

SENSORIMOTORIC: LOCAL MUSCLE SYSTEM

In 1990 an Australian research group [led by HODGES] discovered that small muscles near the spinal segments and joints – known as “local muscle system” – react significantly before the “global muscle system” and the ligaments stabilize.

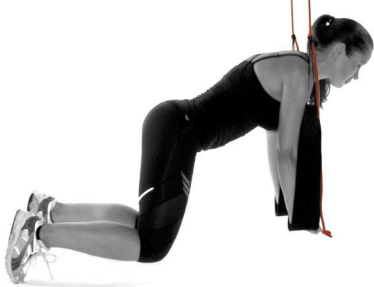


Fig. Slingtraining Austria

The activity of the local stabilizers depends on the performance of our sensorimotoric system. The information from the sensors on our skin, ligaments, muscles, joints, capsules and tendons define conditions for control and regulation with regard in stabilizing the spine segments and the joints, especially concerning the interaction between the “local” and “global” muscle stabilizers.

For example, immediately before throwing a handball, the sensorimotoric system is responsible for activating the “local” muscle system in our shoulder [rotator cuff] and the muscles in the nearby segments [invertebrate muscles - especially mm. multifidii and mm. rotatori longi et brevis]. That means our body reacts first with the activation of the “local” muscle system to control segments and joints, immediately before movement.

This way of neuromuscular stabilization is called the „feed-forward-mechanism [Cresswell et al 1994].”



Fig. Slingtraining Austria

Moseley GL, Hodges PW, Gandevia SC: Deep and superficial fibers of the lumbar multifidus muscle are differently active during voluntary arm movements [Spine 2002; 27:E29-E36].

For this reason, it is apparent that the conventional strength program for knees, shoulders, hips and the spine is only a part of training for prevention and performance development.

Knowledge of the “local” muscle system is also very important with regard to injuries.

Pain reduces the flow of information from the sensors. Therefore the “feed-forward-mechanism” does not work at the highest level and shear forces at the beginning of movement in the segments and joints are a normal and logical consequence. Specifically, we are speaking about motor control deficit, which is the basis for experiencing more injuries and more frequently.



Fig. Slingtraining Austria

The latest knowledge of neuro- and muscle physiology has shown us that if the body is confronted with aggressive, fast and unstable stimuli, the „local” muscle system reacts and stabilizes the segments and the joints.

SLINGTRAINING – the neuromuscular way of stabilization

Exercises with the **REHAPE® Slingtrainer** give us the possibility, based on the unstable vibrations of the ropes, to activate the “local” muscle system effectively. This is the base for stabilization training.

First comes the activation of the “local” system, then the training of the “global” [moving] muscle system follows.



Fig. Slingtraining Austria

During the „EHF youth coaches course“, we speak about functional muscle chains and exercises on unstable training devices for injury prevention and performance development.

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