

Practical Progressions for Upper Body Plyometric Training

Mark Nutting, CSCS, NSCA-CPT

Plyometric training utilizes the reversible muscle action of eccentric deceleration to concentric acceleration. The rapid stretching of the muscle during the eccentric phase sets off the myotatic or stretch reflex, which elicits a contraction from the muscle being stretched. As the eccentric action slows to a stop, connective tissues are stretched and store elastic energy. Now a maximum voluntary concentric contraction is added to the myotatic reflex, which then releases the stored elastic energy producing a more powerful positive action. (See the Push Press as an example of a classical plyometric exercise.)

The start of the eccentric muscle action to the start of the concentric contraction is called the amortization phase. The shorter the amortization phase, the greater the stretching of connective tissue and amount of stored elastic energy. This will give a greater plyometric training effect, but also increases the risk of injury. Because individuals' upper bodies are less accustomed to these kinds of stresses and the increase in eccentric forces increases the chance of muscle soreness, careful progressions are essential.

Considerations

Specificity

Choose exercises that relate most to the activity to be improved upon.

Planes of movement

Try to integrate all three planes of movement (sagittal, frontal, transverse) into the workout. (See Rotational Slams Against a Wall as an example of a multi-planar exercise.)

Proper warm-up and cool-down

As with all training, a proper warm-up prepares the tissues for more intense activity, the cool-down gradually brings the body back down to resting levels.

Progression

All upper body drills can be modified so that almost anyone can do some version of them. Keep in mind that benefits from plyometric training are on a continuum. Maximum results are achieved through maximum effort. But, it is not all or nothing. Significant gains in functional strength, proprioception, and power can be made from less than maximal effort.

The following are generalized progression cues:

1. Strengthen the core to be able to stabilize

Most upper body drills require the ability to stabilize the core. Engaging the core musculature to hold proper form should be stressed from the beginning. It should also be a limiting factor; when the core can no longer stabilize, the drill is over.

2. Simple to complex

Master the simple to coordinate exercises before trying more complex.

3. Lighten the load when starting out

By lightening the load, you lessen the risk of injury. i.e. Use a soccer ball before a medicine ball. Use a lower percentage of your body weight by changing the angle of the body or shortening the lever arm. (See Figures 1 & 2).

4. Eccentric control before eccentric to concentric

Simply put, learn to absorb and control the landing before progressing.

5. Bilateral before unilateral

A bilateral exercise shares the stress between the two limbs, whereas a unilateral exercise puts more stress on that single limb. Generally, it's safer to start with a bilateral exercise. (See the Medicine Ball Slams progression to One Arm Slams as an example of progressing from a bilateral to a unilateral exercise.)

6. Stable before unstable

Individuals should master the exercise on a stable surface before moving onto an unstable surface. Softer, unstable surfaces such as: half dome stability balls, disks, foam pads, etc. elongate the amortization phase and lessen the plyometric training effect, but increase the proprioceptive training effect. The choice to integrate instability depends on the individual's needs. (See the Half Dome Ball Alternating Push Over-the-Top as an example of an exercise that can be performed on a stable surface or an unstable surface.)

7. Low intensity before high intensity

While maximum results may not come from doing an exercise at a lower intensity, it does allow an individual to safely learn the exercise and prepare the musculature to withstand higher intensities in the future.

8. Build from slow speed to fast and longer amortization to shorter

This will also increase the risk of injury. So, when starting out with a new exercise, slow the action down and lengthen the amortization phase until you are ready to progress.

Volume of training

Much discussion arises when talking about the number of contacts/impacts you should have in a workout. Jumping rope is a plyometric exercise and if you jumped for 20 minutes you might have 1200 contacts and that may be fine. Conversely, with depth jumps, 12 may be too many. There is no cut and dried answer. It depends on the individual's goals, training status, and the intensity of the drill. A simple rule is the higher the intensity, the fewer the contacts.

Use an appropriate surface

Too hard a surface can cause impact injuries. A sprung floor, grass, or wrestling mat are all reasonable options.

Creativity: Just understand the principles

Almost any movement can be done in a plyometric fashion. The only limitation is your creativity. See Wall Dribble with Medicine Ball and Forward Hops on a Scooter as examples of less traditional exercises.

Exercises

Push Press

A rapid bending of the hips, knees, and ankles creates a strong eccentric loading of the lower and upper body musculature which elicits the myotatic reflex. The motion is then halted, quickly stretching the connective tissues thus storing elastic energy. Finally, the weight is driven overhead with the aid of these reactions. (See Figures 3 – 5).

Rotational Slams Against a Wall

An example of a multi-planer exercise, rotational slams start with a quick backward rotation of the torso. Then an explosive unwinding hurls the ball forward to the wall. Catch the ball on the fly and repeat. (See Figures 6 – 8).

Medicine Ball Slams

(can progress to One Arm Slams)

The quick raising of the ball overhead and explosive slamming of the ball to the floor can progress from using two hands to using just one. (See Figures 9 – 10).

Half Dome Ball Alternating Push Over-the-Top

With one hand on the floor and one hand on the half dome ball, perform a powerful push-up, skipping over the top to switch hands. (See Figures 12 – 14).

Wall Dribble with Medicine Ball

(shoulder internal rotation)

With the elbow slightly lower than shoulder, cock the arm back then internally rotate the shoulder throwing the ball into the wall. Catch it on the rebound and repeat. (See Figures 15 & 16).

