

# “Proprioceptive Training in Handball”

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It is well-known that contemporary handball is much tougher, faster and more complex than the one played in the 1990's. Compared to that period, the body contact and time playing strength are far more powerful.

It must be emphasized that these changes in the game dynamics (performance speed, attack development, technical complexity of the performance etc) have an effect on the body, by subjecting it to great physical stress.

Some of the previously emphasized aspects are the subject of many statistical studies, following important international events (EUCh, WCh, OG), studies that were individualized on certain game sequences

(Taborsky F., Pollany W., Holdhaus H.)

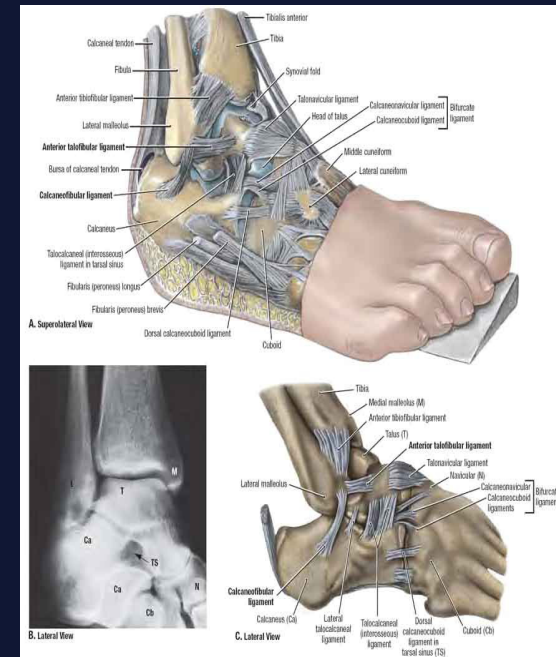


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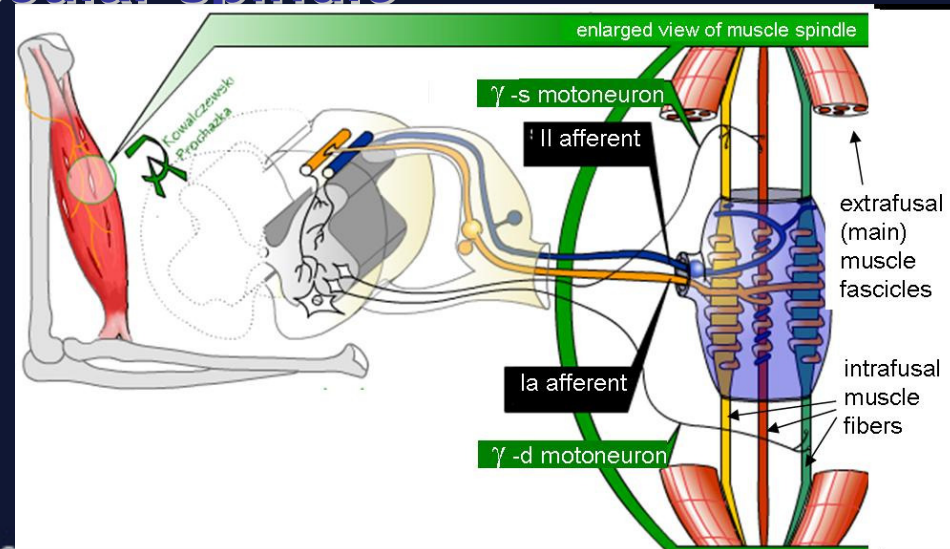
This physical stress also determines an increase in the number of injuries in top handball players (Hans Holdhaus, Manavis K & col), and we can say that the ankle is one of the most exposed joints.

We also have to mention the fact the conjuncture factors are equally important during a match, respectively, the desire to execute motor structures with a high degree of technical complexity in critical situations during the game, meaning the last seconds of the game, or extraordinary psychological pressure (Pollany W., Constantini D., Pokrajak B), pre-passive, numerical inferiority (Juan de Dios Roman Seco) etc.

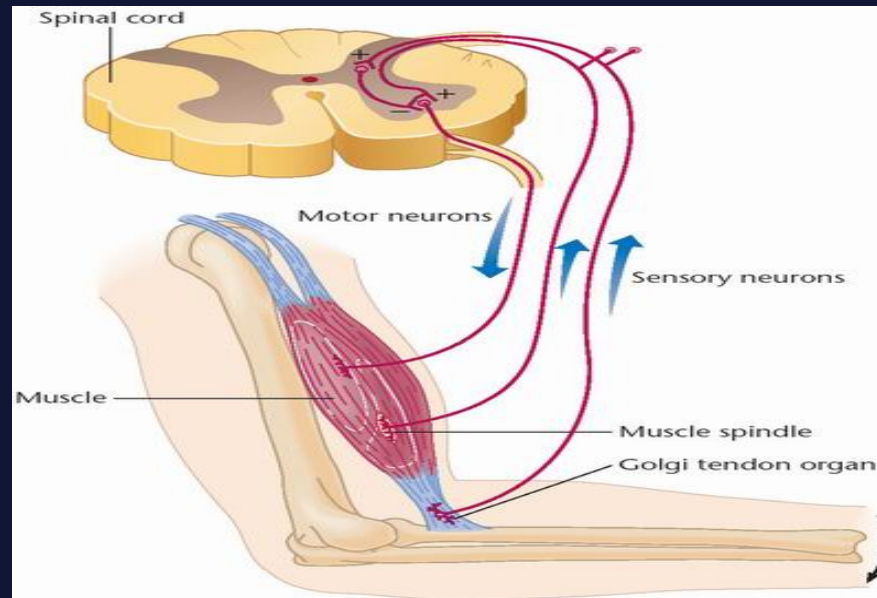


•In our opinion, all of these above should be evaluated and analyzed also from an anatomical-physiological point of view, because the **proprioceptive** component of the movement is **decisive** for prophylaxis and for reducing the severity of the injuries, as well as for reducing the post-traumatic recovery period.

