

## Stress Fractures - Fast Facts:



## How you can avoid and treat them

### What is it?

Small repetitive traumas and an overwhelmed 'bone rebuilding system' can lead to an irritation and swelling in a section of bone (**stress response**) and can even develop a crack through it (**stress fracture**).

They generally happen in older children or young adults who have recently increased their training loads, especially female runners, gymnasts and dancers, and also ball/racket sport participants.

### Risk factors that you can readily change (with some help)

Activity intensity, frequency and duration, gait and cadence modification, calorie and calcium intake, as well as Vit D can all be factors.

**Manage your training loads by slowly graduated increases** in intensity, distances, speed or duration of activity. Appropriate use of rest days, cross training and protective equipment (such as shock-absorbing innersoles) can avoid overloading one particular anatomical site. Cross training may include an integrated program of cycling, swimming, weights, boxing, yoga or pilates replacing aspects of your 'impact' activity (ie. running).

**Running style and cadence** can impact the degree of focal forces on the lower limbs and feet, as can the 'hardness' of the running and playing surfaces. Strength training for calf muscles and gluteal muscles, as well as core strength work, can all assist in injury prevention – so speak to your sports physiotherapist about gait analysis (walking and running) and tailored strength and conditioning program to help avoid or recover from stress response injuries.

**Low calorie intake affects the ability of the body to repair** the damaged swollen 'stress response' in the bone. Usually we tell people to lose weight in order to off-load their joints. This is one case where an increase in calories and nutrients may actually help you to heal faster. Some sports and careers have aesthetic elements ingrained, with low calorie availability impacting the bodies normal hormone functions that help to repair your bones and keep you healthy. With appropriate advice there is always a safe way through this issue so if you have concerns please see your sports doctor or dietitian.

**Low Vitamin D and dietary calcium can be addressed** with simple supplements or sometimes just dietary changes. Sun exposure also assists Vitamin D but care is required not to increase skin cancer risk.

### Risk factors that are more complicated but still may be able to be changed!

**Anatomical differences and digestive issues** can also be factors. Anatomical issues, such as a longer second toe than the first toe, can cause an abnormal focus of force on certain segments of bone. Malabsorption issues, such as Coeliac's disease or lactose intolerance, impact on the body's ability to accumulate nutrients to repair bone damage. Once identified, these factors can be partially mitigated, so talk to your sports doctor or physiotherapist/dietitian if you have concerns.

## Investigations

**Careful clinical examination and questions** always precede investigations. Clues include local tenderness, pain on weight bearing or stressing the bone – especially in the context of several weeks or months of increased repetitive activity.

**Plain xrays** will detect most prominent stress fractures but may miss subtle fractures. If a fracture is still suspected but not seen on an xray, **MRI scans** are used as they have a more sensitive ability to detect stress fractures. Bone scans can be used in place of MRI, as they are just as good at ‘not missing’ a stress fracture, but bone scans are less able to rule out ‘mimicking conditions’ - so MRI is preferred, where available.

Please see your sports doctor for advice, referral and interpretation of results.

## Minimising conditions that need to be ruled out

Other less common conditions may need to be ruled out in some cases of suspected stress fracture. Although less likely, bone infection (which can be spontaneous) and bone tumours may require further investigation in certain cases.

## Treatment – the Four R’s

The four **R’s** - **Rest** and **Risk** factor modification, **Regulation** of activity, **Return** to full activity – are each required for 2-4 weeks minimum, for a total of 8-12 weeks. If you push too hard too soon and pain is experienced at any stage, supervised regression back through the stages is required before progressing to the offending activity again – so the tortoise may beat the hare at this one.

**Rest** – Sometimes crutches are required for total non-weight bearing for the affected limb. Other times an orthotic walking boot may suffice, depending on the fracture’s location and its severity.

**Risk factor modification** – Correction of Vitamin D, calcium and calorie intake by careful dietary review. Gait/running retraining and orthotics or other specialised protective equipment.

**Regulation of activity** – Progression of basic weight bearing to very gradual introduction of light training activities. This also needs to correspond with planned reduction of aspects of training load and increase in aspects of strength training and conditioning. This requires careful planning and supervision to ensure the rate of load increase does not out pace the ability of the damaged bone to repair itself. Skilled sports physiotherapists can assist.

**Return to full activity** – Ultimately full activity can be resumed with ongoing modification as above to ensure maintenance of bone health.

In elite athletes sometimes repeat MRI is used at various stages, to ensure the most accurate information is available to guide transition through the stages as quickly and safely as possible. Most people can be managed clinically or with a single repeat xray to ensure resolution.

Rarely, difficult cases that don’t respond to the Four R’s may need an operation such as an intramedullary nail. The Four R’s are then still required to resolve the issue.

## Why does it take so long to recover?

Stress fractures do not occur in healthy bone.

**Fracture behaviour in previously normal bone** - If you take a hammer and whack your arm hard enough just once, the previously healthy bone will break and **it will usually heal in 4-8 weeks** (depending on your age and general health).

**Fractures in previously stressed bone** - if you bang your other arm for many weeks until the bone becomes irritable and swells, the healing processes in that bone will cease to function well. If you then whack that bone with a hammer and snap it, **you also have to factor in how long it will take for the bone healing mechanisms to be restored before healing can begin**. Training does not help this injury in the way it does other injury types – training can make it much worse! Rest and also diet can be key factors in how quickly it takes for your recovery.

**Your sports doctor and physiotherapist can devise a program that helps you get back to full activity as fast and safely as possible**. Sometimes there are also specific treatments, such as pneumatic lower limb braces for tibia stress fractures, that may subtly improve healing times.

Finally - **don't ignore pain as if it is a badge of honour**. You must learn to differentiate normal training pain from injury pain – ask your friendly sports doctor today.