



Proprioception Training

Proprioception is often referred to as a sixth sense that creates our physical awareness by constantly communicating the body's position to the brain via receptors located throughout the body, even in fascia^{30,31,32} and spinal ligaments.²⁹ It allows the body to regain balance during a slip or to touch the nose while the eyes are shut.

It is mostly an unconscious system that functions along with the vestibular system (inner ear) to provide the sensory input needed to respond to our physical environment. Whether the body responds appropriately or not depends on the condition of these two systems along with the conditioning of the neuromuscular system.

The proprioceptive system has the ability to cause specific muscles to contract or relax through unconscious reflexes^{18,19} and is the same system responsible for the stretch reflex. For example, when stretching the hamstrings too far or too fast, muscle spindles will cause a reflex contraction of the hamstrings to control and resist the movement.

Significance of Proprioception

If one was to lose most or all of their proprioception they would not be able to reach for a drink while talking to someone and still maintain eye contact with that person. They would have to constantly watch their hand (because the proprioceptive system isn't telling the brain where it is) and consciously move it towards the cup through the feedback of the eyes. Then do the same thing on the way up to the mouth.

This is basic proprioception that most people have and don't need to train for but it shows the main principle of proprioception that is strived for, and that is being able to perform efficiently during complex movements without having to think about it.

For example, specific repetitive training can improve proprioceptive ability and teach the neuromuscular system how to properly jump, throw, and land while only having to think about who to throw it to, not how to do it. Or it can train the system to instantly and unconsciously react to slips and falls.

With the exception of sleeping, the body is constantly utilizing proprioceptors for simple, complex, unconscious, and conscious movements. It is for this reason that Exercise Progression spends a lot of time developing this sixth sense in order to develop a more efficient neurological system to control the muscles.

Many people do not have the ability to properly access their neurological system and recruit the specific muscles needed in order to strength train efficiently because they have been inactive for a prolonged time or have numerous compensations throughout the body.

This is where posture balancing exercises followed by proprioception training will 'wake up' the neuromuscular system and encourage better strength training results.

The soles of the feet are the foundation for proprioception while standing, so there must be an emphasis on proper foot positioning. It is commonly called "small (or short) foot" and is helpful for increasing afferent input (neurological input to the brain), mostly from the sole.^{4,41}

The short foot position is accomplished by bringing the ball of the foot towards the heel, without curling the toes, which will raise the arch a little bit and place the entire body in a position that is well suited for coordination and balance.

Of course overall posture must be aligned in order for the body to be properly placed over the feet. This takes practice and often requires repeating many times while sitting before it can be done standing.

Summary

Every movement or exercise involves the proprioceptive system, so a key to improved performance and function is to *properly* stimulate the system to obtain a specific coordination.

The saying "If you don't use it you lose it" definitely applies to proprioception. As we grow older or more sedentary our proprioceptive team "sits on the bench" more than it "plays" and thus becomes deconditioned and slow to react. This can be improved with specific training no matter how long it has been inactive or how old the person or injury is.

Proprioceptive training is a necessity if the maximum benefits of exercising or rehabilitation are desired because it allows the muscles to fire on all cylinders. Proprioceptive training is also great for warming up the neuromuscular system prior to exercise.

If someone has abnormally poor proprioception and coordination it is useful to their diet; B12 deficiencies are associated with a poor sense of balance and joint position awareness, clumsiness, and decreased reflexes to name a few of the many side affects.¹²⁸