

Foot Orthotics: Use in the Treatment of Overuse Injuries

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Foot orthotics encompasses the field of knowledge about improving the function of the foot. The use of foot orthotics has gained acceptance and popularity in recent years. Approximately 80-90 percent of the athletes who come into my office need a foot orthotic.

Many sports injury professionals do not realize that many athletic overuse injuries of the lower extremities are caused by poor foot biomechanics. The successful sports chiropractor must be able to diagnose and treat overuse injuries caused by inadequate foot biomechanics.

The most common biomechanical abnormality of the foot is overpronation. It has been estimated, by several well-known authors, that 60-90 percent of the general population overpronates somewhat. Many injuries to the body may be due to overpronation. Overpronation of the foot may cause pain in the leg, knee, hip or lumbosacral region.

David Walther, D.C. states, "After correcting a very difficult shoulder condition by treating the patient's overpronation, a new rule was practiced in our office: New patients are not examined with their shoes and socks on. It is important to at least screen the foot for a possibility of contributing to remote health problems."

Overpronation of the foot takes place in the sub-talar joint. The sub-talar joint is located between the talus and the calcaneus and is considered the keystone joint of the foot. Supination and pronation are normal motions of the foot. Overpronation of the foot causes the tibia to medially rotate. This rotation has an effect on the femur, patella, ilium, sacrum and the entire musculoskeletal system. Overpronation causes 60-90% of all foot and lower extremity pathologies associated with overuse injuries.

Examination Procedures

Examination procedures for overpronation are simple to perform. The patient stands facing the doctor with his shoes and socks off. The patient should then alternately stand on one foot and then the other. The doctor observes for a medial rotation of the tibia and a medial rotation of the foot. The doctor can also observe the patient walking and running. The use of a video camera is especially effective for determining overpronation. With this replay of the video, the patient can see the actual overpronation of his own foot while walking or running.

To fully understand overpronation, one must have a working knowledge of the gait cycle. The gait cycle is defined as the motions of a leg from the heel strike of one foot to the heel strike of that foot again. The gait cycle has two phases: the stance phase and the swing phase.

The stance phase is the most important part of the gait cycle in relation to sports injuries. The stance phase is divided into three parts: the contact phase, the midstance phase, and the take-off phase.

The contact phase is from the heel strike until the foot is flat-footed. Normal contact is with the foot in a slightly supinated position and the heel contact taking place on the lateral side of the heel. In this plane, the foot rapidly pronates which allows for shock absorption and for the foot to adapt to the terrain. The midstance phase is from the flat-footed position until the heel lifts off. In this phase the foot supinates to become a platform for support of the body's weight. This phase can be described as a conversion to a rigid lever.

The take-off phase is from heel-lift to toe-off. In this phase the foot continues to supinate and the tarsals are locked for the foot to become a rigid lever.

Today's sports injury specialist must be able to diagnose abnormal foot biomechanics to successfully treat the cause of many sports injuries. Usually, a foot orthotic is required to correct overpronation of the foot.

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