

ISOMETRIC TRAINING

HOLDS, PRESSES and MORE

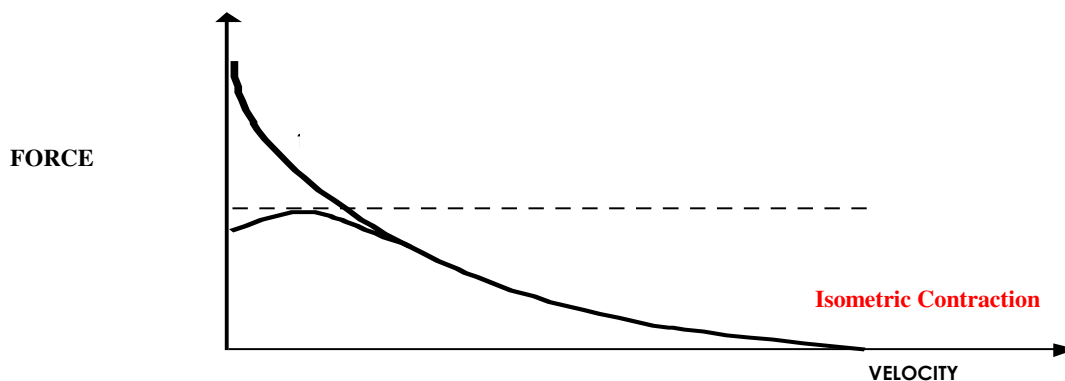
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Iso (same) metric (distance) training refers to method of training in which there is no change in the joint angle. Without movement, great musculotendinous tension can still occur, thus creating a training effect on the



body. Although Isometric means same distance training, movement will occur in the form of shortening of the muscle fibers due to the contractile properties of the muscle. Properly performed isometric training is not just holding a position while looking at the clock for a set period of time. In fact, a focused maximal activation of a muscle or group of muscles is required to properly perform an isometric exercise. In his book Supertraining, Siff states, "Isometric contraction requires a muscle to increase its tension from rest to a maximal or submaximal value over a certain time, to sustain this tension for another period and to decrease this tension to rest or a lower value". It is this increase in tension and maximal activation of muscle fibers, which gives isometric training a place in any performance, based athletic training system.

Force Velocity Graph Depicting Isometric Contraction



In order to perform a movement properly, the CNS (central nervous system) must be prepared to recruit the correct muscle fibers in the proper sequence in order to efficiently initiate movement, stabilize the kinetic chain, and avoid injury. For example, if you were to perform a vertical jump, you would need to perform the downward swing properly to put the muscle of the glutes, hamstrings, calves, quadriceps, and lower back extensors on proper elastic stretch before initiating the upward propulsion phase of the jump. Once these muscles are on stretch (like a spring), the proper recruitment pattern (releasing of elastic stretch) must occur

during the upward propulsion phase in order to maximize the speed of the upward movement. The glutes and hamstrings must extend the hips, the low back extensors must extend the trunk, the quadriceps must extend the knees, and finally just before leaving the ground the calves must dorsiflex the ankle. Never mind the stabilization requirements of the body during such a ballistic movement. If any one of these areas is weak or not firing properly, other muscles will take over the workload, creating faulty movement patterns. One such commonly seen faulty movement pattern is the quadriceps dominant jump. The athlete may have slightly deactivated glute muscles (typically caused by tight hip flexors, overactive hamstrings and lower back extensors), causing more force to be generated from the quadriceps and low back extensors when jumping. Typically the athlete will deep squat with the knees crossing the toe plane during countermovement and over-recruit the low back extensors and quadriceps during upward propulsion. This athlete needs to learn to recruit the glutes and hamstrings during this movement, while decreasing the activity of the quadriceps and low back extensors in order to avoid future injury and increase vertical jump. A great way to teach an athlete to recruit the proper muscles and strengthen the weakest part of the motion (sticking point) is through isometric training.



