



## Principles of exercise / sports training

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### **Individuality**

Everyone is different and responds differently to training. Some people are able to handle higher volumes of training while others may respond better to higher intensities. This is based on a combination of factors like genetic ability, predominance of muscle fiber types, other factors in your life, chronological or athletic age, & mental state.

### **Specificity**

Improving your ability in a sport is very specific. If you want to be a great pitcher, running laps will help your overall conditioning but won't develop your skills at throwing or the power & muscular endurance required to throw a fastball fifty times in a game. Swimming will help improve your aerobic endurance but won't develop tissue resiliency and muscular endurance for your running legs.

### **Progression**

To reach the roof of your ability, you have to climb the first flight of stairs before you can exit the 20<sup>th</sup> floor and stare out over the landscape. You can view this from both a technical skills standpoint as well as from an effort/distance standpoint. In order to swim the 500 freestyle, you need to be able to maintain your body position and breathing pattern well enough to complete the distance. In order to swim the 500 freestyle, you also need to build your muscular endurance well enough to repeat the necessary motions enough times to finish.

### **Overload**

To increase strength and endurance, you need to add new resistance or time/intensity to your efforts. This principle works in concert with progression. To run a ten kilometer race, athletes need to build up distance over repeated sessions in a reasonable manner in order to improve muscle adaptation as well as improve soft tissue strength/resiliency.

Any demanding exercise attempted too soon risks injury. The same principle holds true for strength and power exercises.

### **Adaptation**

Over time the body becomes accustomed to exercising at a given level. This adaptation results in improved efficiency, less effort and less muscle breakdown at that level. That is why the first time you ran two miles you were sore after, but now it's just a warm up for your main workout. This is why you need to change the stimulus via higher intensity or longer duration in order to continue improvements. The same holds true for adapting to lesser amounts of exercise.

### **Recovery**

The body cannot repair itself without rest and time to recover. Both short periods like hours between multiple sessions in a day and longer periods like days or weeks to recover from a long season are necessary to ensure your body does not suffer from exhaustion or overuse injuries. Motivated athletes often neglect this. At the basic level, the more you train the more sleep your body needs, despite the adaptations you have made to said training.



## **Reversibility**

If you discontinue application of a particular exercise like running five miles or bench pressing 150 pounds 10 times, you will lose the ability to successfully complete that exercise. Your muscles will atrophy and the cellular adaptations like increased capillaries (blood flow to the muscles) and mitochondria density will reverse. You can slow this rate of loss substantially by conducting a maintenance / reduced program of training during periods where life gets in the way, and is why just about all sports coaches ask their athletes to stay active in the off season.

The principles of specificity, progression, overload, adaptation, and reversibility are why practicing frequently & consistently are so important if you want to improve your performance. Missed sessions cannot really be made up within the context of a single season. They are lost opportunities for improvement. Skipping your long ride on weekend A means you can't or shouldn't go as far as originally planned on weekend B (progression & overload). Skipping your Monday swim means your swimming skills & muscles won't be honed or stressed that day (specificity). Missing a week due to a vacation sets you back more than one week (adaptation & reversibility).

Don't shoot the messenger! ☺

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