

Fit Facts™

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PLYOMETRICS: CONTROLLED IMPACT/MAXIMUM POWER

It may sound like the latest action film, but controlled impact and maximum power are the aims of a training technique called plyometrics.

Also known as jump training, plyometrics involves stretching the muscles prior to contracting them. This type of training, when used safely and effectively, strengthens muscles, increases vertical jump and decreases impact forces on the joints.

Plyometrics mimics the motions we use in sports such as skiing, tennis and basketball. If you enjoy dodging moguls, chasing down ground strokes or charging the net, plyometrics might be an appropriate training option, as these exercises are designed to increase muscular power and explosiveness. Plyometrics is not, however, for those who are in poor condition or have orthopedic limitations.

Olympic Secrets

The Eastern Europeans first used plyometrics in the 1970s to develop greater strength and power in their Olympic athletes. They based their programs on scientific evidence that stretching muscles prior to contracting them elicits the "myotactic" reflex, or stretch reflex, of muscle to enhance the power of contraction.

This pre-stretching of muscles occurs when you perform jumps one after the other. For example, when you land from a jump, the quadriceps muscles at the front of your thighs stretch as your knees bend, and then quickly contract with the next leap. This pre-stretch enhances the power of the second jump.

Proceed With Caution

Plyometric training has received its share of criticism due to reported cases of injury following "plyometric" programs of depth jumping and drop jumping, which involve jumping up to, and down from, boxes or benches that are as high as 42 inches.

The forces sustained from these types of jumps onto hard surfaces can be as much as seven times one's own body weight. However, carefully considering the type of jumps selected for the program, enlisting a coach or trainer for supervision and gradually progressing to more difficult exercises can make a plyometric program both safe and effective.

Jumps should always begin from ground level, off of and onto padded surfaces such as grass or a gym mat over a wood gym floor. These types of jumps are both safe and easy to perform. Other training techniques include jumping over cones or foam barriers, and traveling bounding.

Research has consistently shown that plyometric training can help lead to improvements in vertical jump performance, leg strength, muscle power, acceleration, balance and overall agility.

These factors contribute to reducing an individual's potential risk of injury. In addition, some studies have shown plyometrics to have a positive effect on bone density, especially in younger participants.



Use This Tool Wisely

If you are considering plyometrics, proceed with caution. A sports medicine physician or therapist can advise you on whether this training technique is suitable for you, and may even help you get started or recommend someone who can.

But, if improving athletic performance is not a high priority, the additional risk associated with this activity may not be worth the potential benefits.

You will have a more rewarding training experience if you follow the recommendations outlined above. Use only simple ground-level jumps from soft surfaces, and train under proper supervision. Plyometric training can be a smart addition to a healthy individual's training program, as long as it is used wisely.

Quality, not Quantity

A safe and effective plyometric program stresses the quality, not quantity, of jumps. Safe landing techniques, such as landing from toe to heel from a vertical jump, and using the entire foot as a rocker to dissipate landing forces over a greater surface area, also are important to reduce impact forces.

In addition, visualization cues, such as picturing yourself landing "light as a feather" and "recoiling like a spring" after impact, promote low-impact landings.

When landing, avoid excessive side-to-side motion at the knee. Landing forces can be absorbed through the muscles that help support and protect the knee joint (quadriceps, hamstrings and gastrocnemius) more effectively when the knee is bending primarily in only one plane of motion.

Additional Resources

American College of Sports Medicine Current Comment—Plyometric Training for Children and Adolescents: www.acsm.org/AM/Template.cfm?Section=Current_Comments1&Template=/CM/ContentDisplay.cfm&ContentID=8649

American College of Sports Medicine Current Comment—Explosive Exercise: www.acsm.org/AM/Template.cfm?Section=Current_Comments1&Template=/CM/ContentDisplay.cfm&ContentID=8644

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PHYSICAL EDUCATION

“Plyometrics”

HEALTH-RELATED FITNESS LITERACY ASSIGNMENT

Name: _____

Hour: _____

Directions: After reading the article, answer the 3 close & critical reading questions. The assignment is worth a total of 10 points.

1. Anticipation Guide (Mark the statement true or false, if it is false give word(s) that make it true. (2.5 Points)

1. _____ Plyometrics involves stretching the muscles prior to contracting them.
_____ (Correct Answer)

2. _____ When plyometrics are used safely and effectively, it can help improve vertical jump.
_____ (Correct Answer)

3. _____ Plyometrics are for those who have orthopedic conditions.
_____ (Correct Answer)

4. _____ The Germans first used plyometrics in the 1970's to develop greater strength & power in their Olympic Athletes.
_____ (Correct Answer)

5. _____ A safe & effective plyometrics program stresses quantity over quality jumps.
_____ (Correct Answer)

2. How would you summarize or write a shortened version of this article containing only the main points? (2.5 Points)

3. Explain how you can use the information you have read and apply it to your life to help you improve your health-related fitness. (5 Points)
