "deemed not be medically necessary" in personal injury cases. This rule relieved insurance companies from reimbursing for costs of the sEMG procedure covered under PIP in Florida.

Dr. Richard Merritt, a Florida chiropractor, challenged the rule and the case went to a full evidentiary hearing. The Department of Health and the insurance companies submitted as their evidence old journal articles and an expert who testified that sEMG, though

search". This crucial case and its ruling affects all doctors in the U.S. and can help you establish the validity of sEMG for any legal or workers compensation cases.

### Dual Inclinometry: The Proper Method of Measuring Range of Motion.

According to the *AMA Guides*, 5<sup>th</sup> Edition pages 400-405, under 15.8b : "Since spinal motion is compound, it is essential to measure simultaneously motion of both the upper

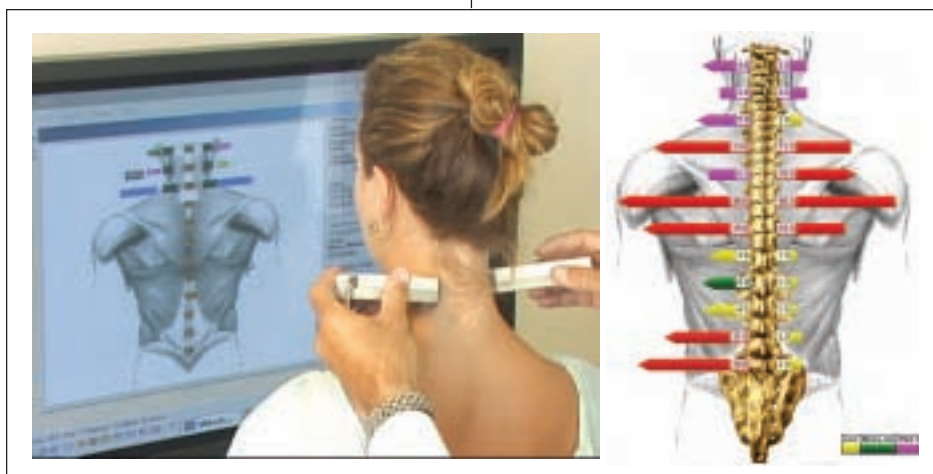


Figure 1 - Static screen 1 and graphic showing areas of contracture.