

## Developing Explosiveness

By Brock Leggins

At their most basic level, nearly all sports require that force is displayed quickly – in other words, they demand power! However, the methods often espoused by others include methods that are too advanced for many athletes (true plyometric movements such as depth and drop jumps), or methods that are better for developing conditioning (endless series of jumping or running, circuit training, high-rep sets of Olympic lifts, etc.). As with everything, the needs of the athlete must first be considered. However, beyond that, here is a basic progression to use for improving the explosive abilities of athletes.

### Part 1: The Stop

There are many methods for improving power and explosiveness including the Olympic lifts, the dynamic effort method with other barbell lifts, med ball throws, and others, but the simplest and best way for beginners and intermediates are jumping and sprinting. These means can be done nearly anywhere, as you don't need anything more than body weight. Jumping can be done onto a box or bench or something else to jump to, but can also be done simply jumping straight up. And to sprint, all you need is an open stretch where you won't run into anything.

With all that in mind, why is part 1 the stop? This is because the stopping (or landing, in jumping) is actually the most important part due to the fact that this is when most injuries occur. I believe it was Al Vermeil that has stated, "if you're going to teach them to sprint, you better teach them to stop. If you're going to teach them to jump, you better teach them to land." Landing and slowing down are going to be the times when the vast majority of injury is going to occur. However, everyone starts out by teaching athletes how to jump or sprint with perhaps a few words on how to stop properly. In addition to reducing injury, stopping and landing properly will also put you in optimal position to jump, cut, or move.

The 3 most common mistakes I see with landings in particular are landing with the weight either too far forward or too far back, landing straight up and down, or landing with the knees going into valgus (caving in). All three increase the risk of injury as well as leaving you in a poor position to jump again or make another move. How to fix these issues:

1. Weight too far forward or too far back – athletes tend to either flat-footed, or over-correct by landing on their toes with their heels in the air. Landing should be mostly mid-foot, ending in a solid athletic position, with weight shifted forward, and heels only slightly off the floor. A good rule of thumb is to be able to swipe a credit card under their heel.
2. Landing straight up and down – you should be landing with the knees and hips bending and absorbing the force as you land. Keep in mind to try to land as quietly as possible. This also tends to fix the issue of landing flat-footed.
3. Knees caving in – just as with squatting, the knees should not cave in. Focus on keeping the knees in line with the toes, and landing position should look very similar to take-off.

As with most athletic endeavors, teaching an athlete to slow down will first and foremost involve getting them to drop their hips. Far too many athletes are simply so weak that they move and run nearly straight up and down. As you may have guessed, slowing down or stopping while running nearly straight up and down is not going to end well (most likely, they will faceplant, if they don't hyperextend a knee first). As they approach their stopping point, get them to lower their hips, and they should end up in basically a "split" athletic position (knees and hips bent, back flat, with one foot in front of the other). It will take some athletes a considerable amount of time to get it down, but as usual, if you are taking the long-run approach to training athletes, then this is not an issue. Take the time to get it right, and watch the results come down the road!

### Part 2: The Sprint (or Jump)

In addition to simple sprinting, there are many kinds of jumps you can do, including simply jumping straight up, vertical jumps, broad jumps, box jumps, tuck jumps and even single leg

jumps or hops (although you should work on single-leg landings and make sure the athlete possesses an adequate strength base before moving on to those).

If you don't have access to much equipment, perform vertical or broad jumps. Simply try to jump as high or as far as you can, and practice perfect landings every time. If you do have boxes or other objects around, you can jump up onto boxes. However, it may be best to just start with vertical jumps. I once attended a seminar where Shawn Myszka presented. Shawn is the co-founder of Explosive Edge Athletics in the Twin Cities, and has really focused much of his study on plyometrics and jump training. He noted that he is not much of a fan of box jumps because often times athletes don't get full extension on their jumps, due to pulling their feet up to get onto the box. I think that is definitely a valid criticism, although with a lot of coaching, and proper progression I don't think it is quite as much of a problem.

