

PLYOMETRIC TRAINING

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What Are Plyometrics?

Plyometrics are drills that enhance an athlete's explosive reaction by training rapid and powerful muscular contractions. This is accomplished by placing the muscles and tendons under a pre-stretch immediately prior to their firing. By pre-stretching the tissues the body's neuromuscular system is taught to fire the muscle at a much faster rate of speed. This improves power output for sprinting and jumping.

Pre-requisites for Plyometric Training

Plyometrics can be used by most athletes by changing intensities based on the athlete's stage of physical development. The basic pre-requisites are:

1. Appropriate range of motion at the hip, knee and ankle joints.
2. Strength Relative to Bodyweight
 - Demonstrated by the ability to land on the ball of the foot and not flat footed or on heels.
3. Technique
 - Ability to land and remain in the athletic ready position (Fig 1.).
4. Proper Surface and Shoes
 - Floor should provide a degree of shock absorption.
 - Shoes should be court or cross-trainers.

Athletic Ready Position

The athletic ready position is one in which the athlete's center-of-gravity is lowered and balanced. This is accomplished by bending the knees which will lower the hips, slightly rising onto the balls of the feet and keeping the shoulders in line with the knees (Fig 1.). This allows the athlete to be balanced and powerful. This is the position the athlete should be in prior to jumping and when returning from a jump.

Technique Technique Technique

Plyometric drills will only achieve the desired results if done properly. Poor technique will lead to unwanted results and potential injury. Once the athlete has learned how to stay in the athletic ready position then jumping can be started. At any time during the plyometric routine if correct form is lost the drill should be stopped and corrected.

Warm-Up and Cool-Down

It is imperative that the body be properly prepared prior to the plyometric workout. This can be accomplished by performing 5 to 10 minutes of cardiovascular activity followed by a complete lower body flexibility routine. This should include the gluteals, iliotibial band, hip flexors, hamstrings, quadriceps, straight and bent leg calf stretches. Each stretch should be held 15 to 20 seconds with 3 to 5 repetitions performed. Additionally low grade lunging, skipping and jogging is effective in preparing the muscles and tendons for the more aggressive movements to follow. To alleviate post-exercise soreness and return the exercised tissues to pre-exercise length

a gradual cool-down and longer duration stretching routine should be done. The post-exercise stretches should be held 30 seconds with 3 to 5 repetitions.

Low Intensity Plyometric Routine

Low intensity plyometrics involve basic movement patterns and two-legged jumps. A four square pattern can be used (Fig. 2). The athlete starts in box A in the athletic ready position and jumps front to back from box A to B. This can be done for a specific time frame 10 to 20 seconds or for a set number of repetitions 10 to 20. Other low intensity movements are box A to D, box A to B to C to D, and box A to D to C to B. These basic movement patterns allow the athlete to learn to control their body in time and space. This routine can be performed 2 times a week.

- Tips: Remain in athletic ready position
- : Keep feet parallel to each other so your body is not angled
 - : Movements should be straight lines

Moderate Intensity Plyometric Routine

The four square pattern can also be used for moderate intensity plyometrics that initiate single leg movements. Start by performing the low intensity plyometric routine and add diagonal movements that include box A to B to C, and box A to C to B. After completion of the two legged drills the following single leg drills can be started. Start with box A to B and then box A to D. Each leg should be done for 5 to 10 seconds or 5 to 10 repetitions two times per week.

- Tips: Keep foot pointed straight ahead at all times
- : Single leg drills can be gradually progressed into all movement patterns
 - : Quality of movement is more important than speed of movement
 - : Once quality is assured then increased speed

High Intensity Plyometric Routine

Start by doing all previously mentioned double and single leg drills. At this point physical barriers of 2" to 20" can be incorporated into double leg jumps. The barriers should be a soft foam material to avoid injury in case you knock them over. Start by placing a 2" foam between box A to D. Jump side to side over the barrier, remaining in proper athletic ready position, landing on the balls of your feet and exploding back over the barrier. This can also be done with the barrier between boxes A to B for front to back jumps. Timed sequence of 5 to 10 seconds or 5 to 10 repetitions are performed. The barrier jumps can be done 1-2 times per week.

- Tips: Start with small heights
- : Master the small heights before progressing
 - : Use arms to help explode body upward



Figure 1



Figure 2

Summary

Plyometric exercises can be very beneficial for increasing an athlete's balance and power. This however requires careful attention to technique used during the drills and a gradual progression of activity appropriate to the athlete's stage of physical development.

Questions should be directed to: rocky@accelerationtraining.com