

INTRODUCTION TO THE CLINICAL APPLICATION OF REHABILITATIVE ULTRASOUND IMAGING: LUMBO-PELVIC DYSFUNCTION

Continued research highlights that the primary impairment of the muscular system in individuals with lumbo-pelvic dysfunction is not one of strength, endurance or functional capacity, but rather of motor impairment. In particular there is a pattern of hyperactivity of the superficial, and hypoactivity of the deep muscles of the region. The clinical extrapolation of this is that the initial and pivotal focus in rehabilitation must address these motor impairments by retraining a coordinated co-contraction of the deep trunk muscles, and restoring appropriate activation of the superficial muscles. Success hinges upon the ability to detect the specific motor deficits of each individual patient. This requires a high level of clinical skill as these some of these muscles are located deep and their desired contraction is sub-maximal. Consequently, the evaluation and the initial retraining phase can be augmented with the aid of **ULTRASOUND IMAGING** technology.

REHABILITATIVE ULTRASOUND IMAGING (RUSI) has been used by research driven clinicians as a safe and cost effective method to enhance both the assessment and treatment of patients with motor impairments of the lumbo-pelvic muscles, (including; external and internal oblique, rectus abdominis, transversus abdominis, lumbar multifidus, the diaphragm and the pelvic floor muscles). The value of RUSI is that it allows for real time study of these muscles as they contract and impact their associated fascial attachments. This allows both the patient and the therapist to view the contraction as it happens, leaving little room for supposition. Consequently RUSI can be used as both an assessment tool, and maybe more importantly as a form of biofeedback, providing patients with knowledge of performance, in the early stages of motor relearning.

This course is for therapists with access to RUSI or who want to acquire or perfect their imaging and interpretation skills with regards to the lumbo-pelvic region scanning applications.

OBJECTIVES

- Introduction to RUSI, including an overview of the history, scope of practice of the use of ultrasound imaging by Physical Therapists.
- Demonstrate basic USI and instrumentation principles including the various modes and applications of the technology.
- Demonstrate of the types of information that are available with USI (namely muscle architecture and echogenicity) and how these are related to muscle composition and activity.
- Demonstrate how to generate images of the lateral abdominal wall muscles, rectus abdominis, linea alba, lumbar multifidus, lumbar longissimus and bladder base.
- Demonstrate an understanding of how to interpret static and dynamic imaging studies of abdominal wall, pelvic floor and lumbar paravertebral muscle function.
- Demonstrate an understanding of how to perform measurements of muscle girth, length, cross-sectional area as well as fascial length and bladder base motion.
- Describe and demonstrate use of USI in the treatment of lumbopelvic dysfunction including facilitation strategies for activation of TA, PFM and dMF.

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Jackie received her undergraduate degree with distinction from the University of Alberta in 1993. In 1997 she completed the requirements to become a Resident of the Canadian Academy of Manipulative Therapists, and in 1998 her Fellow designation with credit. She is a registered instructor with the Orthopaedic Division of the Canadian Physiotherapy Association. In 1998 she was certified in the application of Intramuscular Stimulation (a dry needling technique) by the Institute for the Study and Treatment of Pain (ISTOP), and in 1999 awarded a Certificate from the Acupuncture Foundation of Canada Institute (AFCI). She is currently an independent clinical consultant in White Rock B.C. Canada.

Jackie has extensive clinical experience with the incorporation of rehabilitative ultrasound imaging (RUSI) in the assessment and treatment of individuals with spinal dysfunction. In addition she has identified an improvement in the instructional, palpatory, and observational skills of therapists that have had exposure to the technology for confirmation. Jackie has developed and taught specialized courses on the clinical application of ultrasound imaging in the management of low back and pelvic girdle pain for physiotherapists in Canada, the USA, Norway, the Middle East, South America and the

UK. In addition to her clinical and instructional pursuits she is a research consultant and associate investigator for the U.S. Army-Baylor University Doctoral Program in Physical Therapy, is an associate editor for the Journal of Manual and Manipulative Therapy and a member of the editorial review board for the Journal of Orthopaedic & Sports Physical Therapy. Jackie has contributed to over 17 peer reviewed journal articles and to a text on the topic of RUSI, and is the author of a textbook entitled "Ultrasound Imaging for Rehabilitation of the Lumbopelvic Region: A clinical approach".