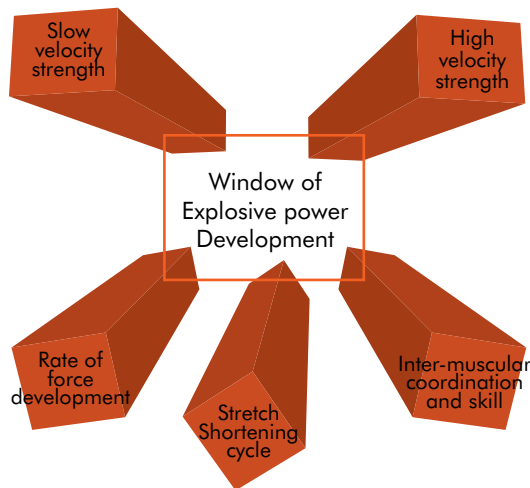


# 5 keys to explosive power development

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Why does the same exercise prescription create different adaptations in different athletes? Why is it that if an athlete were to copy a training routine of an elite athlete it will not create the same adaptation for him/her as what it did for the elite athlete?

The secret is that one should only use the general underlying fundamentals of these elite programmes but adapt and apply it to suit each specific individual. Not all athletes have the same physical development of the components highlighted below and therefore also one of the reasons it is ideal to train various components throughout the training year as explained in the Window of explosive power development.



Adapted from Mcardle, Katch & Katch. Fig 22.17, p 526

The figure above list the 5 components necessary for the development of power.

This basically means that if your athlete's weakest component is slow velocity strength you will get the biggest improvement by focusing on this component. To understand each component better the following examples of exercises that matches each component, is listed below;

- 1 Slow velocity strength = Very Heavy Squats
- 2 High velocity strength = Snatch (pulling the bar from the floor at high speed to a overhead position)
- 3 Rate of force development = Speed squats (Doing a squat at 50%-60% of your MAX as fast as possible )
- 4 Stretch shortening cycle = Jumping
- 5 Inter and Intra-muscular co-ordination skill = This done during the teaching of techniques of lifts like doing drills of the exercises and focussing on getting the neuromuscular system to activate more muscle groups and muscle fibres to activate.

The margin of adaptation gets bigger the weaker the component is that you are working on and the margin decreases the more developed the component is. The reason for this is that if you are already well conditioned in slow velocity strength you will be close to your peak in that component and only small improvements will occur in your overall performance. These 5 components will differ from one person to another because of their genetic make up, level of conditioning, previous training programs and the sport they compete in.

This is the reason why all these components should be trained throughout the season for athletes requiring explosive power in their sport. Explosive power is developed optimally by training all 5 components and if 1 of these de-trains it will have a detrimental effect to the athlete's explosive power development. For example if you become significantly weaker in slow velocity strength it may cause you to have a decrease in explosive power.

The training modality that addresses almost all 5 of these components is Weight lifting or Olympic lifts. To appreciate the significant adaptation you can achieve with Olympic style weight lifting exercises, one first has to understand how the body works when creating a specific movement. In simple terms in means that most sporting activities require the body to move as a unit combining

a multitude of different movements in one movement action. An example of a basic movement could be analysing a person standing up from a seated position. This movement requires hip extension, back extension, knee extension, ankle flexion and extension and if you are pushing up with your arms together with your legs also elbow extension, wrist flexion and extension, shoulder flexion and humeral adduction.

In order for you to stand up from a chair, all of these actions have to occur in a specific sequence; therefore muscles have to contract in a specific sequence in order for you to stand up. If a specific part does not occur or occurs in the wrong sequence you will either not be able to stand or stand up in a very inefficient way. So if you look at movement in this manner you can understand that sport movements is more complex than simply standing up from a seated position.

In observing the mechanics of human movement one has to structure and choose exercises that will strengthen the mechanics for the sports that you are preparing for. The best way to achieve this is obviously to practice the specific sport movement itself. By limiting your preparation to only the sport specific training, your performance improvement will also be ultimately limited. Improvement beyond sport specific training as well as injury prevention will require you to condition your body through progressive overload. This will result in positive adaptation eventually leading to increased balance, strength, power, endurance, speed and agility thus most likely improved performance.

It is important to note the value that Olympic style lifts can add to a strength and conditioning programme in addition to being able to comprehend the different mechanics involved in these lifts and how it teaches the athletes body to sequentially act and perform as a

unit. Weight lifting is a total body exercise and is performed in an explosive manner therefore correct technique is of utmost importance. It is only in exceptional and very rare instances that these lifts are contra indicated for anyone engaged in resistance training.

In the attempt to improve an athlete's performance strength for sports that require speed, acceleration and explosiveness, the necessity will arise to increase the individual's rate of power production. The most effective way of achieving the rate of increased power production is by using explosive weight lifting as part of your strength and conditioning programme.

If you take all the different types of athletes and pit them against each other in a 30m dash, which athletes will perform? Quite a surprisingly ... the winners would most likely be Olympic weight lifters followed by the throwers in athletics. These athletes regularly achieve the highest vertical jump test heights because of the explosive nature of their exercises and events.

Due to the nature of their lifts they train all 5 of the fundamental components all the time. Keeping this in mind you can also do jumping and slow velocity exercises to complement power together with weight lifting.

Remember that when it comes to improving physical performance it works on a use it or lose it basis.... which means if you are not actively stimulating one of the 5 fundamental components you will most likely lose the benefit of that particular component!

