

Warm-ups & Cool downs

Before a person takes part in an activity it is necessary to warm up first. **Warm-ups are required to prepare the body and mind for the activity about to be undertaken and it is necessary to ensure that the performer is ready to take part.**

Using specific exercises that remind the body of the positions and shapes that will be undertaken during the execution of the activity is the BEST way of avoiding strains, aches and potential injury.

Consequently, it is recommended that sport specific warm-ups are undertaken. Such warm-ups should place the body in positions that are akin to the sport. This has a number of effects.

- 1) **It reinforces the body shapes on the mind**
- 2) **It focuses the mind on the required positions**
- 3) **It allows the muscles to conform to the positions they will be taking up during the activity**
- 4) **It increases blood flow and temperature within the soft muscle groups**

Ballistic stretching should be avoided, that is vigorous activity that stretches the muscles to their limits then allows them to contract quickly.

All warm-ups should be low impact and allow for a steady increase in activity so that the performer can reach maximum intensity during training. Trampolining warm-ups can take place on the floor and on the trampoline. As a coach you will know your groups best, if they require group warm-up, off the trampoline in order to prepare, then use that, however, it can be just as effective to warm-up on the trampoline.

Within our sport of trampolining, it is important to note that a performer could be stood around for a longer period of time than they when actually performing. Maintaining focus is probably more important during training.

Cool-downs have been demonstrated as a much more effective method of injury avoidance than warm-ups and it is here that performers should use stretching exercises to avoid stiffness and soreness and reduce injury.

Flexibility and conditioning should not be confused with warm-ups and cool-downs. To perform the movements required by the sport of trampolining, a performer has to be able to obtain and maintain certain body shapes. To do that, a performer needs to have the necessary flexibility to reach the shape and maintain it. There are many exercises that will help performers attain these and these should be conducted away from the trampolines.

Below are a number of quotations I have found, plus references that you can follow-up for yourselves.

"A typical muscle stretching protocol performed during pre-exercise warm-ups does not produce clinically meaningful reductions in risk of exercise-related injury"

Pope RP, Herbert RD, Kirwan JD, Graham BJ.

"One of the most pervasive myths in sports is the belief that stretching before activity improves performance and reduces the risk of injury. Over a decade of biomechanical research on the acute and long-term responses of muscle to stretching has begun to show that this traditional teaching is wrong. Stretching is most effective for increasing range of motion when conducted during the cool-down phase of a workout. Warm-up should be based on movements similar to the event that gradually increase in intensity. The purpose of warm-up period is to prepare the body for more rigorous actions and to reduce the risk of injury. From a physiological perspective, low-intensity muscular actions increase blood flow and temperature in body tissues. Gradually increasing tissue temperatures mobilizes chemical energy stores (fat and carbohydrates) and makes several changes in muscle properties that improve subsequent performance. Biomechanically, we know that warmer muscles can elongate more and absorb more energy before being injured than unwarmed-up muscles. Several decades of research has shown the increased tissue temperature is the primary benefit of a warm-up"

[Dr. Duane Knudson](#) - Associate Professor, Department of Physical Education & Exercise Science, California State University

"If a warm-up does not include stretching activities, what should it actually look like? At least 10 minutes of continuous, submaximal exercise seem to be important, since such exertion may raise muscle temperature and downplay muscle stiffness. In addition, it appears that the classic, popular stretches could be replaced by dynamic activities which bear a close resemblance to the actions which are to follow during the post-warm-up workout or competition. For example, various, active drills could be completed which focus on the body's key joints and the important movements associated with a particular sport, and these drills could be performed with gradually increasing intensity, eventually mimicking the intensity of the most red-hot moments of one's sport(22). Muscular stiffness would certainly be decreased, and an athlete's neuromuscular system would be specifically ready to carry out the challenging work ahead. So what is the ultimate, deepest, best bottom line concerning stretching before workouts and injury prevention? To put it bluntly, there is no evidence at all to support the idea that pre-exercise stretching reduces the risk of injury; if you want to decrease your chances of getting hurt, the research indicates that upgrading your fitness and carrying out activities which decrease your muscles' active stiffness will probably do more than a flood-tide of pre-exercise stretching to keep the injury bug at bay. If you want to stretch, save it for your post-workout routine. "

