

## Plyometrics BY Charlie Bender - CharlieX@ix.netcom.com

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Q1: What are plyometrics?

A: Plyometrics are any exercise where the muscle is contracted eccentrically then immediately, concentrically. In plain English, the muscle is stretched (i.e. loaded) before it is contracted. A good example is push-ups with a clap in-between each push-up. Your muscle (pectorals in this case) is elongated and loaded by the downward force of your body, then immediately you must contract the muscle to push yourself back up.

Q2: Why do I care?

A: Because plyometrics is one of the best ways, if not the best way, to improve power. To justify this answer lets first look at what is power. Power is similar to strength except you are adding the time factor. Therefore the relation of strength and speed is what we are talking about when we talk about power. A person who can perform a specific resistance movement, such as jumping, bench press etc., and the fastest would be said to have more power in that movement. So what we are looking at is not just the contraction of the muscle, but how fast will it contract. It has been shown that a muscle will contract the fastest when it has been loaded. This is why you should be able to jump higher if you crouch down then immediately jump up than if you started in the crouch. So if this is the best way to perform a powerful movement lets practice these movements. This practice is called plyometrics and has been shown in study after study to decrease the time it takes for the muscles to contract, resulting in more power.

Q3: What are good plyometric exercises for increasing vertical jump?

A: There are an infinite number of plyometric exercises to increase vertical leap but here are a few good ones.

Two foot ankle hop (low intensity) - keeping your feet together and remaining in one place hop up and down using only your ankles and calves. Concentrate on getting as high as you can and exploding off the ground as soon as you land.

Rim Jumps (medium intensity) - Stand under a basketball rim. Jump up touching the rim (or net or whatever) with alternate hands. Concentrate on getting as high as you can and exploding off the ground as soon as you land.

Box to Box jumps - (high intensity) - Place two boxes that will support your weight about 3 feet apart. Standing on one box step (NOT JUMP) off to the ground and immediately jump back up to the other box. Turn around and repeat. Obviously the difficulty of this exercise is increased as the heights of the boxes are increased. Once again concentrate on getting as high as you can and exploding off the ground as soon as you land (notice a pattern here?)

In all the above exercises you are using your body weight and gravity to load the muscle before contraction. The forces you generate are much larger than could be safely accomplished using conventional resistance (read weights) exercises. It is true these forces only exist for a brief amount of time, but they still stress the muscle, which is the point.

Also these exercises can be combined. For example try jumping off a box before jumping up to the rim.

Q4: What are good plyometric exercises for increasing speed

A: While all of the above exercises will also increase your speed (leg speed), these are many others that just focus more on movement. Here are some examples

Zig Zags (medium intensity) run an elastic cord about a foot off the ground. While on one-foot hop back and forth over the rope. Repeat with other foot.

Side to side ankle hops - Same as regular ankle hops (see above) but instead of remaining in place you jump 2 to 3 feet side to side.

Sprints. Yes sprints are plyometrics since the force of your body coming down loads the hamstring.

Q5: Do strength shoes work? Where do I get them? How much do they cost? Are there alternatives? Why are strength shoes included in a plyometrics FAQ

A: Yes strength shoes do work, they make every step a plyometric exercise for the calf. Since they only work the calf though you must do regular plyometric exercised in them to work the other muscles. They do come with a excellent plyometric regime and a nice video. For those of you who don't know what a strength shoe is: It is a shoe with an elevated sole, but the sole is only on the ball of the foot. The calf is allowed to hang free forcing it to be stretched (thus loaded) on every step. Be aware that the calf plays a limited role in jumping and acceleration, approximately 30%, so while strength shoes will help they are no magic pill and are just a tool for a good plyometric regime. Strength shoes are available for about \$140.00 at (800) 451-JUMP. You can also get the strap on equivalent that turn any shoes into strength shoes from Metapro at (415) 967-4787 for around \$55.00

Q6: What is a good book on plyometrics and where can I get it.

A: The best book on plyometrics is Jumping Into Plyometrics by DonaldA. Chu. It is \$13.95 and available at Borders and Barnes and Noble. I think you can also get it from Spike-Nashbar at (800) SPIKE-IT. The ISBN number is 0-88011-433-6 . It has a great many exercises and good tips about how to put together a program. Also each exercise is cross-referenced by what sport it helps. All in all, a good book.

Q7: Are plyometrics dangerous?

A: Since so many exercises could be considered plyometrics, of course some of them are dangerous. Jump squats are a great example. This is where you perform a regular squat (with weight) and actually jump at the top of the motion coming off the ground 1-2 inches. You perform this exercise with about 1/3rd of your max. weight. This is one of the best exercises to increase your jumping ability. Unfortunately it is also a dangerous one. If you don't have great form, and you can't do at least 50 reps of regular squats at the weight don't even think about them. Also stay away if you have a bad back or knees. On the other hand the two-foot ankle hop is very safe, and will offer good benefits. A good general test to see if you are ready for plyometrics is to stand and jump up as high as you can. Measure this height (chalk on your fingertips and a clean wall is a good way to measure). Then jump off an 18-inch box and jump as high as you can. If you can't reach as high as you could on the ground you would be better off hitting the weights and coming back later.

Q8: Random thoughts

While plyometrics will increase your vertical jump, form has quite a bit to do also. Try to crouch to a point where your knees reach a 90-degree angle. A good arm swing will easily add inches. By throwing your arms up as you jump you are decreasing the weight that you have to push off the ground and the inertia of your arms going up will help pull the rest of your body up. Also the faster you are moving before the jump, the higher you can jump. You can transfer this horizontal speed to vertical speed with the proper form. This is why high jumpers get a running start to jump much higher than they could standing still.