# S.E.M.G. and Chiropractic Guidelines*

W Reg Nicholson MSc, DC**

Ladies and Gentlemen, today I have been asked to speak to you on behalf of the convenors of this meeting and I will limit my remarks to present the Canadian Chiropractic Association's position in respect to surface electromyography. This very brief discussion addresses 3 major issues that involve surface electromyography in the practice of chiropractic in Canada. The issues are:

1 What is the current role of surface electromyography in chiropractic practice in Canada?
2 What are the current guidelines for S.E.M.G. use as outlined in the Canadian Chiropractic Association's guidelines for chiropractic practice?
3 What will future S.E.M.G. guidelines need to include in order to ensure surface electromyography effective utilization?

Many of you may not be familiar with electromyography. There are three specific kinds of electromyography that are currently in use in the scientific community, the first consisting of the use of surface electromyography, the second needle electromyography and the third, – wire electrode electromyography. In chiropractic practice, legislation precludes the use of the last two kinds so S.E.M.G. is used. The utilization of surface electromyography is relatively non-invasive and a safe technology with high reliability and validity.

The use of S.E.M.G. in chiropractic practice primarily focuses in the areas of:

1 A time/force relationship of surface electromyographic signals,
2 kinesologic studies of surface muscles, and
3 neurophysiological studies of surface muscles.

In using S.E.M.G. in this manner a trained chiropractor is able to integrate findings recorded from S.E.M.G. to:

1 To objectify muscle damage or impairment and utilize this to classify severity and the types of impairment in the muscle function. This is reflected through:
   (a) magnitude of myoelectric activity and
   (b) the symmetry of the myoelectric signal when compared with similar muscles on the non involved side.
2 To assess kinesologic function. That is we are looking at the bio-mechanical factors while respecting pre-existing disorders, anomalies and pathologies.
3 To allow the chiropractor to monitor the effectiveness of the therapeutic program and provide him/her with an opportunity to subsequently modify the rehabilitation program to the injured area of the patient.
4 To allow the chiropractor to objectively document the presence or absence of progress of the treatment program thereby contributing to the clinical decision making process to:
   (a) either discharge the patient from care
   (b) objectify any residual and permanent damage or
   (c) refer the patient for care to another health professional.

In regard to the current guidelines relating to the use of S.E.M.G., the Canadian Chiropractic Association, in March 1994, released a publication entitled *Clinical Guidelines for Chiropractic Practice in Canada*. Undoubtedly, many of you in the insurance industry are already familiar with these guidelines. It should also be noted at this time that the chiropractic profession is the first of the healing arts to publish such extensive guidelines for practice and procedures in this country. These are association guidelines and not standards which are derived from legislative or regulatory restrictions which vary from one political jurisdiction to another. The guidelines are meant to provide professional direction for chiropractors respecting the confines of the legislative jurisdiction in which they practice.

One of the many items that are addressed in this publication is surface electromyography. The regulations or recommendations of the guidelines are found on pages 76, 122, and 125 of the *Clinical Guidelines for Chiropractic Practice in Canada*. The frames of reference for the categorization of procedures are found on pages 24 and 25. These guidelines were developed by a consensus process involving leading scientific, authoritative and educational professionals as well as practitioners within the profession. The guidelines are evidence based, that is they are developed on research and published literature.

The Association realizes these guidelines are a living document sensitive to scientific advances and allow for an ongoing review by authoritative individuals within the profession when warranted. There are structured committees to review and modify, when necessary, the guidelines to be consistent with the scientific knowledge available within the scientific community. The Guidelines will be updated on a regular basis via future

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** Private practice. Midland Chiropractic Clinic, 578 King Street, Midland, Ontario L4R 4P3. (705) 526-6221.

consensus and guidelines meetings. There are tentative plans for a review of all the guidelines in 1997.

Currently the CCA Guidelines with respect to surface electromyography deal with what is regarded as a static surface electromyographic evaluation and a dynamic surface electromyographic evaluation.

