

Foam Rolling into Your Exercise: Why You Should Include it

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Introduction

Accessible, popular, simple, effective, and controversial. These are just some ways to describe self-myofascial release therapy, or more commonly known as foam rolling. Foam rolling has been introduced as a recovery tool to many people who struggle after exercising. Many people who struggle with RoM issues due to muscle tightness will try foam rolling to ease their symptoms and allow for more function in daily living. Foam rolling is able to alleviate the pain and soreness after both resistance and aerobic training, but also has more applications than just recovery. According to the article by Romero-Franco and researchers (1), adding foam rolling to a warm-up creates a lasting effect of increased range of motion (RoM) and increased performance in a counter movement jump (CMJ). A method that is not only able to improve performance but also aid individuals in their recovery from physical activity is astounding.

Every person who takes part in physical activity is subject to delayed onset of muscle soreness (DOMS), and it is a sign that a workout was effective in the areas that the individual feels sore. For some people this soreness can be debilitating and cause the person to cease exercising. According to Linke, Gallo, and Norman (2), 50% of people who start an exercise program dropout in 6 months. Foam rolling reduces DOMS and get individuals below their pain threshold so they can continue exercise. The purpose of this article is to identify and compare the effects of various types foam rolling to other recovery methods, and bring any risks associated with foam rolling into focus. Recent literature has identified foam rolling as an effective method to increase RoM and reduce soreness after exercise with minimal drawbacks. Foam rolling should be a common inclusion in recovery programs and be considered to be combined with dynamic warm-ups to increase performance.

Benefits of Foam Rolling

FR is said to aid with soft tissue stiffness, RoM, perception of pain, DOMS, and many other areas of physical activity. Proper care after an individual exerts themselves in either resistance training, aerobic exercise, or sport is just as important as performing the activity itself but is often neglected or forgotten entirely. The focus will start on the benefits mentioned and verifying their validity.

Range of Motion

Most research done on FR has observed and used RoM as a primary or secondary measure in determining its effectiveness. This includes passive (outside influence on the joint) and active (movement of the joint by the client) RoM. There was a study on FR of the quadriceps compared to a roller massage (RM) and the effects on hip flexion and extension in terms of passive RoM by Monteiro et al. (2019). (3) RoM was measured pre and post intervention with goniometers. Both interventions were performed for either 1 or 2 minutes, and RoM was measured at 0, 10, and 20 minutes post intervention. Both FR and RM increased range of motion with longer intervention of 2-min rather than 1-min. However, the FR group had a greater effect of the two. Hip flexion was increased by 19.2° Post-0, 13.0° Post-10, and 6.0° Post-20, while hip extension was increased by 8.6° Post-0, 4.6° Post-10, and 2.8° Post-20. (3) These may seem like small changes but according to ACSM guidelines, normal values of RoM at the hip for extension is 10-30° and flexion is 90-135°. Initially FR gained 21% of normal RoM of the flexion and 86% of RoM for extension. Even after 20 minutes of FR, there was still 7% for flexion and 28% for extension. Those are vast improvements and critical for daily function.

Another study from Su et al. (2017) compares FR, dynamic stretching (DS), and static stretching (SS) effects on RoM of knee flexion, sit and reach test, and peak torque during knee extension. (4) Researchers evaluated passive RoM by administering a modified version of the Thomas test. All three interventions were performed for 6 minutes after a 5 minute cycling warm-up. RoM motion was increased by all interventions, but FR ($11.17^{\circ} \pm 7.22$) had significantly better results than either DS ($2.73^{\circ} \pm 5.89$) or SS ($6.67^{\circ} \pm 6.63$). The same also held true for the sit and reach test (FR= $3.88\text{cm} \pm 3.77$, DS= $2.10\text{cm} \pm 1.91$, SS= $1.99\text{cm} \pm 2.30$) and both FR ($0.17 \pm 0.28 \text{ N}\cdot\text{m}\cdot\text{Kg}^{-1}$) and DS ($0.11 \pm 0.25 \text{ N}\cdot\text{m}\cdot\text{Kg}^{-1}$) achieved significantly greater peak torque during knee flexion compared to SS ($0.00 \pm 0.15 \text{ N}\cdot\text{m}\cdot\text{Kg}^{-1}$). (4) This study shows that FR has many benefits outside of just decreasing muscle tightness to increase RoM.

One of the main concerns of exercise professionals, is when an individual is just beginning to participate in physical activity, they may not know how to properly use FR. The variable that can vary no matter what type of foam roller is used is velocity that the device is used. In the study Wilke et al. (2019), the research was used to show the possible negative

effects of exaggerated velocities of FR. (5) The three groups were Fast (FFR), Slow (SFR), and control. The fast group used a cadence of 60bpm or 1-second per stroke, the slow used 6bpm or 10-seconds per stroke, and inactivity for the control. None of the groups saw increases nor decreases in RoM.(5) Results indicate that while exaggerated velocities do not harm RoM, it is not beneficial like the other studies had found.

