

The Effects of Foam Rolling vs Massage Guns vs Dynamic Stretching on Trunk Forward Flexion

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Introduction

Massage guns and other self administered massage tools such as the foam roller have grown in popularity. Are they as effective as they claim to be? How do they compare to dynamic stretching? Are they worth it?

Purpose

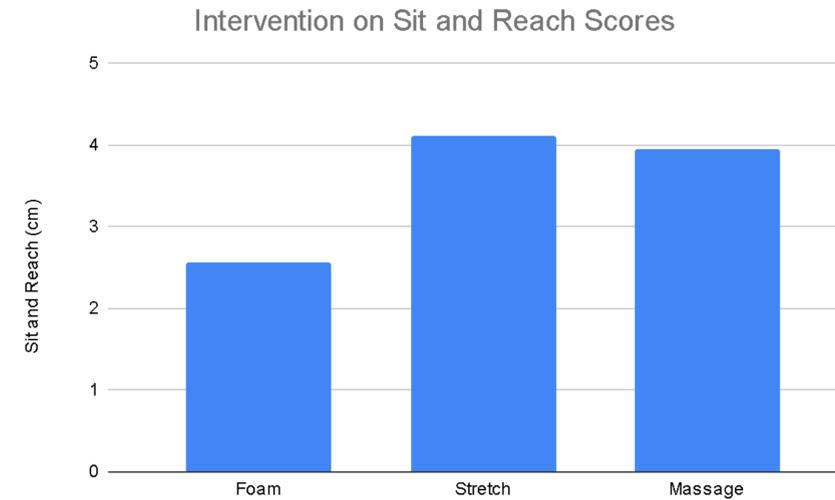
To test the effectiveness of foam rolling vs a massage gun in comparison to a dynamic stretching routine on trunk forward flexion.



Methods

- 14 healthy college-aged students, voluntary basis. Featuring: 7 female and 7 male participants.
- Each participant will visit the lab at the same time of day for each session to prevent bias (Guariglina et al. 2011)
- The muscles that are stretched during the back saver sit and reach test will receive treatment. This includes the calf muscles: gastrocnemius and soleus as group 1, the hamstrings muscles: semimembranosus, semitendinosus and bicep femoris as group 2 and the gluteus maximus as group 3 (Cooper Institute for Aerobics Research, 1994).

Results



Discussion

- Study results show that all three interventions improved sit and reach scores significantly. These results affirm Feldbauer (2015) that foam rolling improves flexibility test scores. Also, support Gellingham (2013) that dynamic stretching improves flexibility test scores as well.
- This study also shows significance in a massage gun's effect on acute flexibility.
- This does not mean the massage gun should replace dynamic stretching and foam rolling as a warm-up tool because stretching and foam roll provides other benefits such as increasing heart rate and blood flow, increasing temperature, and promoting synovial fluid release (Alonso-Calvete 2021).

Conclusion

Dynamic stretch routine, foam rolling and massage gun application all acutely improved sit-and-reach scores. Further investigation on long-term effects should be investigated further.

References

Alonso-Calvete, A., Padron-Cabo, A., Lorenzo-Martinez, M., & Rey, E. (2021). Acute Effects of Foam Rolling on Blood Flow Measured by Ultrasonography in Soccer Players. *Journal of Strength & Conditioning Research* (Lippincott Williams & Wilkins), 35(11), 3256–3259.

Baltaci, Gul & Un, N & Tunay, Volga & Besler, A & Gerçeker, S. (2003). Comparison of three different sit and reach tests for measurement of hamstring flexibility in female university students. *British journal of sports medicine*. 37. 59-61. 10.1136/bjsm.37.1.59.

Cooper Institute for Aerobics Research (1994) The Prudential FITNESSGRAM test administration manual. Cooper Institute for Aerobics Research, Dallas

Feldbauer, C. M., Smith, B. A., & Van Lunen, B. (2015). The Effects of Self-myofascial Release on Flexibility of the Lower Extremity: A Critically Appraised Topic. *International Journal of Athletic Therapy & Training*, 20(2), 14–19.

Gellingham, G. W., Hager, R. L., & Myrer, W. J. (2013). Evaluating Acute Changes in Joint Range-of-Motion using Self-Myofascial Release, Postural Alignment Exercises, and Static Stretches. *International Journal of Exercise Science*, 6(4), 310–319. *Int J Physiol* 2010;108:877-904.

Guariglia DA, Pereira LM, Dias JM, Pereira HM, Menacho MO, Silva DA, Cyrino ES, Cardoso JR. Time-of-day effect on hip flexibility associated with the modified sit-and-reach test in males. *Int J Sports Med* 32: 947–952, 2011

Short, F. X., & Winnick, J. P. (2005). Test Items and Standards Related to Flexibility/Range of Motion on the Brockport Physical Fitness Test. *Adapted Physical Activity Quarterly*, 22(4), 401–417.

Foam Rolling 1 Min / Muscle Group

Massage Gun 1 Min / Muscle Group

Dynamic Stretching 1 Min / Muscle Group



- 30-second leg swing R
- 30-second leg swing L
- 30-second alternating - hamstring scoops
- 30-second downward dog
- alternating heel peddles
- 30-second supine knee hug to hip flexion R
- 30-second supine knee hug to hip flexion L
- REPEAT

Table 1

	Pre-Intervention	Post-Intervention	P-value	Measurement (cm)	%Difference
Foam	50.77	53.34	0.0038	2.6	5%
Stretch	50.76	54.86	0.0009	4.1	7%
Massage	51.60	55.89	0.0020	4	7%

Table 2

	P-value	Measurement difference (cm)
Foam vs Stretch	0.0190	1.5
Stretch vs Massage	0.7894	0.1
Foam vs Massage	0.0102	1.4

The massage gun and stretch groups showed statistically significant improvements when compared to the foam rolling intervention shown in Table 2. Massage and stretch groups did not show statistical significance when compared to each other.