MassageToday®

Advanced Stretching: Using Neural Inhibition to Enhance the Stretch, Part 1

By Joseph E. Muscolino, DC

There is an art and a science to practicing manual and movement therapies. The science yields a set of guidelines that provide the structure for our therapy. We develop this science as an extension of our understanding of the anatomy, physiology, and kinesiology of the body. The art of our practice involves how we apply and combine these guidelines for the optimal treatment of the client who is on our table. As an artist, the medium of the client's body that we primarily work upon is the myofascial system of muscles, tendons, ligaments, and other dense and loose fascial structures. We could look upon this myofascial system as the canvas upon which we work.

One of the major objectives of a massage therapist is to loosen these soft myofascial tissues when they become taut. Taut tissues may be overly contracted muscles. They may also be musculature or other soft tissues that have accumulated fascial adhesions. The problem with taut soft tissues is that they decrease flexibility of the body. Whenever a joint moves in one direction, soft tissues on the "other side of the joint" need to lengthen to allow this motion to occur. Taut soft tissues do not lengthen, therefore they limit motion of the body.

Massage therapy treats these taut tissues by the use of soft tissue manipulation. This manipulation is often direct as in the case of actual massage strokes such as gliding, kneading and compression. The use of hot and cold therapy can also be used. Another extremely effective treatment option, and one that is within the scope of practice of massage therapists, is stretching. When combined with heat and massage therapy, stretching can make a critical difference in the progress of our clients.

Stretching

Stretching is essentially a mechanical process wherein we place a tension (pulling) force into the client's body, causing a lengthening of the target soft tissues. Although standard stretching performed in this manner often works quite well, there are advanced stretching options that are usually more effective. (With all forms of stretching, it is critically important that the force of the stretch is never excessive, or a muscle spindle reflex may be triggered that results in spasming of the muscle, defeating the purpose of the stretch.)

Advanced Stretching Techniques

The most commonly practiced type of advanced stretching technique is one in which a neurologic reflex is used to inhibit, in other words, relax the target muscle that is being stretched. Creating neural inhibition then allows greater stretch of the musculature when the mechanical tensile force of the stretch is applied. There are two types of advanced neural inhibition stretching techniques: contract relax (CR) and agonist contract (AC). (We will discuss AC stretching in-depth in part two of this series.)

Contract Relax (CR) Stretching

CR stretching is also known as postisometric relaxation (PIR) stretching. AC stretching is the basis for Aaron Mattes' Active Isolated Stretching (AIS) technique. Both CR and AC stretching are often described as proprioceptive neuromuscular facilitation (PNF) because they utilize a proprioceptive neuromuscular reflex to facilitate the stretch.

The basis of CR stretching is the Golgi tendon organ (GTO) reflex. GTOs are proprioceptive receptors that are located in the tendons of a muscle and are sensitive to stretch. If a muscle belly contracts forcefully, it pulls on and stretches its tendon; this stretching force is detected by the GTO. If the muscle belly contracts too forcefully, the tendon might be torn; therefore the role of the GTO is to protect the tendon by monitoring the stretch forces that are placed on it. The GTO prevents tearing of the tendon by sending a signal into the spinal cord that triggers the GTO reflex, which then inhibits the muscle from contracting; in other words, relaxing it. We can make use of the GTO reflex to more effectively stretch a muscle.

CR stretching is performed by asking the client to contract the target muscle to trigger the GTO reflex. We then ask the client to relax and we stretch the target muscle, taking advantage of the increased relaxation (inhibition of the muscle) caused by the GTO reflex. The usual CR stretching protocol steps are carried out as follows. The right lateral flexor (RLF) group of the neck is used as our target musculature in this example (**Fig. 1**):

OVER ▸

a. Have the client begin in a neutral starting position.

b. "Pre-stretch" the client into left lateral flexion (LLF) until the beginning of tension is felt.

c. Ask the client to gently isometrically contract the RLF target musculature against your resistance for approximately 5-8 seconds to trigger the GTO reflex. The client can either exhale or hold in the breath during this step. When providing resistance, it is important to not push against the client, but rather to simply meet and resist whatever contraction force the client is creating.

d. Have the client relax, wait a split second, and then further stretch the client into LLF. This completes one repetition. Typically 3 to 4 repetitions are done, each one beginning at the end (stretched) position of the previous repetition; and the client is asked to increase the force of contraction with each repetition. Although CR stretching usually involves isometric contraction, the client could be allowed to concentrically contract the muscle instead. Also, even though each repetition most often begins where the previous repetition ended, it is possible to ease off the stretch and begin the next repetition from a less-stretched position. What is important with CR stretching is that the target muscle contracts with sufficient strength so that the GTO reflex is triggered.

Fig. 1: Contract Relax (CR) stretch of the right lateral flexor (RLF) functional group of muscles of the neck. The therapist pre-stretches the client's neck into left lateral flexion until tension is felt. A) The client isometrically contracts the RLF musculature against the therapist's resistance. B) The client relaxes and the therapist further stretches the client.

All photos are reproduced from The Muscle and Bone Palpation Manual, with Trigger Points, Referral Zones, and Stretching. J. Muscolino. Mosby of Elsevier Science, 2009 Photography by Yanik Chauvin

Clinically, the choice to use standard mechanical stretching or to employ an advanced technique such as CR stretching should be made based on the needs of the client on the table. Any stretch can be converted into a CR stretch.

As a clinical therapist, it is important to have as many treatment tools in our tool chest as possible. CR stretching does require participation on the part of the client; and generally there is a learning curve for both the therapist and client to become efficient and smooth when performing it. However, once the protocol becomes familiar, it is quite easy to employ and incorporate into the treatment session. CR stretching is especially valuable when working on clients who have not responded well to massage and standard stretching. If you have not yet worked with CR stretching, try adding this tool to your practice.

Part two of this article explores the other advanced neural inhibition stretch, agonist contract (AC) stretching. It also compares CR with AC stretching, and discusses the contract relax agonist contract (CRAC) stretching technique.

Joseph E. Muscolino, DC, has been a massage therapy educator for 24 years, teaching both core curriculum and continuing education classes. He currently teaches Anatomy and Physiology at Purchase College, SUNY. He is the owner of The Art and Science of Kinesiology in Stamford, Connecticut, and is the author of The Muscle and Bone Palpation Manual, with Trigger Points, Referral Zones, and Stretching; The Muscular System Manual, 3rd edition; and Kinesiology, The Skeletal System and Muscle Function, 2nd edition (Elsevier, 2009, 2010), as well as other publications. For more information or to contact Joseph, visit his Web site at **www.learnmuscles.com.**

Massage Today is an MPA Media Publication