

THE ORIGINAL ‘SHOCK METHOD’ TRAINING:

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Ask a coach how to jump higher and you’ll most likely get this answer: Do more plyometrics training. How to be more powerful? Do more plyometric training. How to have a quicker first-step or better acceleration? Do more plyometric training. How to be more explosive than other athletes toward the end of your game? Do more plyometric training.

Is that true? Well, yes, and no.

Yes, plyometric training, when implemented properly into a safe and effective strength and conditioning program can help you jump higher, help you be more powerful, help you improve your first-step quickness and acceleration, and help you be better conditioned to be explosive, even at the end of your game.

And, No, if you do not have the proper foundation or do not understand the proper sequencing, various types, and proper selection of plyometric training exercises, you will not see the results you will expect.

The key to maximizing the potential benefits of plyometric training is understanding what exactly plyometric training is (vs. plyometric actions), what the different training exercises are, and when to use them. (To further illustrate these points, I am using two excellent references for sports performance coaches: 1. Supertraining, by Dr. Mel C Siff and Dr. Yuri Verkhoshansky, and 2. Facts and Fallacies of Fitness by Dr. Mel C Siff)

Powermetrics

The plyometric training method was pioneered well over 40 years ago by Professor Yuri Verkhoshansky, formerly of the State Central Institute of Sports Science in Moscow. Professor Verkhoshansky called this method “shock training” and over the years it has been erroneously translated as plyometrics or pliometrics in the Western world. A more suitable and suggested name for this training is powermetrics, to help coaches distinguish between plyometric training methods and plyometric actions. Plyometric actions are naturally occurring in movements such as running and jumping and other ballistic movements. The Plyometric training method (powermetrics) is a discrete training system devised to develop speed-strength in athletes. Plyometric actions are simply stretch shortening actions, such as running, jumping, hurdling, striking, and other rebounding movements in sport, and plyometric training (powermetrics) is a specific training method of applying mechanical shock force (hence shock method) to force the muscle to produce as much tension as possible (store elastic energy).

A well known form of lower body plyometric training is depth jumps (a relaxed drop from a specific height onto the ground followed by an explosive rebound). A well known form of upper body plyometric training is the rapid rebound throwing of a medicine ball off a wall, between two athletes, or off a mini-trampoline.

To prevent any further confusion in this article, the plyometric training method will be called powermetrics henceforth.

Powermetric Methods

There are several different classes of powermetric training methods, including, but not limited to, impact, non-impact, maximal, and submaximal. I will not go into detail about each in this article, however, if you’re interested, just let me know and I’d be more than delighted to carry on this discussion.

I will, however, mention that in addition to exercise selection, sequencing will have a huge impact on the result it will get from training with a specific powermetric exercise. For example, a maximal depth jump, done in the beginning of a workout, will elicit maximal jumping abilities (max power) while the nervous system fatigue is non-existent or minimal. If the same movement is done at the end of the workout, it will now be primarily used for power endurance purposes, or teaching the athlete to maximally contract or use stored elastic energy in a fatigued state. Please note that any advanced powermetric exercise must first be learned during a non-fatigued state to ensure the safety of the athlete. However, a powermetric sequence using simple plyometric actions or sub-maximal powermetrics, which are much less likely to result in any injury, can be introduced with very low repetitions (3-8) at the end of a workout.

Max Power

Another very effective way to use powermetrics for max power is to incorporate complex or contrast methods into the workout. An example of a complex/contrast sequence would be performing a set of barbell back squats then immediately performing a set of maximal depth jumps. Another example would be doing a set of weighted squat jumps (10% 1RM) and then immediately doing bodyweight squat jumps (3-6 repetitions). In both of these methods, the nervous system is prepared for more “resisted repetitions” and is ready for maximal muscle fiber recruitment and/or quicker rate of force development. When the second exercise is performed and no external resistance is used, the end result is the body exerting force as if the external resistance was being used—resulting in greater maximal force output and/or a faster rate of muscle contraction: hence a higher jump. The goals of powermetric training are to produce a greater maximal force output or quicker rate of force development (from the time the foot touches the ground to the time the muscles contract to perform the desired action).

Power = Strength x Speed

To achieve maximum power, there needs to be increases in strength and speed. An athlete can see gains with increases in only one of the two, but to see the best results, the focus of training should be on improving both elements. Strength is the application of force, and speed is the rate at which an athlete is able to apply that force. Once an athlete has a proper strength and speed (general fitness) foundation, then powermetric training methods can be used to maximize the strength and speed output for power bursts.

Power Endurance

Performing a sequence or series of powermetric exercises at the end of a workout will help produce greater results with power endurance. Many sports rely heavily on the best athletes being conditioned to perform explosively throughout the entire game. Being explosive for the first 5 minutes of a game is only important if the game is only 5 minutes. An athlete must be trained to for both max power output and also power endurance (the ability to sustain that power during the entire competitive event). Powermetric exercises utilized at the end of a workout should begin with low reps, no external resistance, and focus on perfect technique. As the athlete is able to maintain perfect technique in a fatigued state, the reps can be increased, exercises can be added, or light external resistance may be added.

Training Considerations

Aerobic conditioning can interfere with an athlete’s ability to train for power and power endurance. How many marathon runners have a vertical jump of over 30””? I’m sure you don’t have to think about that one too much. There are better ways to get specifically conditioned for your sport without risking the loss of power or power endurance. (If you have questions about your current training program, please call me, email me, or stop in). I will save them for another article.

[How to benefit from powermetrics: \(page 221, Facts and Fallacies Fitness, 6th edition\)](#)

1. Powermetrics are really intended for specific sports preparation and must be taught by very experienced coaches on a basis of sufficient strength and reactive ability.
2. Powermetrics strongly excite the nervous system and can interfere with workouts several days later.
3. Depth jumping involves falling in a relaxed state, but not jumping, off a box.
4. No more than about 2-3 sets of 5-8 depth jumps should be done by the average athlete per session once or twice a week, properly integrated into a long-term strength training program.
5. A useful initial drill is hopping or skipping on the spot at a comfortable frequency for a few sets of 25 repetitions and then progressing to hops performed as rapidly as possible.
6. One must develop adequate jumping skills and eccentric strength with weights before commencing maximal powermetrics.
7. Head posture and direction of gaze are important in controlling all aspects of depth jumping.
8. Quality is far more important than quantity of powermetric movements.

Final Thoughts

So, the bottom line here is that powermetric training methods, when used correctly, are very beneficial to power athletes. It is important to know when to include them into your program, how to progress them, and how to select the best exercises for you and your sport(s). If you need help with this, please seek the advice of a qualified, experienced, and certified strength and conditioning professional.

Side Note: As an example of the complexity of the powermetric training method, I wanted to leave you with a tip for training using depth jumps. If the duration of a pause on an eccentric or landing movement before performing a concentric or jumping movement is longer than .25sec., then most of the stored elastic energy from the eccentric movement is lost. Therefore, this training exercise is not effective at training for powermetric improvement.