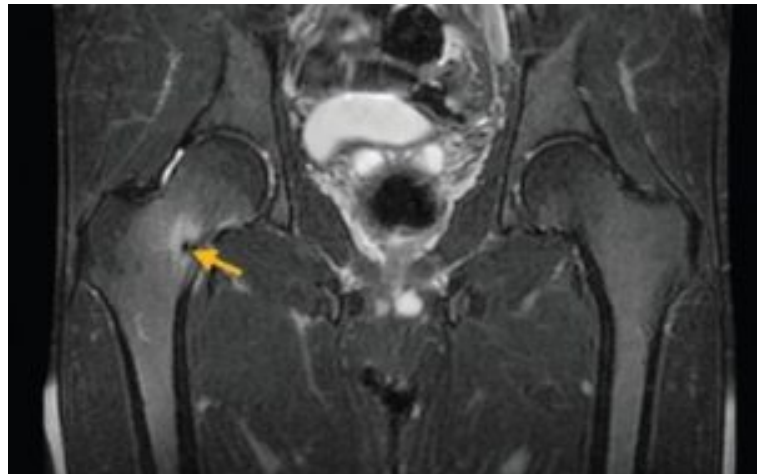




A stress fracture is essentially an overuse injury that occurs most commonly in the bones of the lower limbs, particularly the shin and bones of the foot. Healthy bones do not fail under a single, normal stress however, cumulative loads can have a detrimental effect.

Bone is a dynamic structure and is in a constant state of micro damage and repair to maintain the strongest but lightest structure possible. It adapts to intermittent, repetitive compressive and tensile loads by producing new bone and increasing bone density. During periods of inactivity, the density of the bone decreases, “use it or lose it”. If loads on the bone become abnormally high or repetitive and it is not given adequate rest to allow for adaptation to these loads, breakdown occurs at a faster rate than repair, resulting in a stress fracture. This commonly happens with increasing training loads too quickly, training too hard and not resting enough between training sessions.

The forces contributing to bone stress include direct impact and forces generated by the pull of ligaments and tendons on the bone. Traction forces are more dangerous to bone failure and injury than compressive forces. The initial injury produced by repetitive load can be hard to measure or detect clinically, the areas of damage are quite small, widespread and not visible on xray. Bone scans and MRI can detect increased metabolic activity in the area and are the investigations of choice to diagnose a stress fracture. In quite serious cases, although rare, the bone reacts in a similar way to fatigue fractures of other materials and an actual visible fracture line can be seen on x-ray and MRI.



## Signs and Symptom

- Stress reactions often start with an acute onset of pain during or after physical activity
- The pain worsens with increased loading.
- There is often a focal area of tenderness over the area and localised swelling.

- The diagnosis is most commonly made through clinical assessment, but imaging can assist in grading the more severe injuries.
- Other factors that can predispose the bone to stress injuries are muscle fatigue, foot type, shoe selection, hard surfaces, osteopaenia, bone disorders and hormonal imbalances.

## Management

Initial management and treatment of stress fractures involves offloading the area. In the case of the lower limb, this may involve use of a cam walker boot or crutches, to allow the body to heal and repair the area. Like a conventional fracture of the bone, this healing will take place more quickly when a controlled amount of load is placed on the affected area, rather than completely immobility. Typically, these injuries take between 4-6 weeks to heal.

Part of physiotherapy management of these injuries is to determine any biomechanics and muscle imbalances that are driving the abnormal loading patterns through the bone to avoid recurrence of the injury. An individualised rehab program that targets the specific issues can be implemented in the 6 weeks that the bone is being off-loaded. The dynamic nature of bone structure and active remodelling that continuously occurs, physiotherapy facilitates a gradual return to activity, after adequate healing time. Bone strength will only increase gradually even though you may experience a sudden decrease in your symptoms and your physiotherapist will guide you on a safe return to exercise program.