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### **Assessments of Some Selected Plyometric Exercise**

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#### **Abstract**

*Plyometrics includes explosive powerful training exercises that are trained to activate the quick response and elastic properties of the major muscles in the body. It was initially made famous by Soviet Olympians in the 1970s, providing the core element in the strength programs of elite sporting athletes worldwide. Sports using plyometrics include basketball, tennis and volleyball as well as the various codes of football. Technique of jumping is also very important when executing plyometric exercises. In essence, the athlete goes into a slight squat (crouch) upon landing in which the hip, knee, and ankle joints flex*

#### **Introduction**

Plyometric exercises enable the athlete to overload and train his/her body in a specific position required for a specific competition situation. Today the high level of professional sport focuses on specific training and plyometric training is a form of overload exercise.

Plyometric exercises, in conjunction with a weight-training programme, can lead to the execution of specific aspects of exercises. Plyometrics, also known as "jump training" or "plyos", are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power (speed-strength). This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping. Plyometrics are primarily used by athletes, especially martial artists, sprinters and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree. Functional training has its origins in rehabilitation. Physical and Occupational therapists and Chiropractors often use this approach to retrain patients with movement disorders. Interventions are designed to incorporate task and context specific practice in areas meaningful to each patient, with an overall goal of functional independence

**Assessments of Plyometric Exercises:** Following exercise was considered for the study

- **Squat Jump** : Set your feet in a squatting base, as if you are about to squat with a heavy load, with hands behind your head. Descend into a parallel position and then drive up as high as possible, making sure to consciously push as hard as you can through your ankles, knees, and hips. Upon landing, attempt to absorb the load of the jump by landing on the front half of your feet and then sinking back onto your heels as the hips descend into the next squat.
- **Bent knee sit ups:** Participants was laid on back with knees bent, flat on the floor close to the buttocks and Hands on the thigh, then participant exhaled on the way upward and commence curl with the shoulders then the upper back after that participant brought hands to the top of the knees and hold momentarily. In second phase participant lower the torso to the ground and inhaled while returning to the start position. These steps were repeated.
- **Squat thrust:** Participant kept their hands on the floor with the arms held straight while the legs are straightened out behind and quickly drawn in towards the body again stand with feet

shoulder-width apart and arms at sides. Now participant Pushed hips back, bent knees, and lower his body as deep as you can into a squat. As he squat down, placed hands on the floor in front of him, and then quickly kick his legs backward into a push up position, reverse the movement to return to start. Now these steps were repeated.

- **Strudel thrust:** For doing this exercise participant worked over a low secure step box, taken his feet from the side of the step box, jumping up on to the box. Once participant's feet were together, jump up and out again, taking participant's feet either side of the step box, in order to straddle it, participant avoid lowering on to the step. Used his arms to help and generate an upward lift.
- **Bench press:** For doing bench press participant started position was the lying on a bench, with the shoulder blades pinched together to create a stable, solid base for the press, also used in power lifting to reduce the range of motion. Participant kept his feet flat on the ground or at end of the bench, with the buttocks always in contact with the bench. Participants were arching their back to provide greater stability and to reduce their range of motion allowing them to move more weight. Different grip widths used to increase or decrease the range of motion and place more or less emphasis on particular muscles. The movement begins by lifting the bar off the uprights and lowering it until the bar is motionless on the chest before being pressed under control to the start position. After the desired number of repetitions, the participant returned the bar to the uprights. Because the load on the bar above the chest can be heavy, a spotting partner increases the safety of the movement.
- **Pull ups:** Participants were grasped the overhead bar using either an overhand grip (palms facing away from body) or underhand grip (palms facing toward body), with the arms fully extended. Then participant raised his body until the chin clears the top of the bar, then lowers again to a position with the arms fully extended. As many full pull-ups as possible were performed.
- **Depth jump:** In depth jump mainly quadriceps (thigh), hamstrings, gluteus (buttocks), calf Muscles are involved. For doing depth jump ankle extension, knee extension, hip extension these Joint movements are required. Depth jump is applicable to Running and jumping based sports such as tennis, football, basketball and high jump etc. for doing depth jump participants were stood on top of a strong platform, its height was 0.5m to 0.8m. Then he stepped slightly forward off of the platform. After that participant was land toward his forefeet; then reacted as quickly as possible to the ground and jump immediately back up into the air. Participant used his arms to add to speed by drawing them back prior to stepping off the platform and swinging them vigorously upward, as his feet touched the ground. Kept his back in neutral alignment, i.e. not arched or rounded. Repeated this action.
- **Front Box Jump:** The Front Box Jump is one of the most-used plyometric exercises because it is very effective at increasing one's vertical jump. It strengthens quadriceps and glute muscles, which are essential for jumping.