•We will not be getting into anatomical details, such as: the muscular component of the **proprioception**, represented by the “**muscular spindle**”



and the one in the tendons, the “**Golgi Tendon Organs**”,



but specialized studies underline the importance of the **proprioceptive factor** for the efficiency of the handball performances, as well as for improving the incidence of injuries in handball (Marzinka Z.) in general, and at ankle level (Quinn E.) in particular.



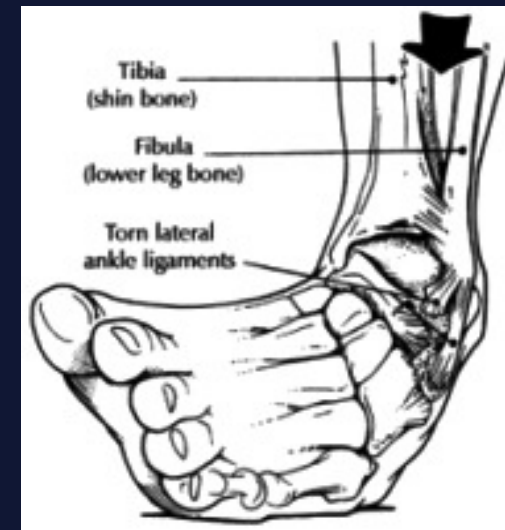
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## Proprioception

Proprioception is the body's ability to get information to the brain in response to a stimulus arising within the body; it also refers to the body's ability to sense the position of its limbs at any moment. For example, an athlete who has gone airborne and then lands on an opponent's foot may injure his/her ankle if his/her brain does not sense that he/she is landing on someone's shoe and not the floor. (Lorin A. Cartwright, William A. Pitney, 2005).

The term of proprioception refers to a sense of joint position. Proprioception training is highly common in rehabilitation of injured athletes, but it can just as easily be used to prevent injury. Even a strong ankle can sprain when running on uneven ground if the runner hasn't trained the neuromuscular system to react appropriately. Slight deviations in terrain require slight adjustments of balance to avoid injury. (Elizabeth Quinn, 2008).



- Because an athlete may have deficient proprioception due to an injury, many Athletic Trainers believe that proprioception should be addressed in the early stages of a therapeutic exercise program, and thus many rehabilitation programs emphasize early proprioceptive training.
- Proprioception training can be started early in a therapeutic exercise program by doing such things as balance or coordination exercises (Lorin A. Cartwright, William A. Pitney, 2005).



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# A Simple Balance Exercise Reduces Risk of Ankle Sprains

*Just 5 minutes on each foot can make a big difference*

Elizabeth Quinn, 2008.



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# Balance Training and Proprioception



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- The drills presented in this material, to be used during training sessions, can be approached also from different perspectives.
- The biochemical and physiological aspects have a determining role for a successful athletic technical performance, even if, apparently, their influences are insignificant (Alexandru Acsinte, 2004).
- Thus, the ideomotor representations, the body scheme, the self confidence, all viewed through the theories expressed in *Imagery in Sport*, can lead to the following aspects.



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If we consider the simplest performance using the BF, that is standing in a balanced position with both feet on two BF, apparently this does not strain too much the individual's abilities, no matter the personal motor experience, or sports branch they are currently practicing.



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But when this drill is performed with eyes closed, things get a little complicated. In this kind of situation, different components spring into action for maintaining the body in balance, and other analyzers are strained, such as the vestibular analyzer and the proprioceptive elements, not just the eyesight.



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It may seem weird, but during performances with eyes closed, even hearing appears to have an important role in maintaining balance, especially when the drill is performed in the company of other team-mates, or partners.

Repeating this kind of drills alternatively with eyes opened and closed, leads to the creation of ideomotor schemes that help the athlete to get faster into a balanced position, in both circumstances

(Alexandru Acsinte, EfteneAlexandru, Alexandra Milon, 2009).



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The studies we conducted on Team Handball goalkeepers have shown that even simple dynamic drills (e.g. jumps from the floor on the BF discs) can be performed with eyes closed, after these drills had been internalized and became automatic during normal training conditions.



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Why do we need these drills to be performed with eyes closed?

Mainly to increase the accuracy and quality of the performances. As mentioned by specialists (Schmidt, quoted by Tony Morris, Michael Spittle, Anthony P. Watt, 2005, page 128), the professional athletes receive and process large quantities of information quickly and accurately, in order to monitor and adjust their performances.

The same authors (Morris, Spittle, Watt, 2005) mention that “visual imagery” is “seeing” the performance, or being instructed to picture yourself the performance.

As a consequence, the kinaesthetic and proprioceptive information (position of the body, the degree of contraction of certain body segments, the trajectory of the performances, even the relation with certain objects) received by the athletes are of real use to them in accomplishing top-notch performances.



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So, according to all of this, we consider that a classification of the BF drills could be as it follows:

•Walking drills



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## •Lunge Drills



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## •Jumping drills



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## •Jumping drills



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## •Jumping drills



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All these drills (stimulating proprioception in special conditions—on mobile surfaces, BF, etc.) performed in a particular manner (with eyes closed), can contribute to an increase in the quality of athletic performance, especially during game situations with a high psychological stress (the end of a match, a tie-in, numerical inferiority situations etc.), as well as during situations demanding technical performances in unnatural body positions (unbalances in the air, passes, throws, hitting the ball from a fall determined by a rough action from the opponent etc.)



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# THANK YOU !



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