An Introduction to Plyometrics

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What are Plyometrics?

Speed and strength are integral components of fitness found in varying degrees in virtually all athletic movements. Simply put the combination of speed and strength is power. For many years coaches and athletes have sought to improve power in order to enhance performance. Throughout this century and no doubt long before, jumping, bounding and hopping exercises have been used in various ways to enhance athletic performance.

In recent years this distinct method of training for power or explosiveness has been termed plyometrics. Whatever the origins of the word, the term is used to describe the method of training which seeks to enhance an individual's "explosive" reaction through rapid and powerful muscular contractions.

Muscle Mechanism

The maximum force that a muscle can develop is attained during a rapid eccentric contraction. However, it should be realised that muscles seldom perform one type of contraction in isolation during athletic movements. When a concentric contraction occurs (muscle shortens) immediately following an eccentric contraction (muscle lengthens) then the force generated can be dramatically increased. If a muscle is stretched, much of the energy required to stretch it is lost as heat, but some of this energy can be stored by the elastic components of the muscle. This stored energy is available to the muscle only during a subsequent contraction. It is important to realise that this energy boost is lost if the eccentric contraction is not followed immediately by a concentric effort. To express this greater force the muscle must contract within the shortest time possible. This whole process is frequently called the stretch shortening cycle and is the underlying mechanism of plyometric training.

Choose the method to fit the sport

The golden rule of any conditioning programme is specificity. This means that the movement you perform in training should match, as closely as possible, the movements encountered during competition. Softball players are looking at both lower and upper body explosiveness.

Conditioning for Plyometrics

Higher than normal forces are put on the musclosketal system during plyometric exercises so it is important for the athlete to have a good sound base of general strength and endurance. Most experts state that a thorough grounding in weight-training is essential before you start plyometrics. Nobody should start an intense plyometrics workout without proper preparation beforehand. However, less intensive plyometric exercises can be incorporated into general circuit and weight training during the early stages of training so as to progressively condition the athlete. Simple plyometric drills such as skipping hopping and bounding should be introduced first. More demanding exercises such as flying start single-leg hops and depth jumps should be limited to thoroughly conditioned athletes.

Young athletes

Some authors suggest that moderate jumps can be included in the athletic training of very young children (Lohman, 1989). However, great care needs to be exerted when prescribing any training procedures for preadolescent children. Because of the relatively immature bone structure in preadolescent and adolescent children the very great forces exerted during intensive depth jumps should be avoided (Smith, 1975).

Summary

Plyometric type exercises have been used successfully by many athletes as a method of training to enhance power. In order to realise the potential benefits of plyometric training the stretch-shortening cycle must be invoked. This requires careful attention to the technique used during the drill or exercise. The rate of stretch rather than the magnitude of stretch is of primary importance in plyometric training. In addition, the coupling time or ground contact time must be as short as possible. The Challenge to you as coach or athlete is to select or create an exercise that is specific to the event and involves the correct muscular action. As long as you remember specificity and to ensure there is a pre stretch first then the only limit is your imagination.

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