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ADVANCED STRETCHING: USING NEURAL INHIBITION TO ENHANCE THE STRETCH, PART 2

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In part 1 of this series, we discussed contract relax (CR) stretching, which involves neural inhibition to augment the mechanical stretch of the target musculature. Here, in Part 2 of this series, we will discuss agonist contract (AC) stretching, which also uses neural inhibition to augment the mechanical stretch of the target musculature.

AC Stretching

Similar to CR stretching, AC stretching also relies upon a neurologic reflex. However, whereas the Golgi tendon organ (GTO) reflex is the proposed neural mechanism for CR stretching, reciprocal inhibition is the proposed neural mechanism for AC stretching. The mechanism of RI is that whenever a mover muscle contracts and shortens to create a joint action, the antagonist musculature (that

is usually located on the other side of the joint) must lengthen to allow that motion to occur. RI reflex acts to facilitate the lengthening of the antagonists by inhibiting them from contracting. This inhibition causes a relaxation so that the antagonists more effectively lengthen. As with the GTO reflex, we can take advantage of this reflex to create a better stretch.

AC stretching is performed by creating a scenario in which the target muscle that will be reciprocally inhibited is the antagonist to the joint motion that is performed. The usual AC stretching protocol steps are carried out as follows. The right lateral flexor (RLF) musculature of the neck are used as the example (FIG. 1):

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

- Ask the client to actively concentrically contract the left lateral flexion (LLF) musculature, moving the neck into LLF. By doing this, the target RLF musculature is the antagonist of the motion. Their stretch is begun and the RI reflex is triggered. The client usually exhales during the contraction (think e for exhale and e for exertion).
- The client then relaxes and we further stretch the client into LLF. The client usually completes the exhale during this step.
- The client continues to relax as we passively bring the client back to the starting position. The client inhales during this step so she is ready for the next repetition.

Typically eight to 10 repetitions

are performed, and we progressively increase the force of the stretch with each repetition. Because a large number of repetitions are performed with AC stretching, each repetition is usually performed fairly quickly. An entire repetition takes approximately 3–5 seconds.

Comparing CR and AC Stretching

To more easily learn these techniques, it can be helpful to compare CR with AC stretching. With CR stretching, the target muscle group isometrically contracts against our resistance. (Note: Part 1 of this series, the target right lateral flexors isometrically contract.) With AC stretching, the target muscle group is turned into the antagonist of the joint motion. Note that in Figure 1a of Part 2 here, the

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FIGURE 1: AC stretch of the right lateral flexor functional group of muscles of the neck. A, the client actively moves into left lateral flexion (LLF); B, the client relaxes and the therapist further stretches the client's neck into LLF.

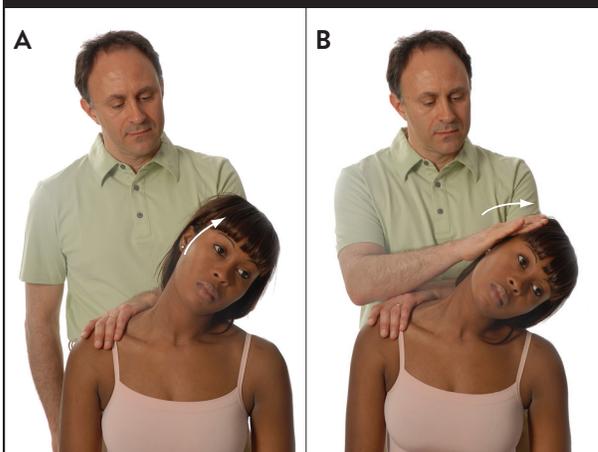
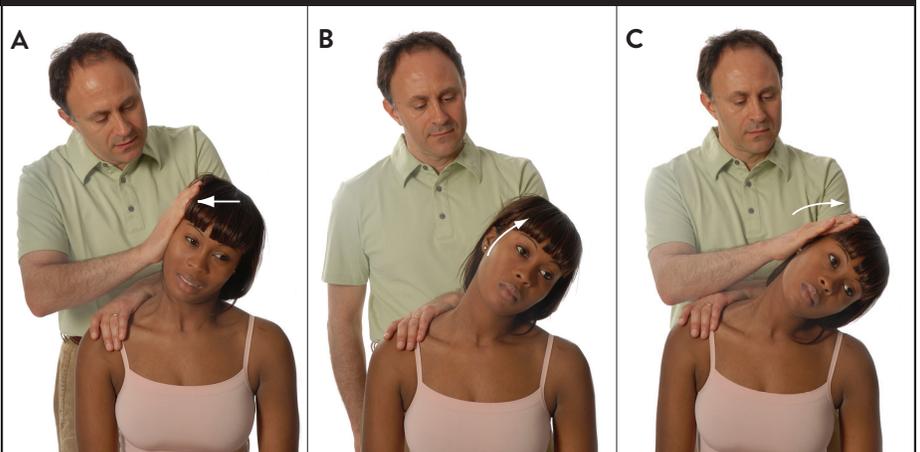


FIGURE 2: CRAC stretch of the right lateral flexor (RLF) functional group of muscles of the neck. A, starting from a neutral position, the client isometrically contracts the RLF musculature against resistance; B, the client actively moves into left lateral flexion (LLF). C, the client relaxes and the therapist further stretches the client's neck into LLF.



left lateral flexors concentrically contract (again the right lateral flexors are the target musculature). It can help to remember that with AC stretching, the client's contraction actually begins the stretch of the target musculature.

Contract Relax Agonist Contract Stretching:

CR and AC stretching can be combined to create contract relax agonist contract (CRAC) stretching. As its name implies, a CRAC stretching repetition is done by sequentially performing the CR and then the AC stretching techniques. The benefit of CRAC stretching is that it triggers both the GTO and the RI reflexes, therefore potentially creating a more powerful inhibition/relaxation of the target musculature. The usual CRAC stretching protocol steps are carried out as follows. The RLF musculature of the neck are again used

as the example (**FIG. 2**):

- a. Have the client begin in a neutral starting position.
- b. Ask the client to gently isometrically contract the target RLF musculature against our resistance for approximately 5-8 seconds to trigger the GTO reflex. The client holds in the breath during this step. This is the CR portion of the stretch.
- c. Then ask the client to concentrically contract the LLF musculature to move into LLF. This begins the stretch the RLF musculature and it triggers the RI reflex. The client exhales during the contraction. This is the AC portion of the stretch.
- d. The client then relaxes and we further stretch the client into LLF.
- e. We then passively bring the client back to the starting position as the client inhales. This

completes one repetition.

Three to five repetitions are usually performed, each one beginning from the same neutral starting position, as is done with AC stretching. Typically, the client is asked to increase the force of contraction with each repetition, and we progressively increase the force of the stretch with each repetition.

Most every stretch can be performed as a CR or an AC stretch, or even a CRAC stretch. Both CR and AC advanced stretching techniques are equally effective. Which one you choose to use will most likely depend upon client preference and which technique is logistically easier for that particular muscle and the position that the client is in. Advanced stretching techniques might take a little more time, effort, and practice to master, but the benefits to your clients are well worth it. 

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, Conn., 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, 2010), as well as other publications. For more information or to contact Joseph, visit www.learn-muscles.com.

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