# Foot Pain

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Concord Sport & Spine Physiotherapy

## Stress Fractures of the 2nd Metatarsal in Dancers

Stress fracture at the base of the 2nd metatarsal is the most common stress fracture in ballet dancers, with 1/3 of all the stress fractures occurring at this site. This injury results in the dancer experiencing long periods of pain and disability. The 1st metatarsal is usually greater in length than the 2nd, which allows it to take increased loads. The 2nd metatarsal is more rigid because of its articulation with the middle cunieform. This rigidity provided to the forefoot allows stress to be carried through the 2nd metatarsal and thus to the mid-foot. For this reason the 2nd metatarsal naturally carries higher stresses.

During the year of 1991, the Australian Ballet Company reported 9 stress fractures amongst their dancers. However a prevention and education program instituted by the sports medicine team has resulted in a significant reduction since that time. During recent years there have been no reported stress fractures. The reason for this could be due to a multiple of factors. It was felt that the cause of this condition may be multi-factorial and the pre-disposing factors may vary from dancer to dancer. A key factor in prevention was thought to be the identification of early warning signs. It was theorised that dancers often experience intrinsic muscle fatigue and cramping prior to the onset of pain. This has been implicated as a contributing factor. Dancers have been educated in the importance of not ignoring cramping sensations, and to immediately consult their physiotherapist. If tenderness to palpation was found at the base of the 2nd metatarsal, their workload was assessed and reduced as necessary. Often the modification to the dancers workload were minimal and of short duration, generally 2 weeks.

Treatment, if instituted, was often aimed at restoring mobility by mobilisation to relevant joints in the foot or ankle. The peroneus longus was often found to be tight and overactive requiring soft tissue releases, while strengthening of the medial stabilisers was also often necessary. Strengthening was always conducted with attention to improving proprioception and endurance. Fatigue of the foot and ankle plantar flexors has been demonstrated to increase stress in the 2nd metatarsal. It is important to spend time educating the dancer on correct technique, encouraging consistent pressure through both the first and second metatarsal while raising and lowering the heel to the ground. Certain technical faults which may contribute include clenching of the foot, lifting of the toes at the wrong time, incorrect weight transfer, knee hyperextension, and poor landing control. Other possible contributing factors could be sudden increase in workload, deconditioning following a break in training, poorly fitting shoes, routines involving a lot of running, and landing on hard floors.

During periods of high risk the dancers were scheduled for additional massage and physiotherapy sessions. It is worth noting that the sports medicine team felt that anti-inflammatory drugs were counter-productive, as the analgesic effects of the drug may lead to the dancer not recognising the early warning signs.

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