To do tuck jumps, jump straight up, then pull your knees to your chest, and land on your feet again. The problem with these is just as with box jumps. People are generally so worried about getting their knees up that they don't commit to the jump, so these are a bit more advanced. True sprint training is a bit simpler, in that you may not need to reinforce quite as much technique. You can certainly try to ingrain good sprint mechanics, however, you must remember that, depending on the age of the athlete, they have already been running a certain way for a number of years. This means that it will take THOUSANDS of repetitions to truly ingrain new sprint technique. As Barry Ross notes, "you can run pretty or you can run fast." In team sport athletes, they simply will not reach top speed very often. As such, simply sprinting is going to be more beneficial than placing a lot of emphasis on perfect technique. The greatest note I would make is focusing time and attention on decent acceleration mechanics – good forward body lean, shoulders, hips, and ankles in a straight line, and feet landing under the body (not in front), will yield better "sport-specific" results than focusing on top-end sprint mechanics.

One final note I would make is that medicine ball throws make a fantastic addition to your program as well. They are very simple to teach and learn, and as long as you have space, you can do a variety of them. Start light!

### Part 3: Dynamic Effort, Olympic Lifting, Plyometrics, etc.

Most of this article has been dedicated to using jump and sprint training to improve explosiveness. The final part will discuss plyometric training (a higher-intensity form of jumping) and touch just a little bit on things like the dynamic effort method and the Olympic lifts.

Plyometric training involves a brief, powerful pre-stretching of the muscles to be used, which is followed by a fast, powerful contraction. The pre-stretch stores energy to be used for the following contraction, as well as using various reflexes in order to produce a more powerful contraction than if there was no pre-stretch used. In terms of jumping plyometrics, things like depth jumps or rebound jumps rely on the pre-stretch supplied by dropping off of a box or other object. Contrary to popular belief, not all jumping is plyometric. Many coaches use box jumps (which I discussed earlier) for "plyos," however, a simple box jump is not actually plyometric in nature, because there is no pre-stretch.

Single-leg plyometrics can also be used, in the form of single-leg versions of depth jumps and rebound jumps, or movements like bounding and sprinting. Any type of running actually involves a plyometric action, but due to the ground contact time, the explosive benefits gained from it is practically nil (unless you're sprinting). Sprinting itself is plyometric in nature and serves that purpose well.

While plyometrics are fantastic for improving reactive ability and rate of force production, it is important to use them wisely. A good rule of thumb is that athletes should not begin performing lower-body plyometrics until they can squat at least 1.5 times their bodyweight, and no upper-body plyometrics until they can bench at least body weight (or possibly a little more). Plyometrics, due to their high intensity, are very stressful on the joints, and if the athlete does not have the

strength and training history to support it, injury is inevitable. Additionally, if they are not landing or jumping with good mechanics, the chance of injury again goes through the roof. Another key is to use them for power production, NOT conditioning! I've heard many horror stories of high school coaches having kids do a minute straight of box jumps or rebound jumps and then not knowing why they had so many shin splints? Yet another reason why high schoolers need the best coaches. Teach them right from the beginning, then they don't need to be "fixed" later on.

While the majority of this article has been spent on jumping and sprinting for training explosiveness, I will give just a short overview of some other methods, namely the dynamic effort method and the Olympic lifts. The dynamic effort method entails using a weight that is roughly 30-70% of your 1 rep max, and performing the reps explosively. While there isn't a hard and fast rule for number of reps, it is best to keep them low (5 or below), as the byproducts of the lactic acid system are likely to start accumulating after that, which will impair power production. For training purposes, the Olympic lifts can include the competitions lifts - snatch (from the floor to overhead in one movement), and the clean and jerk (floor to the shoulders, shoulders to overhead) – and any or all of their variations. The beauty of the Olympic lifts is they cannot be performed slowly. Try picking a bar up from the floor and putting it overhead slowly. Chances are you won't be successful with any amount of appreciable weight. While they do take some time to master, find yourself a good coach and you can get started on them today.

While this article has been far more brief than it could have been, it should outline some very basic ideas related to the development of explosiveness for nearly all athletes. As always – align the method with the level of the athlete!