Forward Hops on a Scooter

(can also be done backward or to the side)

In a push-up position with knees (or feet) on a scooter, push up and forward propelling yourself across the floor. (See Figures 17 – 19).

Figures



Figure 1: Push Ups off wall



Figure 2: Push Ups from knees

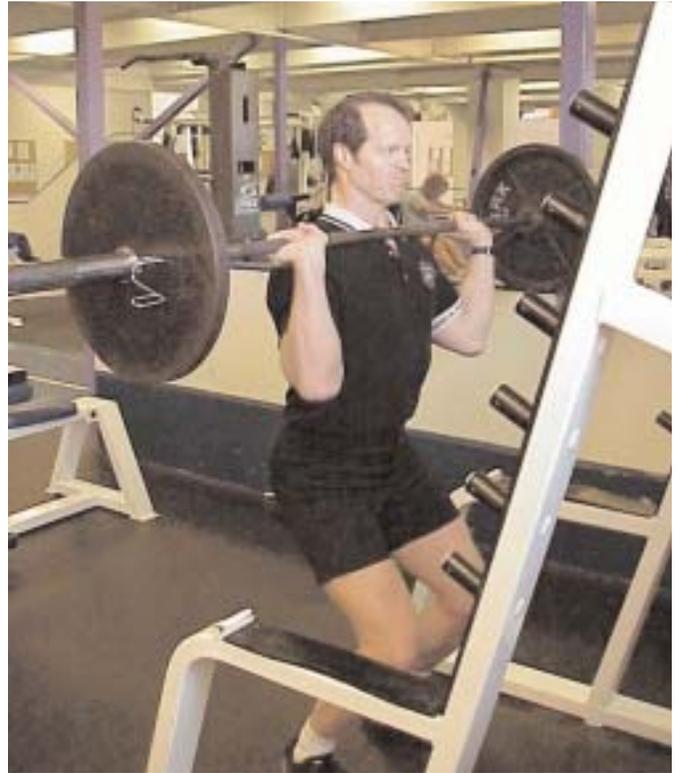


Figure 4: Push Press, bending of hips, knees, and ankles



Figure 3: Push Press, starting position

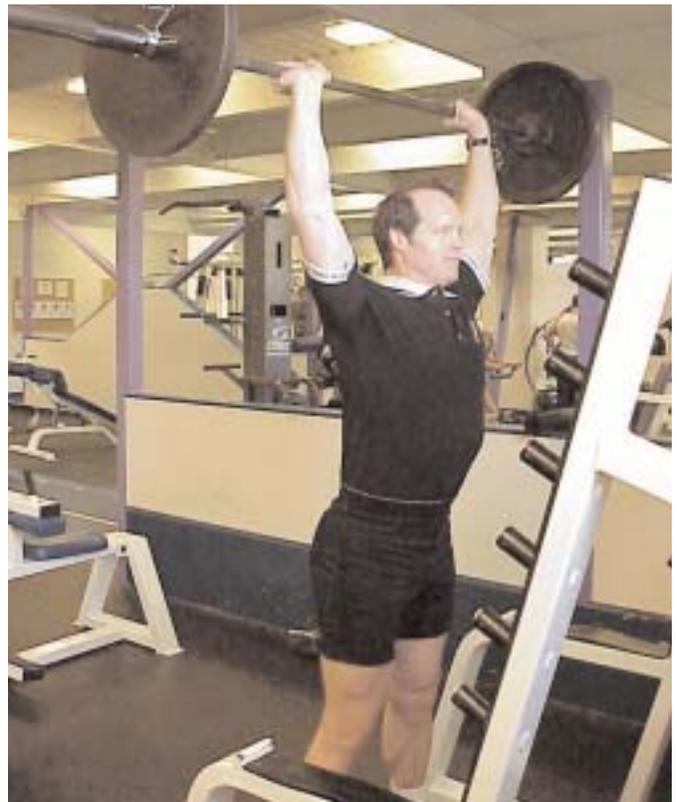


Figure 5: Push Press, finishing position



Figure 6: Rotational Slams, backward rotation



Figure 7: Rotational Slams, explosive unwinding



Figure 8: Rotational Slams, finishing position



Figure 9: Medicine Ball Slams, starting position



Figure 10: Medicine Ball Slams, slamming ball to floor



Figure 11: Medicine Ball Slams, finishing position



Figure 14: Half Dome Ball Alternating Push Over-the-Top, finishing position



Figure 12: Half Dome Ball Alternating Push Over-the-Top, starting position



Figure 15: Wall Dribble with Medicine Ball, starting position



Figure 13: Half Dome Ball Alternating Push Over-the-Top, pushing up



Figure 16: Wall Dribble with Medicine Ball, finishing position



Figure 17: Forward Hops on a Scooter, starting position



Figure 18: Forward Hops on a Scooter, pushing up and forward



Figure 19: Forward Hops on a Scooter, finishing position

About the Author

Mark Nutting, CSCS, NSCA-CPT, is the NSCA Northeast Regional Coordinator and Maine State Director. He is the Co-Owner of Metamorph Fitness, Inc. and is Fitness Director at Saco Sport & Fitness in Saco, ME. He received his BS in Physical Education from University of Maine and has 25 years experience in Personal Training and Health Club Management. Now a Licensed Corporate Wellcoach®, Mark has 10 health/fitness certifications, is a Board of Executives member for the Maine AAHPERD, Liaison to Maine Governor's Council on Physical Fitness, Sport, Health, and Wellness, and Executive Council Member for the NSCA Personal Trainers' Special Interest Group.