

Reducing the Autogenic Inhibition Reflex:
Making Weak Muscles Strong
Dr. Todd Turnbull, DC

The Autogenic Inhibition (AI) reflex is a sudden relaxation of a muscle in response to excess tension.[1] This automatic lengthening reflex is controlled by the central nervous system and is regulated by the proprioceptors in the muscles and tendons, mostly by the golgi tendon organs (GTO). The golgi tendon organ is a stretch receptor that signals the amount of force developed by a muscle.

The AI reflex may be extensively involved in motor control under both normal and abnormal conditions. “One possibility is that this reflex helps to spread the amount of work evenly across the entire muscle, so that all motor units are working efficiently. That is, if some muscle fibers are bearing more of the load than others, their Golgi tendon organs will be more active, which will tend to inhibit the contraction of those fibers. As a result, other muscle fibers that are less active will have to contract more to pick up the slack, thereby sharing the work load more efficiently.” [2]

In a dysfunctional muscle a certain number of muscle fibers will not be able to perform the normal amount of work output. If the load is shifted from healthy fibers to dysfunctional fibers then the whole muscle may lose power.

This reflex can be altered by stimulation of the GTO in both a negative and a positive manner. Positive stimulation results in a decrease in the reflex leading to greater muscle power output; whereas a negative stimulation would lead to an increase in the reflex being active and a reduction of muscle loading capacity.

Muscle power output can be evaluated using both muscle testing dynamometers and manual muscle testing. Changes in the AI reflex, as a result of direct stimulation, can be observed by performing muscle strength testing.

Eccentric break testing protocols are the preferred method of manually testing muscle power output, where the goal of testing is to break the patient’s resistance. [3] A normal healthy muscle has the ability to isometrically lock against a reasonably applied force; while a dysfunctional muscle will break down against the same force or less. Grading the muscle ‘break’ can be determined based on the amount of force applied from slight (one finger pressure), moderate and strong resistance.

Positive stimulation of the GTO is accomplished by pressing the tendon into the bony insertion and holding for 3 to 5 seconds with a force that is comfortably tolerable to the patient, while negative stimulation involves pulling the tendon away from the insertion. Comparing pre- and post-adjustment testing will note whether the stimulation was positive, neutral or negative.

The goal of treatment of a dysfunctional muscle is to restore normal muscle power output. Positive stimulation of the GTO should always result in a reduction of the AI reflex and a noticeable increase in muscle resistance during eccentric

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break testing, usually leading to the muscle being able to perform an isometric lock.

What the patient experiences is a dramatic change in muscle function with a treatment time of only seconds. Patients are surprised that changes can happen so quickly and refer to the changes as being like 'magic'.

This is one of the principles that Myotonic Facilitation Technique incorporates to achieve successful patient outcomes.

- 1) autogenic inhibition. (n.d.) Segen's Medical Dictionary. (2011). Retrieved March 4 2015 from <http://medical-dictionary.thefreedictionary.com/autogenic+inhibition>
- 2) <http://neuroscience.uth.tmc.edu/s3/chapter02.html>. Retrieved March 4 2015
- 3) Gary L Smidt and Mark W Rogers . Factors Contributing to the Regulation and Clinical Assessment of Muscular Strength. PHYS THER. 1982; 62:1283-1290. PMID: 7111401