Performance

Similar to the common misconception that individuals gain the most benefit from stretching before a workout, FR is thought to be best conducted after a workout is concluded. On the contrary, using FR in a warm-up has been shown to increase performance in multiple facets. The study from Romero-Franco (1) and researchers (2019) tested on the incorporation of FR to an 8-minute jog warm-up as the experimental group. The researchers designated their outcomes as RoM of knee and hip flexion, ankle dorsiflexion (ADF), as well as a vertical jump test, the countermovement jump (CMJ). One of the main findings is, when adding an appropriate amount of FR to a jogging warm-up, individuals see an increase to ADF as well as improve their CMJ compared to just a jogging warm-up. Increasing the RoM of ADF is beneficial for the biomechanics of lower extremities, making this a key point for injury prevention. Another finding is that incorporating FR into this warm-up also lengthens the benefits for a longer period time than the control group. (1)

Other areas of performance that have seen improvements due to FR include agility and speed. In the study conducted by Richman et al. (2019) multiple jump tests (CMJ, squat jump [SJ], and drop jump [DJ]), T-Test (TT), and a short sprint (SS) test were completed after different interventions. The interventions used were 6-minutes of light walking (LW) plus DS, or 6-minutes of FR plus DS. The FR intervention increased both SJ and CMJ from the LW intervention by, $1.72 \pm 2.47\text{cm}$ and $2.63 \pm 3.74\text{cm}$ respectively. There was no significant difference for the TT nor SS between FR and LW interventions. (6) This shows that while RoM and performances based on power, i.e. jump tests, benefit from FR, acceleration and agility performance does not increase

Delayed Onset of Muscle Soreness and Perceiving Pain

Foam rolling is a relatively new idea in the grand scheme of exercise science but has been thought of as a recovery tool since its recent creation. Any athlete that has participated at a competitive level, know that bringing your best to each performance is critical for progress.

This means overcoming the pain and soreness that naturally comes with training. From the study by Pearcey et al. (2015), recovery using FR after intense exercise is evaluated by pain threshold and multiple performance tests. (7) The intense exercise protocol was meant to induce delayed onset of muscle soreness (DOMS). FR was used as the primary recovery tool to combat the effects of DOMS and participants would undergo tests 24, 48, and 72 hours after initial protocol. Foam rolling was done for a total of 20 minutes (15 minutes actively rolling, 5 minutes rest) immediately after testing sessions. Five muscle groups were rolled over the course of the 20 minutes. The tests included a 30m sprint, standing broad jump, T-test, and strength endurance using squats. The protocol used to induce DOMS was highly effective and all participants felt the effects at session 1 and 2. DOMS also had an obvious negative effect on performance when FR was not used as an intervention. FR reduced the amount of pain threshold in 74% of participants for session 1, 94% in session 2 and 44% in session 3. Sprint time was significantly better in participants that foam rolled for the 24 (77% likely to help) and 72 (81%) hours post sessions compared to those who did not. FR also had a positive effect on broad jump at 24(72% likely) and 72 (86% likely). FR did not significantly reduce the effect of DOMS for the T-test however which aligns with the findings from Richman et al. (6)

The quote, “pain is relative” has held true through the ages. A level 3 of 10 for one person might be a 7 to another. So, when something alleviates some degree of pain no matter which person, it usually spreads like wildfire. FR has recently been favorite recommendation to reduce the effects of difficult workouts, but now there are many alterations to foam rollers, so which to use depends on the individual.

Types of Foam Rollers

Individualizing foam rollers creates a difficulty for an inexperienced client that causes them to figure out which works for their needs. Cheatham et al. (2019) (8) looks at three surface types and the effects on RoM and pain perception threshold (PPT), two topics already covered. All three types were solid foam, so no hollow piping in the middle but the texture varies from multilevel (ML), smooth surface (SSF), and grid surface (GS). All three FR devices were of the same density to keep the variable strictly to surface type. Passive knee RoM was increased in all three (SSF=3°, ML=5°, GS=6°) and PPT was increased as well

(SSF=14kPa, ML=179kPa, GS=182kPa). In both measures, participants get better results from GS, then ML, and lastly SSF.

Recently foam rollers have evolved even further with a vibration option added to some. These have begun to leak into recovery centers, but there is hardly any research on this type. Romero-Moraleda et. al (2019) is one of the few studies comparing vibrating foam rollers (VFR) and non-vibrating foam rollers (NVFR). (9) The study compared these two over a wide range of outcome measures, visual analogic scale (VAS), PPT, CMJ, O2 saturation, and RoM for hip extension and knee flexion. The findings show that both VFR and NVFR showcase similar results for PPT, CMJ, O2 saturation, and both RoM long-term. Immediately after VFR intervention however, both passive VAS and hip extension RoM are significantly higher in the VFR in individuals with exercise induced muscle damage.

Conclusion

This article review provides ample evidence that foam rolling is beneficial to a variety of people. Ranging from novice to competitive level athletes, foam rolling can and should be consider a staple for physical activity. Its positive effects on range of motion, pain management, and performance come with little drawback, both as a warm-up and a recovery tool. As the industry creates different types of foam rollers individuals should select according to their preference, but the grid texture has a slight edge on the other variants. While foam rollers do not provide improved results for a sustained amount of time, the results directly after use are significant enough to recommend keeping one in every household.

Apply It!

1. Novice and elite athletes will gain knowledge on the effectiveness of including foam rolling (FR) into exercise sessions to improve recovery and performance.
2. This article provides evidence that there are benefits when foam rolling tight soft tissue for at least 2 minutes.
3. If an area of soft tissue is too tender for treatment, foam rolling is an effective way to reduce perceived pain and allow the exercise professional more options.

Bridging the Gap

The exercise science community is always looking for the next big breakthrough technique, device, modality, or a combination of the three. With foam rolling's recent surge in popularity, there has been much debate on its benefits, and where best it fits in to exercise

programs. There is evidence of the positive effects on both athletic performance and aiding recovery that is significant enough to incorporate foam rolling into most programs, regardless of the individual. What should be individualized is the type of foam roller and whichever surface feels most comfortable to the person using it. When used in combination with other techniques such as dynamic stretching or a typical warm-up like jogging, the benefits of foam rolling increase greatly.

Summary Statement

Foam rolling helps soreness, perceived pain, and range of motion when used as a recovery technique, but also improves performance when implemented in conjunction with warm-up activities.

Pulled text

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Bio:

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