

Program Design – Power Endurance

By Chris White

The goal of any power endurance program should be to increase overall work capacity. That is, more work accomplished in a given amount of time. For example, if an individual completes 90 squats in two minutes and one week later completes 100 squats in the same two minutes a theoretical improvement in work capacity was achieved, all other factors being equal. Stated another way, if it takes two minutes to complete 100 squats and one week later it only takes 1:30 to complete the same 100 squats, this too would be an improvement in work capacity or power endurance.

There are several methods of training power endurance. While all of the factors involved are beyond the scope of this article, three main things should be considered:

- 1.) **Duration** – The duration of the movement or series of movements can be short, intermediate, or long. Short power endurance is less than 4 minutes. Intermediate can be anywhere from 4-30 minutes. And long 30+ minutes. Duration is based on the individual's given work or sport environment or, if overall fitness is the objective, their largest bio-motor deficiency.
- 2.) **Exercise Prescription** – Multi-joint, oxygen-demanding movements are a must. Exercises like front squats, push presses, dead lifts, kettle bell swings, and rowing are good choices because they are total body movements. The more muscles involved the higher the oxygen demand. The higher the oxygen demand the more efficient the system has to be at delivering that oxygen in an effort to sustain performance.
- 3.) **Rest Periods** – Short rest periods are typical of endurance-based programs. Keep in mind there is an inverse relationship between rest periods and intensity (see chart below). Short rest periods impede recovery and therefore detract from load sustainability (intensity). Longer rest periods allow for longer bouts of recovery and better load sustainability. So, if the emphasis is more strength or pure power, longer rest periods are more appropriate. However, if the emphasis is on long power endurance (30+ minutes), shorter rest periods are more appropriate. Either way, the general rule of thumb is to keep the rest periods short to force the cardiovascular and respiratory systems to adapt to the overload.

Below is an example of how a program can be manipulated to emphasize either more strength / power or more endurance.

Power Endurance - Strength / Power Emphasis:

5x Barbell Front Squats @ 85% +
10x Kettle bell Swings @ 70# +
5x Box Jumps @ 36"

3 sets, rest 3 minutes between each set

Because there is plenty of rest allowed between each set more weight can theoretically be used for each movement. If the rest period was shorter, say one minute, a true 5RM could not be used, because more than likely the trainee would not be able to sustain that level of intensity due to the inability to recover fully between bouts.

The same is true for the box jumps. Three minutes of rest allows for a higher box to be used. Shorter rest makes a lower box more appropriate.



LOW INTENSITY

HIGH INTENSITY



SHORT REST PERIOD

LONG REST PERIOD

*Remember that intensity is a product of %1RM. Just because a program is hard doesn't make it, by definition, intense.

Power Endurance - Endurance Emphasis:

10x Barbell Front Squats @ 50% +
10x Kettle bell Swings @ 70# +
15x Box Jump @ 24"

3 rounds for time

The word 'round' indicates there is no rest and that the movements must be completed for the prescribed number of rounds as quickly as possible. Any rest taken gets built into the total time it takes to complete 3 rounds. With no rest loads must invariably be lower. Even a true 10RM, roughly 75% 1RM, is unlikely with such little rest.

Conclusion

All programs must be outcome-based. Taking the time to write a plan that is appropriate for your clients / athletes is quite necessary. To the layman much of what we do may seem random when viewed on a white board or on the Internet. But designing programs that challenge clients at an appropriate level, are creative, and aren't 'too much' is an art form that takes years and years of experimenting, testing, failing, success, and more failing.

Sample Power Endurance Programs (warm-ups and cool downs are not included)

Program #1

Block A

5/5x Barbell Box Step-ups @ 16" (do not push off back leg) +
10x Overhead Kettle bell Swings +
8/8x Box Step-up Jumps @ 24"
3 sets, rest plenty

Block B

5x L-sit rope climbs

Program #2

Block A

2000M Row for time: _____

Block B

1-10 Ladder:
Ball Slams +
Ring Push-ups
Time: _____

Block C

100x Burpees (full push-up, clap at the top)

Program #3

Block A

Work up to 1RM Power Clean 1RM: _____

Block B

As many Power Cleans @ 90% 1RM as possible in 15 minutes
Repetitions: _____