

WARM-UP AND STRETCHING FOR OFFICIALS

Proper warm-up and stretching are important to contest officials because both can **help reduce the risk of injury and improve performance**. Warming up also lowers ones blood pressure and increases blood flow to the heart which **reduces the risk of a heart attack**.

Warm-up improves the rate of muscle contractions, decreases reaction time, increases muscle temperature making the tissue more elastic, and increases circulation to the muscles resulting in a greater oxygen supply. Despite the lack of scientific documentation, it appears that all of these changes result in improved performance and decreased risk of injury.

Warm-up can be performed in three ways: passive, active, general warm-up, and active, specific warm-up. Passive warm-up involves the use of warm showers or whirlpools, heating pads, saunas, massage, or analgesic creams. Evidence has shown that **passive warm-up methods do not penetrate deeply enough into the muscle tissue to result in a significant temperature increase in the muscles** that perform most of the work during activity. In fact, passive warm-up techniques may result in a dilation of the blood vessels near the skin, drawing blood away from the muscles. Reduced blood flow to the muscles results in decreased performance and increased risk of injury. **Passive warm-up should never be the sole method of warm-up prior to activity.**

Active, general warm-up involves performing a few basic activities that require the use of major muscle groups. These activities may include walking, jogging, cycling, jumping rope, or calisthenics. Active, **general warm-up is fairly effective in raising the temperature of the major muscle groups**. This approach is better than passive warm-up, but it still may not warm up the specific muscles used when officiating.

Active, specific warm-up includes movements that are an actual part of the activity to be performed. A baseball player swinging a weighted bat, a tennis player practicing a backhand motion, a quarterback throwing passes, and an official practicing the various movements used during the contest are all examples of active, specific warm-up. **Active, specific warmup increases the temperature of the muscles and allows for rehearsal of specific skills that will be used in the activity. Active, general warm-up followed by active, specific warm-up is the best way to warm-up.**

The **warm-up period should last 5-15 minutes** depending on the intensity of the activity to follow. The more intense the activity, the longer the warm-up period should be. Warm-up intensity should gradually be increased until it is near that of the activity to be performed. A general rule is **one should break a light sweat when warming up, but not be working hard enough to breathe heavily**. A rest period of 5-10 minutes should follow the warm-up prior to competition. A warm-up remains effective in increasing muscle temperature for about 45 minutes after it has been completed, depending on the environmental conditions.

Stretching also prepares the muscles for work and reduces the risk of muscle injury. The benefits of stretching warm muscles are a decreased risk of injury, improved performance, delay in muscular fatigue, and reduction of muscle soreness. However, **stretching muscles that have not been warmed up may cause them to be more prone to injuries**, such as tears and strains. **Stretching exercises should only be performed after a period of active, general warm-up which lasts at least 5 minutes!**

Pain and/or bouncing during stretching are counterproductive and unsafe!

Pain and/or bouncing activate the stretch reflex in the muscles being stretched. The stretch reflex is a protective mechanism that causes the muscle to contract, or shorten, to avoid excessively stretching to the point of injury. You should feel as though you could maintain a stretch comfortably for five minutes, even though the recommended time is much less than that. **Stretch slowly to the point of mild tension, never pain!**

When stretching properly, a mild stretch should be felt in the belly of the muscle, not in any of the joints. For example, when stretching the hamstrings or quadriceps, the aim is to feel the stretch in the back or front of the thigh, not in the knee or hip.

The two most common and effective methods of stretching are static stretching and proprioceptive neuromuscular facilitation (PNF). Static stretching is performed by placing the body into a position that places a stretch on a group of muscles. That position is maintained for 30-60 seconds putting a constant, gentle stretch on the muscles. The stretch should be repeated 5-10 times.

An excellent time to perform static stretching is after a workout. Stretching at this time will help to alleviate delayed muscle soreness and has the added benefit of improving flexibility.

When utilizing PNF, instead of maintaining constant tension on the muscles being stretched, the muscles are stretched for 5 - 10 seconds. Then, while continuing to place a mild stretch on the muscles, they are mildly contracted (tightened) for 10 - 30 seconds. When this contraction phase is over, the stretch is continued for another 5 -15 seconds. This procedure of stretch - contract - stretch should be repeated 3-5 times before moving to the next muscle group to be stretched. **It is often necessary to do PNF stretching with a partner.**

In summary, officials should never use passive warm-ups as the only method of warming up before an activity. The best method of warming up is to use active, general warm-up followed by active, specific warm-up. When warming up, one should break a light sweat, but not be working hard enough to cause heavy breathing. Prior to activity, stretching exercises should only be performed after a period of active, general warm-up. Stretching after exercise can help alleviate delayed muscle soreness and improve flexibility. **Pain and/or bouncing are always counterproductive and unsafe when stretching!**

SOURCES: Anderson, Bob. Stretching, Shelter Publications, Bolinas, CA, 1980; Arnheim, Daniel, D. Modern Principles of Athletic Training, St. Louis:Times Mirror/Mosby College Publishing, 1989; Hedrick, Allen, United States Olympic Training Center. "Physiological Responses to Warm-up", National Strength and Conditioning Association Journal, Volume 14, Number 5, 1992; "Proper Stretching Can Prevent Injuries", National Federation News, November 1990; Rooks, Daniel, S. ScD. "Flexibility Training and Injury Prevention", Sidelines, National Youth Sports Foundation For The Prevention Of Injuries, Needham, MA, Summer, 1992; Stamford, Bryant, PhD. "How to Warm Up and Cool Down Your Work Out," The Physician and Sports Medicine, Volume 23, Number 9, September 1995; Yakutchik, Maryalice. "Stretch", USA TODAY, Thursday, March 19, 1992; Zimmerman, Jeff. "How Effective Are Analgesic Creams", Addressing Your Health, An informative newsletter about athletic health concerns for student-athletes, parents, and coaches in the Iowa City Community School District, Spring, 1992.

KEY POINTS TO PROPER WARM-UP AND STRETCHING

The warm-up period should last 5-15 minutes depending on the intensity of the activity to follow. The more intense the activity, the longer the warm-up period should be. Warm-up intensity should gradually be increased until it is near that of the activity to be performed. A general rule is one should break a light sweat when warming up, but not be working hard enough to breathe heavily. A rest period of 5-10 minutes should follow the warm-up prior to the activity. A warm-up remains effective in increasing muscle temperature for up to 45 minutes after it has been completed.

1. **Passive warm-up.** The use of warm showers or whirlpools, heating pads, massage, or analgesic creams **does not significantly warm up the muscles and should never take the place of actively warming up.**
2. **Active, general warm-up.** The use of activities such as walking, jogging, jumping rope, or calisthenics prior to activity **reduces the risk of injury.**
3. **Active, specific warm-up.** The use of movements that are an actual part of the activity to be performed **is an excellent way to warm-up.**
4. **Active, general warm-up activities should precede active, specific warm-up activities.**
5. **ALWAYS do active, general warm-up activities before stretching.**
6. **Stretching should result in a mild tension in the muscle being stretched. PAIN IS COUNTERPRODUCTIVE WHEN STRETCHING!**
7. **Hold each stretch for 30 - 60 seconds.**
8. **NEVER BOUNCE WHEN STRETCHING!**
9. **Stretching after a contest will help to alleviate possible muscle soreness** the next day and improve overall flexibility.
10. To prevent possible further injury, it is best to **consult a medical professional before stretching when an injury is present.**