

Flexibility Considerations: PNF Stretching

By Joe Giandonato, MS



Coaches, trainers, and athletes alike have abandoned traditional static stretches and potentially harmful ballistic stretches in exchange of PNF stretching. I know what you novices are thinking. Another freaking acronym to remember, right? Proprioceptive Neuromuscular Facilitation has been found to be useful in both clinical and athletic settings and highly effective in treating patients and improving athletic performance. Let's delve into the mechanisms of PNF stretching, the rationale supporting its prescription and use, and the potential implications and contraindications behind it.

So what is Proprioceptive Neuromuscular Facilitation?

Admittedly, as a novice trainer boasting only an in-house weekend certification many years ago, I had no idea what the more experienced trainers at my gym were talking about when they mentioned the string of uber-syllabic words. Hell, I couldn't even pronounce it at first and in conversation with them, I, with garbled speech would utter "partner assisted muscular neurology stretching". Though my pronunciation of it was comparable to a first-generation Irish-American attempting to pronounce my last name, I kind of understood what was going on during PNF stretching. But heck, what did I care about it. Having my clients perform prolonged static stretches and endless series of rapid bouncing and bobbing, seemingly in pain, was earning me more money than my fellow friends and classmates could day dream about while they bused tables and operated cash registers on the weekends. Plus, I got to wear a two sizes too tight, mesh polo-shirt with the word 'trainer' screen printed on the back, that showed off my massive 15" inch arms and my ever jutting-out collar bones. So cool!

Initially, PNF stretching was adopted by clinicians who sought to improve strength and muscle activation in their injured patients. The techniques they employed during the "Baby Boom" boon have since been modified and adapted for their use in athletic settings. In most cases, PNF stretching is performed with the assistance of a partner, who will usually help administer the three common types of PNF stretching: Hold-Relax, Contract-Relax, and Hold-Relax with Antagonist Contraction. So I guess I was onto something as a fresh-faced, newly minted personal trainer about PNF stretching involving a partner's assistance. The Hold-Relax technique, which often precedes the latter two stretches, utilizes autogenic inhibition (1). Autogenic inhibition occurs when the same muscle simultaneously relaxes while experiencing increased tension (2).

In this technique, the muscle intended to be stretched is placed in an elongated position and subjected to partner resistance for 10 seconds. During the partner's resistance, the muscle is isometrically contracting. Following the isometric contraction, a new position is assumed, thus achieving a new, yet temporary maximum resting length. This newly assumed position is held up to 30 seconds and repeated up to 3 times (1).

The Contract-Relax technique, also dubbed as the Agonist-Contract technique, again is initiated by placing the muscle that is intended to be stretched in an elongated position (1). However, this time it is the antagonist muscle that is being stretched, while the opposing muscle contracts, thus utilizing reciprocal inhibition.

Lastly, the Hold-Relax with Agonist Contraction, utilizes both autogenic and reciprocal inhibition (1), as the muscle is both stretched, isometrically contracted, relaxed, while a similar process is repeated with the antagonist muscle to pull the original muscle into a new maximum resting length.



So why should we consider PNF stretching?

Let's not make a gross generalization out of PNF stretching being far superior to other forms of stretching. That's not my intention here. However, literature and recent studies support its implementation to improve both performance and basic physical functioning.

A study involving aged residents at an assisted-living facility who underwent a PNF stretching program, noted statistically significant ($p < .05$) improvements in shoulder and ankle flexion ROM as well as improved strength of hip extension, ankle flexion, and ankle extension (3). Extensor muscles, which are often the first muscle group to deteriorate as the body ages, were actually strengthened via PNF stretching in this study. Hold-Relax and Contract-Relax techniques were found to be useful in improving the shoulder ROM of overhand athletes aged 25-50. The study, which included participants from tennis, baseball, and football, showed improvements up to (+14.60 degrees) in shoulder ROM (4). Increased ankle ROM at (+7.8%), maximal isometric strength (+26%), and rate of force development (+25%), were realized following PNF stretching of the ankle joint three times per week for four weeks (5). Another study, conducted by Belgian researchers, noted improved dorsiflexion ROM in group who

performed a 6-week PNF stretching of the calf muscles (6). Healthy college aged men experienced improved hamstring flexibility following just five days of PNF stretching (7). PNF stretching in conjunction with other treatment modalities has also been proven effective in achieving reduced sensory deficits (8).

As with static stretching, the benefits of PNF stretching may only be fully realized once optimal soft tissue or muscle quality is achieved. As stated in the first *Flexibility Considerations* article, flexibility largely depends on tissue quality – if you're riddled by adhesions and tightness, direct flexibility work won't be as effective. If you're slumped in a kyphotic posture eight hours a day, then advanced stretching protocols aren't going to be the most effective means to get your body re-aligned. Stretching, in conjunction with soft-tissue work, resistance training, and proper ergonomics will, undoubtedly improve flexibility, strength, recovery, and perhaps your performance at work. Err, maybe not the last one, unless your company's web administrator decides to block every social networking site and of course, joshstrength.com

Until next time...

References

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