A static S.E.M.G. measures one moment in time of the myoelectric activity of the muscles being evaluated. A dynamic S.E.M.G. measures the myoelectric activity of the concerned muscles over an extended period of time. A frequently used analogy is that a static evaluation is like a single photograph whereas a dynamic evaluation is like the whole video. The static S.E.M.G. allows you to measure the myoelectric activity for an extremely short period of time in a specified position whereas the dynamic evaluation allows you to view the myoelectric activity over an extended period of time and often in many ranges of motion. As you can see, the dynamic S.E.M.G. allows you to measure the myoelectric activity while the patient is performing specific tasks. In paired muscles, this allows you to determine whether there is symmetry in the myoelectric activity and if the magnitude also is equivalent in the paired muscles. This is an extremely simplified version of the differences between static and dynamic S.E.M.G.s.

The 1994 Clinical Guidelines are predicated primarily upon research already completed within the profession or based upon published research from other health professions up to 1993. Currently the Guidelines rate for fixed electrodes a standing of "equivocal" with an "evidence class level of 1, 2 and 3. This is supported by the scientific evidence related to the validity and reliability of using dynamic studies in surface electromyography using fixed electrodes. In contrast the rating for scanning surface electromyography which is completed with non-fixed electrodes (these electrodes are hand-held) is rated as "investigational" with an "evidence class level of 2 and 3." This rating had a lower consensus level too which imports basically that 70 to 85 percent of the consensus committee was in agreement with scanning electrodes classification whereas 85 percent and greater were in agreement with the classification of dynamic and fixed electrode utilization.

What this means to the profession is that the utilization of fixed electrodes is quite acceptable and has significant scientific validity whereas the use of scanning or hand-held electrodes is still in an area which has yet to reach a level of consensus from the scientific community as being valid and reliable. What this means to the insurance industry is that the chiropractor is functioning within the Guidelines when he utilizes dynamic surface electromyography with fixed electrodes whereas he is functioning outside the Guidelines when he utilizes electromyography done with hand-held, post style electrodes, but may be within provincial standards.

In the section on surface electromyography on page 122 of the Guidelines, the areas that were delineated as needing address in the future were that of equipment, knowledge and training.

This leads us to the position of now informing you of what the future may hold with respect to clinical guidelines for the use of surface electromyography in Canada. Presently the committee struck to provide input to the consensus group of the C.C.A. is in the process of drafting specific recommendations which will address:

1 Technical specifications of the equipment that is presently acceptable in the scientific community,
2 Demanding that people using surface electromyography have the requisite knowledge, training and experience and ultimately will be certified by an educational institution such as the Canadian Memorial Chiropractic College or Universite de Quebec a Trois Rivieres. Currently the Chiropractic College has a continuing education program addressing such issues.
3 Ensuring that anybody who is using surface electromyography has an ongoing quality assurance program in their surface electromyographic laboratory.

I would expect that in the future, there will be a modification to the clinical guidelines which will encourage and demand minimum technical specifications, quality assurance programs and certification of the provider in S.E.M.G.

Ultimately the insurance industry may realize significant cost containment by allowing objective methods to disclose claimants who may have other incentives for protracting their care. Surface electromyography may be one method of objectifying musculoskeletal disorders as to their presence or absence. (Reference: Roy and DeLuca 1995 Spine.) As a consequence of this, the exposure that the insurance industry may have in relation to exaggerated or false claims may be reduced. I feel it is reasonable that the insurance industry should be aware that with the use of surface electromyography, coupled with Visual-Numerical score, Functional Outcome studies, inclinometer readings, radiographic studies, competent histories and full physical examinations contribute in aiding the practitioner to determine the extent or presence of many soft tissue injuries.

In closing I would like to leave you with a quote from Dr. Basmajian of McMaster University.

> *"Controversy persists about the role of para-vertebral muscles both in normal kinesiology and in the management of back problems, however electromyography reveals the true state of affairs ignored by those who prefer to build their clinical hypothesis on 19th century conjecture. Modern research with both intra-muscular and surface electrodes clearly defines the levels of activity in normal and painful and/or spasming muscles and it offers more surprises than comfort to clinicians who have failed to keep informed."*

I thank you on behalf of the Canadian Chiropractic Association for providing us with the opportunity to present the current status of surface electromyography in clinical chiropractic in Canada and the opportunity to make you aware of the ongoing efforts to achieve the best possible standards in today's environment.