#### Procedures of test:

1. Place a plyo box 6 inches in front of you.
2. Get into a squat position with your feet about shoulder-width apart.
3. Squat and explode up using your entire body, including your arms.
4. Land softly on the box on the balls of your feet.
5. Step down, reset yourself and repeat.

6. You can either increase box height or add weight via weighted vest, barbell or dumbbells to increase the difficulty.

#### Weighted Lateral Jumps

Similar to Lateral Box Jumps, this plyometric exercise builds lateral leaping ability and strength. It also strengthens the ankles and calf muscles. This movement focuses more on quick feet and agility.

#### Procedures of test:

1. Place a barbell on the ground with a weighted plate on each side.
  2. Adjust the weighted plate size according to your jumping ability—the bigger the weight, the higher the bar.
  3. Stand about 6 inches to the side of the barbell.
  4. Hold a weighted plate or medicine ball over your head. Adjust the weight according to your ability.
  5. Bend your knees slightly with your feet close together.
  6. Hop over the bar and back continuously, staying light on your feet.
- Sets/Reps: 3x15 (over and back counts as one rep)

#### Broad Jumps

Broad Jumps build true leg strength, because you don't take a first step or get a running start. They require you to perform a deep Squat to propel yourself forward as far as you can, using your quadriceps and glute muscles.

#### Procedures of test:

1. Use a surface that has some give to it.
2. Get into a squat position with your feet shoulder-width apart facing an open space.
3. Squat down deep and explode up, using your entire body to thrust yourself forward.
4. Land softly on the ground and immediately transition into your next rep.

#### Skater Jumps

Skater Jumps build lateral strength and power in the quadriceps and glute muscles. They also place the entire load on one leg, which helps with balance and reduces the tendency to favor the stronger leg during two-legged jumps.

#### Procedures of test:

1. Get into a squat position with your feet close together and the majority of your weight on your right leg.
2. Push off your right leg to the opposite side.
3. Land softly on your left leg and move your right leg behind it like you were performing a Curtsy Lunge.
4. Repeat on your left leg. That's one rep.

#### Scissor Jumps

This plyometric exercise is essentially a Jumping Lunge in place. Scissor Jumps increase adductor and glute muscle strength with the legs in a stretched position.

#### Procedures of test:

1. Get into a standard lunge position, keeping your back straight and your knees and toes forward.

- 2.Squat down and explode up, switching leg positions in mid-air.
- 3.Land softly and immediately transition to your next jump.
- 4.Perform the same movement, switching your leg position each time.

### **Dot Drill**

The Dot Drill increases foot speed and quickness. It also increases ankle and calf strength, like Weighted Lateral Jumps.

#### **Procedures of test:**

1. Place a dot mat in front of you or mark five spots like dots on a dice.
2. Start with your feet on the two corner dots at the front end of the mat.
3. Hop slightly off the ground, bringing both your feet together on the middle dot.
4. Without stopping, jump slightly and separate your feet so each foot lands on a corner dot at the far end of the mat.
5. Repeat the movement in reverse. That's one rep.
6. Repeat 10 times.
7. The second sequence is the same as the first, except once you reach the far end of the mat moving forward, turn around and repeat the movement going forward instead of in reverse.
8. Perform that sequence 10 times.
9. The third sequence requires you to hop to each dot on one leg.
10. Start from the dot in the front right corner.
11. On one leg, hop to the middle dot, then the far right dot, then the far left, then hop backwards to the middle dot, then to the front left, and back to the front right. That's one rep. Repeat 10 times.
12. Perform the same sequence on the other foot 10 times, and then 10 times using both feet close together.

### **Lateral Box Shuffles**

These mimic Skater Jumps but they focus more on lateral foot speed and quickness than explosive strength.

#### **Procedures of test:**

- 1.Place a plyo box to the side at about shin height.
- 2.Stand on the box with your right leg. Keep your left foot on the floor about 6 inches away.
- 3.Get into a squat position and lift your left foot up onto the box while simultaneously placing your right foot on the floor on the other side of the box.

### **Barbell Squat Jumps**

This exercise adds weight to normal Bodyweight Squat Jumps, making it more difficult. When you perform a normal jump, it seems much easier and you can jump higher by increasing your explosive strength and power. Do not add so much weight that you are unable to perform a good jump.

#### **Procedures of test:**

1. Set up a free-weight squat rack, adding weight to the barbell that allows you to perform 10 repetitions.
2. Lift the barbell off the rack and get into a squat position with your feet about shoulder-width apart.
3. Squat down and explode up, jumping off the ground.

4. Land softly and immediately transition into your next rep.

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