

## Strength Training

Our goal for conditioning is to prepare our bodies to do the unusual and unique movements that separates dance from pedestrian movement. There are three principles that need to be addressed in our strength training for dancers to maximize your efforts. The three principles are overload, specificity and reversibility. We'll start with the principle of overload.

The overload principle states that strength of a muscle cannot be increased unless the muscles are stressed or worked beyond their normal workload. You can do this in a variety of ways. You can increase the frequency of the exercise program, the duration, or the intensity. Let's say you want to strengthen your ability to jump. You might do single leg relevés, a set of 10, 3 times a day (increasing the frequency by increasing the times you repeat it during the day). You could do one set, working your way up to more reps (allowing the fatigue of the calf muscles to determine how many you do — increasing the duration). You could also do a set of relevés, and then take that into jumping (increasing the intensity).

The principle of specificity states that the way you strengthen a muscle group should be as similar as possible to the dance movements you do in class or on stage. The example that I use most often for specificity training is abdominal exercises. Most dancers and athletes know how to do 'crunches' — which do strengthen the abdominal muscles, but not in the same coordination that they would be used for standing up straight, or keeping the torso tall and long while doing a developpe', for example. The abdominal muscles in a crunch are doing an concentric contraction which means the length between the ends of the muscle are shortening, while the abdominals work more generally in an eccentric and isometric contractions when you are standing and walking. (Isometric contraction means the length of the muscle stays the same, eccentric contraction means the muscle lengthens as it contracts) I will address abdominals in a future newsletter, as there are so many misconceptions about how they work and how to train them.

The last principle, reversibility, describes the loss of strength that happens when you stop training. This loss of strength can occur rapidly unless there is some other form of cross training to take its place. Generally speaking, a muscle needs to be conditioned at least two times a week in order to maintain its level of strength. What does this mean in practical terms? A common example would be the dancers that take the summer off from dance classes. They are going to have a longer time getting

back in shape come fall than someone who danced even occasionally or twice a week, during the summer. If they didn't dance, but worked out at the gym on a regular basis, focusing on their overall health, combining cardiovascular with weight training, they will have a far easier time coming back into classes in the fall as their general muscle tone will have been maintained but without the specificity of dance movement. ( do encourage dancers to cross train for optimal health.)

There are two factors that influence the strength of a muscle. The first is the size of the muscle and the second is the nervous system's ability to control the muscle. Each muscle has many muscle fibers — often up into the hundreds of thousands. When these fibers receive a message or signal from the nervous system they contract, or shorten. If the movement requires little strength, then fewer fibers will be directed to contract. As more strength is required, then more muscle fibers are called into action. Through strength training the nervous system is learning to better coordinate the contraction of muscle fibers — this increases their strength without increasing their size. It will do this naturally when the body is in good anatomical alignment — AND — the dancer is not overworking their musculature. What do I mean by that? I often see dancers standing in first position, with their gluteals contracted and tucked under, their quadriceps contracted to 'pull up' their knees, their arches 'lifted', shoulders 'pulled back', necks 'lifted'. Get the picture? They have incredible muscle contraction going on and they aren't even moving! Now when they try to move from that posture they are going to have to work even harder, which has the potential to create muscle strain.... Or disengage from all the holding and re-engage to move. Very inefficient muscle usage, although it does make you 'feel' that you are working very hard.

Before I get sidetracked into talking about the myth of no pain no gain let's get back to muscles and conditioning. A well-toned muscle is one that is strong and flexible. An example of this is that the hip flexors need to be strong to lift the leg up into a battement front, but also needs to be flexible to help lengthen into an arabesque.

There are times that cross training is a very good way to help a muscle develop the strength it needs for specific dance movements. For example, if you are trying to develop more strength for developpes, doing some typical knee extensions or leg lifts would give the quads a better foundation of strength. The leg lifts would increase the frequency of repetition, and if you put a weight on your leg while doing knee extension, it would increase the intensity of the exercise. Then you can get back

to specificity and practice your developpes while lying on your back, to keep your pelvis and torso aligned, before returning to try them in the standing position.

Sometimes dance classes cannot give you everything that you need to develop as a dancer and that is when the educated dancer does training, whether it be for strength or flexibility or coordination, outside of class.

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