

■ Neuromusculoskeletal Medicine—Dawning of A New Day

This is a time of a remarkable number of firsts in this complex field of neuromusculoskeletal medicine. At 84 years of age, I am increasingly impressed that the more I know, the more I realize how little I know, and how poorly we understand what we think we know. With regard to new developments in the field of neuromusculoskeletal medicine, six major components of this field that relate directly to myofascial trigger points (MTrPs) come to mind.

1. This Current Issue of the *Journal of Manual and Manipulative Therapy*

This publication is the first English-language journal to devote an entire issue to MTrPs. It is also pioneering new avenues of communication by making a large portion of this issue available as open-access, online-only material on the Internet. In addition, the *JMMT* website includes, for the first time freely available on the Internet, reviews of several years worth of MTrP literature that provide current and objective summaries of each article with pointed and informed comments on their importance, strengths, and weaknesses. Some of the reviews included here eventually will appear in the quarterly *Journal of Musculoskeletal Pain* published by the Haworth Press. Other reviews included here have already appeared in that journal, which has regularly published such reviews of all of the world literature on MTrPs for the past 12 years. This special topic issue of the *Journal of Manual and Manipulative Therapy* and the article reviews included in this issue from peer-reviewed medical publications across the world indicate that MTrPs are becoming much more acceptable to mainstream medical publications. The number and quality of these research papers have been increasing remarkably in recent years.

2. Credible Etiology of MTrPs

The cause of MTrPs has been an enigma to medical science for well over a century. It has masqueraded in incomplete form as *fibrositis* (and dozens of synonyms) a century ago, which metamorphosed into *fibromyalgia*, which is equally a misnomer and equally enigmatic as defined. The integrated hypothesis for MTrPs presented a credible etiology in the 1999 *Trigger Point Manual*¹, which was later summarized in a peer-reviewed article published by the *Journal of Electromyography and Kinesiology* in 2004². This etiology is based on the confirmed observation that the endplate noise [which electromyographers are taught represents normal endplate miniature endplate potentials] is, in fact, the result of a grossly abnormal increase in those spontaneous potentials and is characteristic of MTrPs. This turns out to be a critically important observation. Recently two research papers, one by psychiatrists in Taiwan and the other by a physical therapist and a veterinarian in England, used endplate noise to objectively confirm that their electromyographic (EMG) probe needle was in fact in an MTrP. In one case, this established the MTrP presence when the needle was placed in a pain acupuncture point³, and in the other case it produced EMG confirmation of clinically identified MTrPs in horses⁴.

3. Diagnostic Gold Standard

This use of endplate noise and endplate spikes as reliable, objective indicators of MTrPs presents the possibility of a diagnostic gold standard for appropriate research investigations and some limited clinical applications (e.g., law suits, where EMG expertise in this application is available). This opens the possibility of conducting a research project to identify appropriate diagnostic criteria for MTrPs in various muscles using endplate noise as the gold or reference standard test. Such a project is currently being developed by a Spanish physical therapist. Clinicians could then use the conclusions produced by this gold-standard research to make uniformly consistent, reliable, and credible clinical diagnoses of the many MTrP-related problems.

4. Frequency-Specific Microcurrent

When I read early papers on the unprecedented effectiveness on MTrPs^{5,6} of a frequency-specific modality

that I had never heard of before—and having had disappointing previous experiences with a distant cousin that made similar claims—I was curious as to how credible it really was, but I was not expecting much. A serendipitous explanation of how and why it works by chiropractic physician Dr. Carol McMakin, who has nursed this modality into clinical usefulness, opened my eyes. The concept of using almost infinitesimal currents at specific frequencies to energize specific tissues made sense to me. After all, the difference between ice, water, and steam is only the energy levels of the water molecules. It does not take much energy to change the energy level of individual molecules. Modern medicine knows almost nothing about the effect of differing energy levels on the physiological functioning of our various body tissues, but that does not keep this unprecedented modality from working in clinical practice. This modality applies pairs of specific frequencies (to within a few Hertz) for treating specific tissues. Thus, it takes a great many frequency pairs to effectively treat the various body tissues. This is part of the cutting edge of a whole new concept of medical treatment being pioneered by bioelectromagnetic medicine⁷, which has for many years been flitting in the shadows of, but never taken seriously by, mainstream medicine. Since frequency-specific microcurrent intervention addresses tissue dysfunctions rather than anatomical deficits, it has been shown to be clinically effective in dealing with some refractory neurological dysfunctions including fibromyalgia that is initiated by a whiplash injury⁸.

5. Articular Dysfunctions

The close interactions between muscle dysfunctions and articular dysfunctions has been noted clinically but not well investigated. A pioneer osteopathic physician, Dr. Fred Mitchell⁹ and colleagues, introduced an effective muscle-energy treatment technique, but they were so focused on the articular aspect and apparently unaware of the MTrP source of the muscle problem that they missed that critical connection. However, a current osteopathic pioneer, Dr. Michael Kuchera, DO, director of research at the Philadelphia Osteopathic College of Medicine, is doing a remarkable job of integrating and teaching these concepts. Clinicians treating neuromusculoskeletal conditions are most successful when they clearly understand neurological dysfunctions and when they are skilled both at joint mobilization and at recognizing and treating MTrPs.

6. Motor Component

The MTrP literature to date deals almost exclusively with the effects of MTrPs on the sensory nervous system. Almost nothing has been published in the peer-reviewed literature concerning MTrP effects on motor functions. Barbara Headley, a pioneering physical therapist, who herself has been the victim of serious physical problems, has for at least 20 years doggedly investigated the clinical motor effects of MTrPs, using at first EMG feedback instrumentation and then surface EMG instrumentation. A few of her book chapters^{10,11} have appeared in the literature, but as of yet no peer-reviewed, well-described scientific studies have been published. However, I have been privileged to learn of the meticulously collected treasure chest of information she has accumulated over those years. The message it tells is an eye-opener.

MTrPs are as potent at modifying central nervous system motor effects as they are at influencing sensory perception. They commonly cause inhibition of the same and related muscles, which is observed clinically as muscle weakness. This is particularly evident in muscle activation when performing a task, sometimes more than on muscle testing. This lack of knowledge of the motor effects of MTrPs is a modern therapeutic tragedy because current practice is to strengthen the weak muscle with exercise while ignoring the treatable cause of the weakness. Consequently, this usual mode of treatment simply trains the use of substitute muscles, which reinforces abnormal function and is ineffective at relieving that muscle's weakness. Surface EMG recordings show this clearly.

In addition, MTrPs can cause referred spasm in functionally related muscles and loss of muscle coordination that can be serious, especially where it is in critical locations like the shoulder joint. Fortunately, there is a program developing in the Physical Therapy Department of Georgia State University to investigate these effects with the latest surface EMG equipment and to report them appropriately in the peer-reviewed literature.

There are now two large volumes discussing the sensory effects of MTrPs that have been translated into 11 foreign languages^{1,12}. It now looks to me as if an analogous adequate presentation of the motor effects of MTrPs will require an equal amount of information when that aspect of MTrPs has been investigated as fully as the sensory aspect has been. However, in many ways, that is a quite different story. Stay tuned!

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■ The Journal of Manual and Manipulative Therapy is indexed in the Cumulative Index to Nursing and Allied Health Literature (CINAHL), MANTIS, EBSCO databases, and in EMBASE, the Excerpta Medica database.