

# To Loose Too Much: Stretching

By Vern Gambetta

Perhaps the most misunderstood and controversial component of training is flexibility. Much of this controversy has arisen because of the cult of flexibility that would lead us to believe that our athletes must become contortionists in order to prevent injuries and perform athletic movements. This is a gross misapplication of the importance of flexibility. Flexibility is both an anatomical quality as well as a physical ability. As an anatomical quality it is determined by the shape of the joints. As physical quality it is the ability to perform movements through a large amplitude. We all know that flexibility is necessary for efficient movement, but we are less sure how much is needed, where it is needed and how it is most efficiently developed. How much of flexibility is determined by joint structure and body structure? Is one particular method more advantageous than another? What is the best time in the workout to develop flexibility? What are the flexibility requirements for various sports? Is it possible to be too flexible?

The conventional definition of flexibility is the range of motion that is available at a particular joint. We must move beyond this and recognize that flexibility is not a static, but a dynamic controlling quality that allows the joint to go through as large a range of motion as can be controlled. The controlling nature of flexibility governs the range of motion used in skill performance and controls the length of the movement available for force production and reduction. Conceptually it is best to use the term "Mostability." Mostability is a synergistic combination of motion and stability. According to Gray it is "The ability to functionally take advantage of just the right amount of motion at just the right joint in just the right plane in just the right direction at just the right time." (Gray 1996) The opposite of this is instability which is any degree of mobility that cannot be controlled.

Dynamic range of movement as expressed in sports movements is significantly greater than what can be expressed statically due to the elasticity of the involved tissue and reciprocal inhibition which allows the opposing muscle group to relax. That is why a pitcher can externally rotate at the shoulder beyond ninety degrees when pitching, but statically may not be able to get within ten to fifteen degrees of that dynamic range.

Perhaps the reason flexibility is thought of as a static quality is that it is often measured statically by tests such as the sit & reach test. Experience as well as research has shown that there is no relationship between static flexibility and dynamic performance. Some of the fastest and most explosive athletes that I have worked with have been "tight." Conversely some of the most often injured athletes were the individuals who were most "flexible" in the conventional sense. We must remember performance is not a stretching contest. "...While there is no proven connection between joint looseness and overall athletic performance, too much looseness can be a real liability in sports that require rapid changes of direction and acceleration, such as basketball, tennis, and soccer, while too little of it would seriously restrict a gymnast or a figure skater; and so the quality of joint looseness or flexibility is largely sports specific." (Arnot and Gaines, 1984) The goal of flexibility training is not a "gummy" effect where the athlete has no joint integrity. "Flexibility, then, is an important factor in prevention of injuries and in efficient skill performance, but to satisfy these purposes, flexibility must be accompanied by ligamentous and muscular stability surrounding an articulation." (Kreighbaum and Barthels, 1990) Joint integrity must never be compromised for range of motion. When this occurs the athlete will be predisposed to injury. Observing this concept will give the control and range of motion necessary to efficiently and safely perform the required skill. The goal of flexibility training is to functionally lengthen and strengthen. According to Kreighbaum and Barthels: "Adequate strength in extreme joint positions also is necessary to prevent joint structure damage by the outside force." (Kreighbaum and Barthels, 1990) Therefore it is impossible to talk about flexibility without talking about strength. Improper strength training can impair flexibility, not because the athlete becomes too muscular or muscle bound, although that is a possibility, but because of

improper development of a muscle or a group of muscles that results in restriction of motion around a joint. My personal experience is that a properly designed strength training program will enhance flexibility rather than retard it because of the control and stability factor that strength lends to the movement.

Many of the problems with flexibility begin with it's placement within the structure of the workout. Stretching is not warm-up. Too many people equate stretching with warm-up. You must warm-up in order to effectively stretch to gain flexibility. Stretching should occupy a small part of a well designed warm-up. Static stretches before warm-up or competition cause tiredness and decrease coordination. They have a calming effect therefore are best used as part of the cool-down.

Static stretching improves static flexibility. Dynamic stretching improves dynamic flexibility. Therefore it is not logical to use static stretches to warm-up for dynamic action.

There are five factors that determine flexibility:

The elasticity and the length of the involved muscles and tendons. This is determined genetically but can be altered through a well designed strength training program.

