

## Plyometrics vs. Isometrics?

Let's start this article by saying that they are both important. The question then becomes; To what degree do we work on each of them? Where is the balance?

As those of you who have 'crossed hands' with me will know, it is very difficult to move me. I have been able to stand strong against a 340-pound opponent many times. My movements are unique and anyone who has opposed me will confirm that. Subtlety of core movement allows me to redirect energy very subtly or overtly. The ability to gracefully flow from one position to another in a unique movement is another quality that I have worked diligently on for several dozen years.

These characteristics are inherent in isometric and slow conditioning training. It takes years of effort to develop to a high degree, but well worth it for any performance athlete and especially any martial artist.

Take a look at the Navy Seals, gymnasts, swimmers in the Coast Guard or basketball players. Most athletes are not concerned with bulk, their concern is functional movement. They are very strong yet do not outwardly show immense structure as you might find in powerlifters or bodybuilders.

If you use 90 to 100% of your muscles in an explosive movement you will build cross-sectional bulk. The load that you put on the muscle must adapt and it increases in size and bulk in order to accommodate more and more weight resistance. If done explosively this is plyometrics.

If however, you use the same workload day after day the muscle does not become bulkier it actually becomes more efficient. The cross-sectional firing of the individual muscle spindles become more and more efficient and the muscle uses fewer fibers for the same payload.

Eventually, the muscle becomes so efficient that it has time to regenerate its energy stores through breathing and ATP (please define ATP) loading. The isometric position essentially can be held for an incredible length of time. Talk about your endurance training!

So instead of firing 90 to 100% of the muscles for an increasing payload, we are now firing only 5% of the muscle at any given time for the same payload. The other 95% of the muscle is in a resting and relaxed state.

I have held horse-stance for up to five hours, a push-up hold for two and a half hours, and a sit-up hold for well over an hour. The interesting thing about this personal development is that I can go for extended periods of time not training isometrics and not lose the efficiency and strength of the muscle because of the way it was trained.

In stark contrast, whenever I stopped lifting weights for three to five months I lost my strength and conditioning. The same happens with cardiovascular training. With isometric and slow movement training very little efficacy is lost and what is lost may be easily regained.

Another interesting point about isometrics training, with regards to sit-up position, is that after I held this position for up to an hour every day for several months, I was easily able to do over 4,500 sit-ups in two hours and twenty minutes. I had to stop because I wore out the skin on my lower back.

After doing horse-stance and slow coordinated squat movement, i.e. one squat every 1 to 2 minutes, for an extended daily training over several months, I was able to do three thousand squats with ease. I've also been able to leg press over 800 pounds without ever doing weight training. (is weight training different from the 'weightlifting' you mention above?)

Those who understand the mechanics of eye movement know that they move in a ratchet-type fashion. The same holds true for the eye muscles, ratcheting between the actin and the myosin filaments. This creates a jerk-like motion from one fixated point to another.

When the eye tracks slowly from one place to another it actually moves in small jerks. This is the same with muscles and plyometrics training. From a squat position, the strongest point is the initial grab of the barbell from the floor. During the rest of its upward motion, the body actually relaxes, drops with the arms and moves to the next position to support the weight. Essentially after the first explosive movement the rest of the movement is not engaged.

By doing slow movement and isolation exercises, this jerk-like quality of the muscles begins to be smoothed out. If the exercise is intelligent enough to include a full range of motion while strengthening, we now add elasticity and a full range of motion to the muscles. This provides an incredible base from which to operate. That means that at any point along the muscle contraction, it can support the entire body-weight and can even explosively move from any position.

This is a much more thorough way of training the muscles. Although it takes quite a lot of training time and years of development, for martial arts practitioners, it's well worth it. Especially in advancing age, when the muscles begin to decline and muscle mass diminishes, the strength that is built up in the tendons still remains.

If you look at a cross-section of muscle to tendon underneath a microscope, there is no particular cut off point between the muscle and the tendon. The cells are essentially the same with the addition of more fibrous collagen slowly adding to the differentiating cells. This means that there is a large portion of the tendinous/ muscle material that can be trained. Think of endurance athletes that get better into their late thirties and early forties. Think of the people who are doing yoga well into their eighties and nineties!

So not only does isometric and slow-moving exercise increase strength throughout the full range, it can increase flexibility, if intelligently worked, it can increase muscle efficiency, and it can last for much longer throughout your life. Tendons don't begin to lose strength until their mid-sixties. In addition, because the full muscle is not 100% engaged it can rapidly change directions and offset a much bigger, muscular, and hypertrophic man.

When the body is tense and the majority of muscles are in contraction, the actions become more linear and focused. When the body is more relaxed, the ability to move in more directions and circumlocution (what word replaces this?) movement becomes easier.

So where does plyometrics come in? The ancient sumo wrestlers would mostly work slow and easy for the whole week and only train twice a week for a very short period of time in plyometrics. This way they gain the base of isometric exercise and the ability of complex and fine motor skill movement developed to a higher degree and the explosiveness of plyometrics while minimizing injuries inherent in plyometric training.

Look up HIIT (high-intensity interval training) and even further the Tabata training method. It stresses that in order to increase explosive speed you have to minimize the amount of time that you train in this area. Think of a sprinter, -22 seconds is about as long as the human body can go at full speed. Anything over this particular period of time and you start having to conserve your strength. So little is better in this situation.

There are only a few basic primitive exercises that need to be done isometrically, while there are an incredible array of multiple body-weight exercises that can be done in slow movement conditioning patterns.