In his book *Primal Movement Patterns*, Paul Chek states, “To create a new motor (movement) engram it takes 350-500 repetitions. But, to break a faulty movement pattern and then create a new motor program it takes 3500-5000 repetitions.” Getting it right the first time seems to be the logical choice. If an athlete cannot get into position properly, how is this athlete expected to execute a loaded movement correctly, never mind a loaded movement against opposition on the playing field. For instance if an athlete cannot hold the bottom (parallel) of a squat for an extended period of time with proper mechanics and muscle activation, how is this same athlete expected to add a heavy load and movement to this exercise without risking injury. If you cannot hold a parallel squat with correct mechanics and proper muscle activation you are probably not ready to squat dynamically. Now imagine what happens when an athlete whom has not passed these prerequisites decides to squat with large amounts of weight. The shearing forces alone on the spine and knees could lead to acute injury, or compensatory movement patterns which will then lead to chronic injury. An athlete needs to learn to walk before he/she can run, so in this case the athlete needs to learn how to hold and stabilize a squat, before he/she can absorb and generate force in a similar movement pattern.



FORMS OF ISOMETRIC TRAINING:

The types of isometrics we utilize are **iso holds, iso presses, iso contrasts, oscillatory isos, and impact absorption isos**. Below is a brief overview of each.

ISO HOLD: An isometric hold is a static exercise in which the athlete is required to hold a particular position with or without resistance for a required period of time. The athlete is trying to disallow any movement, while trying to recruit the correct muscle fibers to perform this movement. This type of isometric is used to educate the body to properly recruit and stabilize the kinetic chain.

ISO PRESS: An isometric press is a static exercise in which the athlete pushes or pulls against an immovable object for a required time. The athlete is trying to generate as much force as possible, trying to actually move the immovable object. This method of isometric teaches the CNS to recruit more muscle fibers to perform a movement, so when the similar movement is performed dynamically, these “extra” muscle fibers will be readily activated.

ISO CONTRAST: By putting the muscles in the least mechanically advantageous position (stretched position) and requiring those muscles to fire maximally from this position, an athlete is asking his CNS to work overtime. As the CNS allow the recruitment of more muscle fibers to perform this movement, the force being generated is increased. Once the athlete stops the isometric exercise they will then perform a power movement for low repetitions with minimal rest. The theory behind the contrast is based on the fact that the athlete will readily activate more muscle fibers to perform the ballistic movement, when preceded by an isometric exercise.

OSCILLATORY ISOMETRICS: Immediately following an isometric exercise (release all tension), the athlete will perform a single or series of powerful micro-contractions in the same mechanical position as the isometric contraction was performed. Basically all tension will be released from the isometric exercise and the dynamic form of the exercise will be performed with minimal range of motion occurring.

IMPACT ABSORPTION ISOMETRICS: A Form of isometric in which an athlete will absorb a force or impact and immediately perform an isometric contraction for a required time. Upon properly absorbing the impact, the athlete will minimize any change in the joint angle and hold this position.

Guidelines for Proper Isometric Training

1. Proper muscle activation
2. Proper technique and joint angles are required for all isometrics.
3. If you feel any pain in any joint, stop immediately.
4. Use to correct muscle imbalances, teach the CNS to recruit proper muscles, increase strength and power.
5. Apply force gradually.
6. Iso hold time range should be less than 2-3 minutes
7. Iso press time range should be less than 9 seconds.
8. Impact Absorption Isometrics can be held for up to 5 seconds.
9. As an athlete, use isometrics as a supplement to training, as sport is dynamic and thus your training needs to be dynamic as well.

Isometric Training can be of great value to any athlete or trainer looking to increase performance. If the athlete lacks in muscle activation, iso holds can be of great benefit. If the athlete cannot get past a sticking point, iso presses should do the trick. If an athlete is looking to advance their power, iso/ballistic contrasts or Oscillatory isos may help. When done correctly, athletes will find isometrics to be challenging and effective. This method of training will help to break up the monotony of 5 sets of 5, or the latest “greatest workout” found in the magazine at the checkout stand of the local supermarket. Enjoy, Work, and.....Succeed.

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