The structure of the joints. The shoulder is inherently more flexible than the knee or hip because of structure of the articulation.

The level of basic coordination in order to allow motor control of the involved joints.

The fitness level of the athlete.

The psychological/emotional state of the athlete. The athlete who is 'up tight' or tense by nature tends to be less flexible.

Functional flexibility is best exhibited by economy of movement in the desired sport skill. The athlete who is too "tight" does not have this economy of movement. Assessing flexibility is best done through observation of the athlete in their respective sport activity. Are they smooth in their movements? Can they get in the required positions dynamically? Has there been a pattern of injuries? After these questions are asked and there is a deficiency then it time to do a more formal functional assessment. Flexibility is a dynamic controlling quality then it should be tested as such. The tests should be functional and dynamic that make comparisons intra-individual rather than inter-individual. Compare left to right and identify any deficiencies. Observe the movement and see if the deficiencies identified on the tests are manifested as performance deficiencies or in any way impair performance. The results are highly individual therefore we should not compare flexibility norms. What about the traditional sit and reach test? Fundamentally it is a mistake to have the sit & reach on the Presidents Physical Fitness Test battery for the previously mentioned reasons. What makes it even more fallacious is to have norms set that make inter individual comparisons on what is a highly individual physical quality.

What are better ways to test flexibility? Consider the tests in the book "Lower Extremity Functional Profile" by Gary Gray With Team Reaction as a start for you to develop your own functional flexibility profile. I do not think we should try to come up with universal flexibility test that address all populations. It is more useful and practical to develop test that measure mostabiliy in positions that the athlete will have to perform in competition.

The optimum time to develop flexibility is post workout. At that time the temperature of the involved tissue is highest, consequently the greatest gains can be made at this time. Post workout flexibility work also has a restorative regenerative effect by calming the athlete and restoring the muscles to their resting length, stimulating blood flow and reducing spasm. Unlike other physical qualities flexibility can be improved from day to day. Once range of motion is increased or developed to the desired level it is easy to maintain that range of motion. Less work is needed to maintain flexibility than is needed to develop flexibility.

Kurz in "Stretching Scientifically - a guide to flexibility training" presents a convincing argument for including an early morning stretching session. This session consists of a few rhythmic dynamic stretches to lubricate the joints. Kurz recommends that no isometric static stretches be done in the morning because they are too exhausting to the nervous system. "The purpose of this stretching is to reset the nervous regulation of the length of your muscles for the rest of the day." (Kurz, 1994) This session should take ten to fifteen minutes. It is an interesting idea, give it a try. The athletes that I have used it with have felt that it helped them better prepare for workouts later in the day.

The work of Drabik highlights the growth and development consideration for development of flexibility. At Preschool age there is no need for any development. Natural play and movement will take their joints through full ranges of movement. Elementary school - At the ages of six to ten the mobility of the shoulder and hip is reduced. Therefore to prevent any permanent reduction in mobility at these joints it is necessary to do dynamic stretches at the hip and shoulder. Drabek recommends that children of this age "Avoid static stretches of all kinds (passive, active, isometric) in training preadolescent children because excitation dominates over inhibition in a child's nervous system. This means that it is hard for children to stay still, relax and concentrate properly on feedback from their muscles for periods as long as static stretches require." (Drabek 1996) The middle school ages is the developmental stage where flexibility should receive an emphasis. With rapid growth that occurs in this age range flexibility should focus on the muscles made tight by the rapid growth of bones. If this is not done the ultimate effect will be bad posture and susceptibility to injury. After the growth spurt flexibility training can be increased and become more sport specific, very similar to an adult program.

In summary it is important to consider the following flexibility training principles when incorporating flexibility into the total training program.

- Use moderation and common sense.
- Flexibility is only one component of fitness do not overemphasize it.
- Do not force a stretch. If it hurts don't do it.
- Flexibility and strength training should be combined.
- Be joint specific in the development of flexibility.
- Emphasize dynamic flexibility.
- Do not use bouncing ballistic stretches.
- Orient the body in the most functional position relative to the joint or muscle to be stretched and relative to the athlete's activity.
- Use gravity, body weight, ground reaction forces as well as changes in planes and proprioceptive demand to enhance flexibility.
- Develop a flexibility routine specific to the demands of the sport and the qualities of the individual athlete.

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