

footwear MODIFICATION

There are many different causes of running injuries. There are also many different forms of treatment available to cure any injury or prevent it from occurring again. What is important is to be able to accurately diagnose the actual injury and the contributing factors that caused it.

Your shoes can be a direct or contributing factor to your injury. This can happen if they are too old and worn, do not fit properly or do not suit your biomechanics. In some of these situations footwear modification may be a treatment option.

When footwear modification is needed

Footwear modification may be needed when other treatments have not worked. This can be when: maximum orthotic control is insufficient; no shoe can be found to suit your specific needs; to accommodate unusual fit requirements; or when asymmetrical biomechanics exist between feet.

Midsole modifications

- **Full length lifts.** Some runners have a leg length discrepancy (LLD). That is one leg is longer than the other. It is important to identify if it is an actual structural difference in the length of the bones or it is a functional difference caused by a temporary muscular or postural imbalance. Building up a functional LLD will reinforce the asymmetry and make it harder to correct. A structural LLD may be successfully compensated for by the runner. However a full length lift can be added underneath the insole in the shoe from 3mm to 5mm thick. Heel lifts are not effective as a correction in a LLD for a runner as they only work when the heel is on the ground and not during the critical phase of propulsion. In more severe LLD cases a lift can be inserted into the midsole of the shoe itself.
- **Heel lifts.** Ankle equinus occurs when there is inadequate flexion at the ankle. In heel strikers this can cause excess strain to the Achilles and calf and increased collapse of the foot during mid-stance. One way of compensating for this problem is to be a mid-foot striker rather than a heel striker. Putting in heel lifts for a mid-foot striker will cause premature strike, slapping and increased injury risk.
- **Rocker soles.** Slapping on forefoot loading is a major injury risk for runners. It causes a shock wave to travel up the front of your shin causing trauma and stress. It is usually caused by weakened and spasming muscles at the front of your lower leg. The way to avoid this is to find a shoe that is quiet when you are running. Some people slap in every shoe so an addition to the central portion of the midsole will facilitate a rocking action and stop the slapping.
- **Adjust arch profile.** The midsole of current shoes is not flat. It is molded up around the edges of the foot to add support and control. This can cause blistering or pain especially in the arch if the midsole shape does not match the foot shape. Modification is simply a matter

of taking a wedge out of the midsole at the offending area. This instant fix can save a new pair of \$200 runners which are fine except for the fit.

- **Other.** There are many other modifications that can be done to the midsole including adding wedges in the heels or forefoot to tip the foot in or out. The midsole can be modified to change the amount or location of stability in the shoe. Excessive flaring of the midsole can also be ground off to improve function.

Upper modifications

Most upper modifications are to improve the fit of the shoe. It may be because something on the shoe is pressing on a prominence of your foot.

- **Remove support strapping.** This can be releasing stitching over a bunion or even to completely remove the offending strap. Most of the straps on the upper are for cosmetic rather than functional reasons so it is not a problem to remove them.
- **Cut heel tab.** Heel tabs may dig into your Achilles or ankle bones. Two little cuts either side on the top of the heel counter can immediately relieve the pressure.
- **Add or remove lace eyelets.** The simplest way to change the fit in the upper is to change the way you lace your shoes. That can be by skipping a lace and changing where the laces dig into the top of your foot.
- **Shoe fillers and pads.** By adding felt to the inside of the shoe you can offload an injured tissue and shift pressure to change biomechanics.

Insole modifications and orthotics

Orthotics are a form of footwear modification where you replace the insole that came with the shoe with a new insole which has been created with your specific individual needs in mind. As a diagnostic step the prescription elements for

What modification involves

Modification usually consists of removal of some part of the shoe or addition of a new material. It can be as simple as releasing stitching or as complex as replacing a large part of the midsole.

an orthotic can be added underneath the insole of the shoe to test whether the prescription will work. These additions can be made from felt which lasts a few weeks or EVA which can last the life of the shoe. The advantage of having an orthotic is that it will customise the shoe to the whole shape of your foot rather than just having the elements needed in a prescription.

Outsole

The outsole is the part of the shoe least frequently needing modification. It usually involves grinding off a bit of the outsole that is causing excessive pressure. It may involve reducing traction where it is not needed. The whole outsole can be replaced in some cases.

When modification is needed

There are a few key points to consider when deciding if footwear modification is needed. Do not modify old worn out shoes. It would be better to buy a new shoe and modify that if it is still necessary. If the shoe is too old to run in safely then modification makes no sense. Modify minor aggravating factors only or to accommodate deformities. It is better to purchase new shoes and get orthotics if you have a significant problem. It is unlikely that modification alone will fix a major issue. Modification may be an option when other treatment modalities have failed.

It is important that you see a health practitioner who has had significant experience with footwear and modification for sports shoes. All of our podiatrists and physios at the Intraining Running Centre are runners themselves and have extensive experience working with footwear related running injuries.

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