

# **New Frontiers in Chronic Myofascial Pain and Central Sensitization:** Integrating Advancements in the Pain Sciences with Evaluation and Treatment Strategies

Jay P. Shah MD and John Srbely DC, PhD

## **Description**

This workshop will explore the dynamic and pivotal roles that myofascial trigger points (MTrPs), central sensitization, limbic system dysfunction, and objective physical findings play in the evaluation and management of chronic myofascial pain. Fascinating knowledge emerging from the pain sciences will be presented in a clinically accessible way.

Spinal Segmental Sensitization (SSS) is a hyperactive state of the dorsal horn caused by nociceptive bombardment. Painful MTrPs are associated with chronic myofascial pain and are a common source of persistent nociception and sensitization, resulting in SSS and facilitated segments. Furthermore, maladaptive changes in subcortical structures and dysfunctional descending inhibition may contribute to somatic tissue abnormalities (e.g., tissue texture changes, tenderness, etc.) in addition to adversely impacting mood, affect, and sleep.

Typical manifestations of SSS include physical findings of dysesthesias including dermatomal allodynia/hyperalgesia, sclerotomal tenderness, expansion of receptive of fields and painful MTrPs within the affected myotomes. Affected patients usually exhibit increased wind-up within the affected dermatome. This can be quantified clinically through Quantitative Sensory Testing (QST) techniques such as weighted pinprick analyses measuring mechanical pain threshold (MPT) and wind-up ratios (WUR). These represent measures of central facilitation that can be used in the diagnosis and management of chronic myofascial pain.

Participants will learn to recognize and examine these objective and reproducible physical findings in order to identify the dysfunctional spinal segment(s) that should be targeted for treatment. The application of Quantitative Sensory Testing techniques in the assessment of central sensitization will be presented. Participants will also learn needling techniques that deactivate painful MTrPs and the sensitized spinal segments associated with them in order to effectively alleviate chronic myofascial pain. The clinical application and interpretation of MPT and WUR outcomes will be discussed and demonstrated as an objective measure of improvement in pain sensitivity post-intervention. The diagnostic and treatment techniques presented are applicable in the management of a variety of chronic musculoskeletal pain conditions.

## Learning Objectives

Upon completion of this workshop, participants will have learned:

- 1) The unique neurobiology of muscle pain and the dynamic interplay of muscle nociceptors and endogenous biochemicals in the initiation, amplification, and perpetuation of peripheral and central sensitization
- 2) How to palpate and distinguish active (i.e., spontaneously painful) MTrPs from latent MTrPs and to identify the referred pain patterns commonly encountered in clinical practice
- 3) How to determine the reproducible physical manifestations of spinal segmental sensitization (involving dermatomes, myotomes, and sclerotomes) observed in chronic myofascial pain and dysfunction
- 4) How to employ Quantitative Sensory Testing in the assessment of central sensitization. Specific techniques include measurement of mechanical pain thresholds (MPT) and windup ratios (WUR) using weighted pinprick technique.
- 5) Dry needling techniques that desensitize the involved segments, deactivate painful MTrPs, and alleviate chronic myofascial pain and dysfunction
- 6) How to apply and interpret MPT and WUR outcomes as an objective measure of improvement in pain sensitivity post-treatment.

## Brief Speaker Bio

**Jay P. Shah, MD** is a physiatrist and clinical investigator in the Rehabilitation Medicine Department at the National Institutes of Health in Bethesda, Maryland-USA. His expertise is in the evaluation and mechanisms of chronic and myofascial pain and treatment techniques such as dry needling and acupuncture. His presentations integrate the fascinating knowledge emerging from the basic and clinical pain sciences.

Dr. Shah and his co-investigators have utilized novel microanalytical and ultrasound imaging techniques that have uncovered the unique biochemical milieu (e.g., inflammatory mediators, neuropeptides, etc.) and viscoelastic properties of active myofascial trigger points (MTrPs). Their studies have revealed objective, reproducible, and quantifiable muscle tissue properties associated with MTrPs and quantitative effects of dry needling on these tissue properties.

Dr. Shah was selected by the American Academy of Pain Management as the 2010 recipient of the Janet Travell Clinical Pain Management Award for excellence in clinical care and by the

National Association of Myofascial Trigger Point Therapists as the 2012 recipient of the David G. Simons Award for excellence in clinical research.

**Dr John Z Srbely DC PhD**, is a full-time Assistant Professor in the Department of Human Health and Nutritional Science, University of Guelph (Guelph, Ontario, Canada). He previously held a Canadian Chiropractic Research Foundation (CCRF) Research Chair in Spine Mechanics and Neurophysiology (2008-2013).

His primary research interest centers around the study of the physiologic mechanisms and role of central sensitization and neurogenic inflammation in the pathophysiology of myofascial trigger points and the clinical manifestation of chronic myofascial pain. He has received a prestigious Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant to study the causal relationship between central sensitization and the physiologic expression of sensitivity, morphology and electrophysiology of the myofascial trigger point within human peripheral muscle. His research program also aims to advance both experimental and clinical techniques for the quantification of central sensitization in humans.