



Injury Prevention: Ankle Sprains

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Gymnastics requires jumping, changing direction, and pivoting, all of which increase the risk of ankle sprains¹. After an ankle sprain, there is a much higher risk of an athlete having another sprain². Therefore, it is important for gymnastics conditioning programs to include exercises to help reduce the risk of ankle sprains.

Research shows that incorporating proprioceptive training can reduce the risk of ankle injury^{3,4}. Proprioception is defined as the process by which the body takes in sensory input from the environment and integrates that information to produce a motor response¹.

A review³ of well-designed research articles showed that proprioceptive exercises can reduce the overall risk of ankle injury in athletes (regardless of whether they had a prior ankle injury or not) by about 35%. In athletes who have had a previous ankle injury, proprioceptive exercises can reduce the risk of re-injury by about 36%. In athletes who have never had an ankle injury, the review showed that the risk of injury could be reduced by around 43%.

Gymnastics conditioning programs can include proprioceptive exercises using equipment that is already in the gym. Generally, balance exercises that are done on a firm, stable surface with eyes open are the easiest. Progressions can include, closing the eyes, moving the arms, leg or head while balancing, balancing on a soft or unstable surface (like a mat or a wobble board), balancing on the toes, and hopping while balancing. Some examples of exercises that can be included are (listed easier to harder):

- Balancing on one leg on a firm, flat surface for 30 seconds
- Balancing on one leg on a 4" mat for 30 seconds
- Balancing on one leg with eyes closed for up to 30 seconds
- Balancing on one leg while passing a foam block to a partner in a variety of different ways (1 or 2-handed underhand, 1 or 2-handed overhand, to the side)

¹ Han J, Anson J, Waddington G, Adams R, Liu Y. . The role of ankle proprioception for balance control in relation to sports performance and injury [published online Oct 25, 2015]. *Biomed Res Int*. doi: 10.1155/2015/842804.

² Hung YJ. . Neuromuscular control and rehabilitation of the unstable ankle. *World J Orthop*. 2015; 6 5: 434– 438.

³ Rivera MJ, Winkelmann ZK, Powden CJ, Games KE. Proprioceptive Training for the Prevention of Ankle Sprains: An Evidence-Based Review. *J Athl Train*. 2017 Nov;52(11):1065-1067. doi: 10.4085/1062-6050-52.11.16. Epub 2017 Nov 15.

⁴ Schifftan GS, Ross LA, Hahne AJ. The effectiveness of proprioceptive training in preventing ankle sprains in sporting populations: a systematic review and meta-analysis. *J Sci Med Sport*. 2015 May;18(3):238-44.

- Balancing on one leg and reaching for targets with the foot of the other leg that are in front, to each side, on a diagonal, and/or behind the athlete while keeping the knee and hip in good alignment (start on a firm, flat surface and progress to standing on a sting mat)
- Balancing on the toes (on relevé)
- Balancing on one leg and hopping in a known direction with a 3 second hold after the hop (i.e., everyone hops forward with a hold 10 times, then to the side 10 times, then backward 10 times, then to the other side 10 times)
- Balancing on one leg and hopping in clock direction (i.e., 7 o'clock) that the coach or leader calls out with a 3 second hold

The key to success in using proprioceptive exercises is that they must be consistently performed (at least 3 times per week) and they should be progressed when they start to get easy for athletes to perform. Make sure to continue to include ankle strengthening and flexibility exercises in your conditioning as those are important, too!