

The Bioenergetics of Strength Training for Basketball

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When bioenergetics is discussed for sport-specific training, most of the discussion revolves around movement training, such as plyometrics; conditioning; and skill work performed on the field or court. However, very rarely do these streams of thought cross over into the strength-training realm. More often than not, strength-training programs are designed with specific strength goals in mind rather than specific sports goals. Even at the lower collegiate levels, many programs are written to produce stronger athletes with the hope that stronger athletes will produce better sportsmen. While strength is *a* determining factor in an athlete's success on the court or field, it is hardly *the only* determining factor. So the question becomes, as it has been for decades, how to get the greatest possible transfer between what is achieved in the weight room to what is accomplished on the field or court during competition.

One solution is to train in the weight room according to the bioenergetics of the specific sport. For the purpose of this article, basketball will be discussed, but the concepts can be applied to any sport so long as you match the bioenergetics criteria.

The bioenergetics of basketball involve heavily upon the phosphagen system as well as glycolysis. Basketball is a game of short, maximum-intensity movements mixed with longer bouts of running and lateral movements. Due to the nature of the game, there is rarely a time where the game is in action for longer than two minutes without a stoppage in play, with stoppages happening as frequent as every few seconds, as well. Also, substitutions happen fairly frequently. Because of these factors, the oxidative system does not play a tremendous role in basketball conditioning, despite the beliefs of most coaches today. Furthermore, the oxidative system will be taxed to meet most players' needs in practice and during extended bouts of off-season pick-up games, such that it does not warrant the use of precious time being trained in the weight room.

Now, breaking down the game a little more, it can be seen that most sequences in the defensive half court are comprised of sub-maximal to near-maximal movement for upwards of 35 seconds, followed by a near-maximal (depending on the position) isometric of 3 to 5 seconds, finishing with an explosive maximal movement lasting less than a second. Of course, if the rebound is not secured, the process can immediately start all over again. There also may be repeated attempts of maximal explosion in a very short time frame if players are having trouble timing out the rebound.

On the offensive side of things, the game is usually played with more sudden bursts of speed and quickness in between bouts of waiting for a screen or moving slower to set the defense up. There is also that all-out maximal effort when the shot goes up. This usually lasts for upwards of 35 seconds, depending if there is a shot clock or not.

One of the ways these sequences can be trained in the weight room is through circuit training, with circuits consisting of sets for time rather than for reps. An extended isometric contraction can be added in at the end of every set, as well, along with an explosive movement. For example, a circuit could be set up consisting of body weight squats, push-ups, pull-ups, and reverse lunges in place, with each exercise being done for 30 seconds. At the end of the 30 seconds, athletes would hold their position for an additional 5 seconds, followed by an explosive push, pull, or jump.

I would implement these types of circuits in the early fall of a training program, assuming a mid-October or early November start date for practice. These circuits would follow the heavy core lift for the day—squats, bench press, deadlift, etc. Up until that point, I would have the focus in the weight room on putting on size, if needed, as well as getting players stronger with more traditional lifts and other types of body weight circuits. I would dedicate the majority of the off-season strength-training program to these goals so athletes have a sufficient strength base to get through the season, when strength training is usually much more limited.

Another way to achieve these sequences that would be more appropriate for the earlier part of the off-season would be to add in weighted isometrics into the training program. Examples of this would be a dumbbell bench press for reps and, at the end of the set, having the athlete hold the dumbbells just off of his or her chest for up to five seconds. These exercises are safest to perform with dumbbells, although barbells can be used if the spotting is sufficient enough and the athletes feel comfortable doing so.

When it comes to training basketball players, you have to remember that, first and foremost, they are athletes, so you need to train them as such. Once they master the basic moves of athleticism—linear and lateral acceleration and deceleration, jumping and landing, proper running mechanics, basic strength, etc.—you can begin to build them up in a more basketball-specific manner. While the weight room is a tool to enhance movement, prevent injuries, and improve strength, it can also be used to train the bioenergetics of the sport.

Get big or die tryin’.

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