Owen Anderson – Sports Injury Bulletin

References

- (1) 'Should Static Stretching Be Used During a Warm-Up for Strength and Power Activities?' Strength and Conditioning Journal, Vol. 24(6), pp. 33-37, 2002
- (2) 'A Randomised Trial of Pre-exercise Stretching for Prevention of Lower-Limb Injury', Medicine and Science in Sports and Exercise, Vol. 32(2), pp. 271-277, 2000
- (3) 'Injuries in Australian Army Recruits, Part III: The Accuracy of a Pretraining Orthopedic Screen in Predicting Ultimate Injury Outcome', Military Medicine, Vol. 162, pp. 481-483, 1997
- (4) 'Effects of Static Stretching on the Maximal Length and Resistance to Passive Stretch of Short Hamstring Muscles', Journal of Orthopaedic Sports Physical Therapy, Vol. 14, pp. 250-255, 1991
- (5) 'Viscoelastic Response to Repeated Static Stretching in the Human Hamstring Muscle', Scandinavian Journal of Medicine and Science in Sports, Vol. 5, pp. 342-347, 1995
- (6) 'Rates and Risks for Running and Exercise Injuries: Studies in Three Populations', Research Quarterly for Exercise and Sport, Vol. 58, pp. 221-228, 1987
- (7) 'Predicting Lower-Extremity Injuries among Habitual Runners', Archives of Internal Medicine, Vol. 149, pp. 2565-2568, 1989
- (8) 'The Ontario Cohort Study of Running-Related Injuries', Archives of Internal Medicine, Vol. 149, pp. 2561-2564, 1989
- (9) 'New Study Links Stretching with Higher Injury Rates', Running Research News, Vol. 10(3), pp. 5-6, 1994
- (10) 'Muscle Damage Induced by Eccentric Contractions of 25% Strain', Journal of Applied Physiology, Vol. 70, pp. 2498-2507, 1991
- (11) 'Acute Muscle Stretching Inhibits Maximal Strength Performance', Research Quarterly for Exercise and Sport, Vol. 69, pp. 411-415, 1998
- (12) 'Identification of a Threshold for Skeletal Muscle Injury', American Journal of Sports Medicine, Vol. 22, pp. 257-261, 1994
- (13) 'Influences of Strength, Stretching and Circulatory Exercises on Flexibility Parameters of the Human Hamstrings', International Journal of Sports Medicine, Vol. 18, pp. 340-346, 1997
- (14) 'Physiology of Range of Motion in Human Joints: A Critical Review', Critical Reviews in Physical and Rehabilitative Medicine, Vol. 6, pp. 131-160, 1994
- (15) 'Strength, Flexibility, and Athletic Injuries', Sports Medicine, Vol. 14, pp. 277-288, 1992
- (16) 'Flexibility and Its Effects on Sports Injury and Performance', Sports Medicine, Vol. 24(5), pp. 289-299, 1997
- (17) 'Effect of Passive Stretching and Jogging on the Series Elastic Muscle Stiffness and Range of Motion of the Ankle Joint', British Journal of Sports Medicine, Vol. 30, pp. 313-318, 1996
- (18) 'Passive Properties of Human Skeletal Muscle during Stretch Maneuvers', Scandinavian Journal of Medicine and Science in Sports, Vol. 8, pp. 65-77, 1998
- (19) 'Stretching during Warm-Up: Do We Have Enough Evidence?', Journal of Physical Education, Recreation, and Dance, Vol. 70(7), pp. 24-27, 1999
- (20) 'Investigation into the Effect of Static Stretching on the Active Stiffness and Damping Characteristics of the Ankle Joint Plantar Flexors', Physical Ther. Sport, Vol. 2, pp. 15-22, 2001
- (21) 'Thermal Effects of Skeletal Muscle Tensile Behavior', American Journal of Sports Medicine, Vol. 21(4), pp. 517-522, 1993
- (22) 'Dynamic Warm-Ups', Sports Coach, Vol. 24(1), pp. 20-22, 2001

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