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IFSPT International Perspective

Alternative Flexibility Training

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Over the last approximately 20 years, research has reported on performance impairments following prolonged durations of static stretching. This has led to a paradigm shift towards dynamic stretching. There has also been a greater emphasis using foam rollers, vibration devices, and other techniques. Recent commentaries and meta-analyses suggest that stretching need not be listed as a fitness component as other activities such as resistance training can provide similar range of motion benefits. The commentary aims to review and compare the effects of static stretching and alternative exercises for improving range of motion.

INTRODUCTION

Static stretching was a mainstay for decades for warm-ups before activities, training to increase range of motion (ROM), and rehabilitation from injuries.[1] The popularity of static stretching came into question starting in the late 1990s with research reporting acute static stretching-induced performance (i.e., strength, power, balance, sprint speed) decrements.[1,2] Recent research has elucidated the weakness of these prior studies, including a lack of ecological validity in terms of static stretching durations, testing times, lack of inclusion of dynamic activities within a warm-up, and nocebo effects among others.[1,2] Static stretching produces trivial effects on subsequent performance when less than 60 seconds of stretching per muscle group is incorporated into warm-ups that included dynamic activities.[1,2]

Static stretching has recently taken another hit, with commentaries[3,4] suggesting that stretching need not be incorporated as a fitness component like training for muscle strength and endurance, cardiorespiratory endurance, or body composition since activities such as resistance training, foam rolling, and local vibration can similarly increase flexibility. Though static stretching has fallen out of favour as a warmup activity, it still has merit as a means to increase ROM.

While the popularity of static stretching has diminished, the implementation of dynamic stretching during warm-ups has increased.[1,2] Our recent meta-analysis[5] reported no significant differences between static stretching, dynamic stretching, and proprioceptive neuromuscular facilitation (PNF) for increasing ROM. There were also no significant differences between stretching at higher or lower intensities. Therefore, though dynamic stretching may be an important warm-up component, it does not offer improvements over static stretching for increasing ROM.

Furthermore, the advent of new techniques to increase ROM does not necessarily mean that these alternative methods are better. Therefore, this perspective aims to expound on these alternatives.

RESISTANCE TRAINING EFFECTS ON RANGE OF MOTION

Although it has been known for centuries that resistance training can improve muscle strength, power, and endurance, our recent meta-analysis documented that resistance training (free weights, machines, Pilates, but not calisthenics) can provide similar ROM increases as static stretching.[6] Subgroup analyses found that “untrained and sedentary” individuals had significantly higher, large magnitude ROM improvements than the small increases with “trained or active people”. Since resistance training can

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provide moderate magnitude improvements in ROM, stretching before or after resistance training may not be necessary.

FOAM ROLLING EFFECTS ON RANGE OF MOTION

Foam rolling is a popular modality that acutely and chronically increases ROM[7] without performance deficits.[8] Our recent meta-analysis[7] concluded that foam rolling had a moderate magnitude effect on ROM with >4 weeks of foam rolling training. There were differences between muscles as foam rolling increased joint ROM when used on the hamstrings and quadriceps, but not ankle dorsiflexion when foam rolling was employed on the triceps surae. We suggested that certain joints with more limited ROM such as the ankle or with a prior history of injuries (e.g., sprains) may not be as receptive to foam rolling. Another meta-analysis[9] from our lab revealed no significant ROM differences between single bouts of stretching and foam rolling suggesting they are equally effective. As such, the underlying mechanisms of increased stretch tolerance or soft-tissue compliance would likely be similar for static stretching and foam rolling.

VIBRATION

Local muscle vibration alone and combined with static stretching have been used to increase ROM.[1] The research findings are diverse with vibration (35 Hz with 2 mm amplitude) and static stretching augmenting hamstrings flexibility more than static stretching alone, while in other studies, local vibration (i.e., 30 Hz at 4 mm displacement, 44 Hz with 0.1 mm displacement) alone induced similar ROM improvements as static stretching and was more effective than dynamic stretching.[1] The reported mechanisms underlying vibration-induced increases in ROM are increased stretch threshold, augmented blood flow, diminishing muscle viscosity, and decreases in the phasic and static stretch reflexes.[1]

DON'T COUNT OUT STATIC STRETCHING (YET)!

For individuals with injuries that do not permit resistance training, another static stretching benefit is increased muscle strength and hypertrophy with daily static stretching of 10-60 minutes.[10] Prior reviews have reported that static stretching did not have positive effects to prevent all cause injuries.[11] However, our current reviews reported reduced musculotendinous injury incidence, improved balance,[11] and reduced pain[12] with static stretching as part of the warm-up before an activity or as part of a separate training program (≥30 seconds per muscle group with a total duration of ≥5 minutes). Unilateral static stretching can also have global body effects with large magnitude ROM increases in non-stretched limbs.[1]

SUMMARY

Hence, while there are other activities such as dynamic stretching, PNF, resistance training, foam rolling, and vibration that can increase ROM, the reported demise of static stretching may be premature as it provides an array of fitness, performance, and health benefits and can be used in conjunction with other modalities where increased ROM is a priority of the goal activity. While resistance training and foam rolling can contribute to moderate magnitude increases in ROM, individuals who seek greater improvements may wish to augment these activities with stretch training.

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