

# AthletiHINTS



**AthletiCare**

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## Proprioception

### Introduction

Proprioception is the information received from mechano-receptors which assists a person in knowing where their limbs are in space without the use of vision. This helps us maintain our balance. Following injury, repaired tissue is never the same as it was prior to injury. Nerve fibers and receptors do not regenerate, and this may cause a loss of joint position sense. Retraining using appropriate exercises is essential for any physical activity.

### Importance of Proprioceptive Training

Joints unprotected by adequate proprioception are at risk of re-injury, and frequently the subsequent episodes are more serious than the first. A good example of this is the recurring ankle sprain. In this case the nerve receptors in the joint are often unable to feed back the information to fire the muscles about the ankle to co-contract and stop the ankle from giving way, especially on an uneven surface.

Proprioceptive information also protects the joint from damage caused by excessive movement and helps to determine the appropriate balance of the muscle action.

### Reactive Neuromuscular Training

After an athlete has regained full range of motion, adequate strength and is full weight bearing, then reactive neuromuscular training (RNT) can begin. The main objective of RNT is to return the athlete to his/her pre-injury activity level as quickly and safely as possible. This is accomplished by improving the dynamic muscular stabilization of the joint in regard to both position and motion. RNT activities are designed to restore both functional stability about the joint and improved muscle control by manipulating the environment to achieve the appropriate response.

### Rehabilitation Guidelines

The ultimate goal of recovery is returning the damaged structures back to the activity that caused the injury. The use of a balance board and activities involving repositioning the center of gravity will aid in this re-training. Balance activities with eyes open and closed will enhance motor function at the brain stem level. These activities should remain specific to the types of activities or skills that will be required of the athlete upon return to sport. The general progression is to progress from double to single leg and with eyes open to eyes closed. These activities should first be performed on a stable surface and then progress to unstable surfaces such as a foam mat, mini tramp, or a balance board. The athlete can also add activities for distraction and imbalance, such as throwing and catching a ball.

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**Frappier Acceleration**  
Sports Training

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A progression of activities after a knee or ankle injury may be as follows:

1. Single leg stance while rocking forward onto toes and then back on the heel.
2. Exercise tubing can be added at this phase and is used by pulling two fixed pieces of tubing towards the body and then returning it to the start position. The more vigorous this is done, the greater the need for stabilization. The direction can be varied to challenge the athlete.
3. Squatting and lunges (single and double leg), with use of exercise band for resistance.
4. Bounding and hopping in all directions. (Use of 5 dot drill.)
5. Single leg tilt board activities.
6. Balancing both single and double leg on a foam roller or noodle.