

Proprioceptive Exercises!! A Need or a Myth??

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Proprioceptive system is made up of the receptors and the nerves in the joints, muscles and the ligaments around the joints. These receptors send signals to the brain. The brain then on the basis of the tension or stretch noted by the receptors gives the signal to a particular muscle to contract or relax. This is a subconscious system and sometimes take place within a fraction of a second. But after any injury may it be traumatic or overuse, the receptors get damaged or become subdued and function less. This leads the joint to feel odd, or not right.

Proprioceptive exercises, also known as closed chain or weight bearing exercises are of utmost importance during any rehabilitation program. Many therapists include these exercises to some level in lower limb rehabilitation but do not include them in the upper limb or back rehabilitation.

Proprioceptive exercises have several benefits. Firstly, it improves the joint position sense in a person. This is important for all individuals. In elderly, the increase in this will decrease the risk of fall, while in athletes and children it will make them more agile. Having a better joint position sense gives the brain a feedback of what is going on with the body, and hence helps it maneuver the body better with less effort.

Secondly, it improves the balance of a person. Whenever, proprioceptive exercises are added to a rehabilitation program, the goal is to achieve balance in those exercises. Now it can be double leg balance training or single leg balance training. The same can be done with upper limbs, by including both or single limb. By doing balance exercises, the brain gets a signal to train the muscles of that limb in a particular way. When a person does balance exer-

cises, all the muscles of that limb along with the contralateral limb and the core are working in synergy to maintain that position. This brings a co-contraction which is useful in doing daily activities like standing, sitting and walking. This is also very much required in the athletic population, as having a good single leg balance reduce the risk of injury in them. Inclusion of single leg balance exercises is useful, because it trains the body under its own weight and is helpful in walking or running during the single leg stance phase. The level of training can be varied by altering the difficulty range in the activity. Like for elderly, a single leg standing with eyes closed on a floor or balancing pad maybe enough while for an athlete, single leg standing on balance pad while catching multidirectional medicine ball throws and being distracted by another athlete maybe required.

Thirdly, proprioceptive exercises are also beneficial in maintaining the bone mineral density. Weight bearing exercises, put a controlled and desirable load on the bones and cause a tension on the surface of the bones by the muscles. This helps in the growth of the bone. The demineralization of the bone takes place on a daily basis, with or without any activity. It is a natural process which cannot be stopped. But the remineralization process of the bones are heavily affected by the weight bearing exercises. It has been proven by several studies that the person doing more weight-bearing exercises has better bone density. This is why the bone density of a player (of an active running game) is usually higher than a non-athlete.

Some may argue that, the proprioceptive exercises of upper limb are not of any use, as we do not walk on our hands. They are right we do not walk on our hands because we are bipedal by nature using our legs for locomotion. But we do have dexterity in our hands

which most animals don't. Due to this dexterity we do a lot of our work with hands. We pick up objects, move them around, use upper limb to support us in case of getting up or falling down and in several other ways. This means that the upper limb balance and strength is of equal importance. Hence, the benefits of the proprioceptive exercises mentioned above are applicable in the upper limb rehab as well.

Lastly, the inclusion of proprioceptive exercises, shortens the recovery time, and helps the patient to get back to his/her professions quickly. It also reduces the risk of recurrence of the injury, especially in the athletic and elderly population.

The amount of inclusion and the difficulty level of such exercises should depend on the end goal to be achieved. That is one size fits all doesn't work here. You have to develop the exercise program in accordance to the person's lifestyle, profession, age and many other factors. But what is important that these exercises are included in some form or the other.

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