PREVENTING A CRACK...

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Removing a crack in the foundation is the best way to progress the strength of a structure – not simply by adding additional layers to the structure, but strengthening the foundation before the new construction starts.

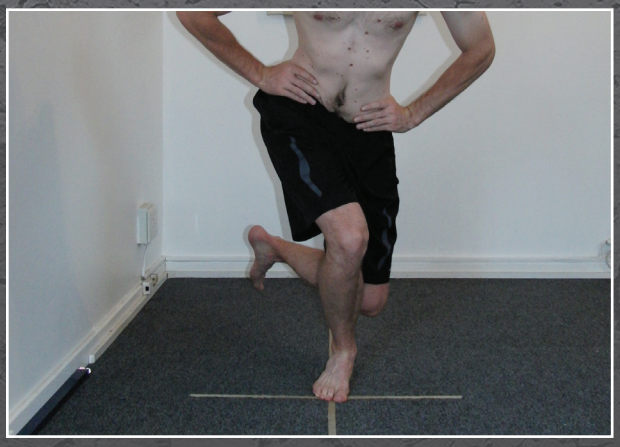
Around 50% of runners get injured every year – and this statistic hasn't changed much in 30 years. So this means that despite obvious technological advances in running shoes and training programmes, not much has progressed. The thing about sport is that it's always much more than just shoes or a training programme. Every runner is a complex and intricate puzzle all on their own. Just to shed some light on this topic I'll explore a few avenues...

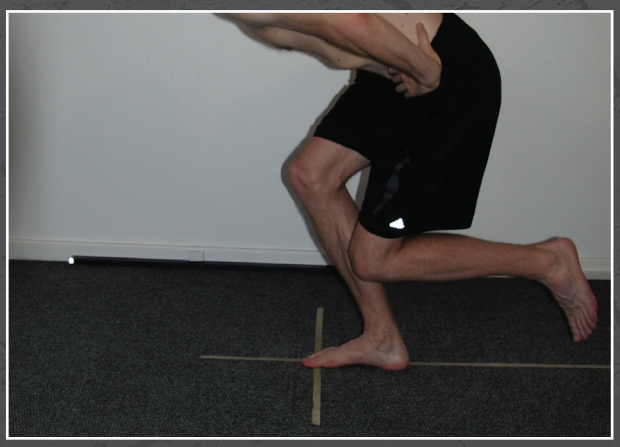
Of those runners that do get injured, approximately half of them will develop knee injuries. And ironically enough, the high incidence of knee injuries rarely has anything to do with the knee itself. It's not that simple. The knee is part of a kinetic chain that is greatly affected by the linked segments both above and below it – so the foot and ankle, and the lumbo-pelvic-hip complex. Various functional movements can be used to help predict knee injuries such as tendonopathies, patellofemoral pain, and even non-contact anterior cruciate ligament injuries. If, when performing a basic movement such as a one leg squat or an overhead squat, there is an inability to maintain the dynamic integrity of the knee (inward collapse/gravitation is often seen), this often highlights that the runner lacks the strength and/or stability to control their knee. This lack of control most often stems from a lack in pelvic stability and the muscles around the hip area. If they cannot control their own body weight during slow controlled movements like squats, the likelihood of injury when running or being more explosive is high.

Have you ever thought of human movement as a puzzle? Imagine puzzle pieces scattered across a table. Now, imagine a completed puzzle. This helps athletes understand terms such as human movement, function and dysfunction. Human movement consists of numerous sub-systems (puzzle pieces) to create performance (completed puzzle). If one of the puzzle pieces (sub-systems) is misplaced then the puzzle is incomplete (dysfunction).

The main stabilizer of the leg when an athlete is just standing is the gluteus medius. When they run, they're essentially landing and balancing on one leg hundreds, even thousands of times in a row. If this hip stabilizing muscle is not strong enough, it will not be a good stabilizer, leaving the athlete at a high risk for injury because of the lack

Some examples of poor or dysfunctional functional movement patterns with obvious compensations, which are tell-tale indications of functional focus areas or foundation cracks





of stability extended to the knee in particular. Once the movement of the knee becomes compensatory, many structures throughout the body are placed in compromising positions. Athetes run the way they do because they are weak in certain areas, stronger in others, inflexible in some spots and more flexible in others. Moreover, the way they're built plays a big role in how they run. It's not really about just changing their biomechanics to improve their running and thereby reducing their chance of injury, it's much more of a puzzle. The athlete may need to get a little stronger in one area and more flexible in another. Once this happens, the biomechanics will naturally change and they will once again run pain-free.

It's like a car having poor wheel alignment and/or balancing. As you drive you may feel a bit of a pull or shudder, but are essentially unaware of the uneven wear on the tyres, bearings, joints, etc. In running you wear down in the same way and don't notice until you develop pain or get injured.

Pinpointing what is out of synch and possibly increasing injury risks takes an experienced eye and the right tools, and is often difficult to do in the mirror or alone. The functional movement analysis (FMA) fills this need and sees athletes perform common athletic movements that are then evaluated on the quality of execution. Symmetry is examined (both sides of the body should be equally strong with equal ranges of motion) as well as functional limitations caused by musculoskeletal weakness, strength imbalances and lack of mobility. The less quality of movement seen in the FMA, the more potential there is for injury, even if no pain is present.

Numerous researchers (especially based on football – a predominantly lower body sport) have shown that athletes who perform poorly in the FMA are significantly more predisposed to injury. And due to subconscious compensatory movement patterns they often cause microtrauma within the musculoskeletal system. The effects of this repetitive microtrauma include overuse injuries which are most often initially ignored as the athlete is able to work through them despite their symptoms. This often then develops into more intense pain and serious injury. Although a history of previous injury is usually considered a strong predictor of future injury, it is possible that a significant emphasis on lower extremity strength and neuromuscular control can be employed in the rehabilitation of subjects post injury, and that such training may have a positive impact on their FMA results. So start at the bottom and work upwards; the better the foundation in place, the more potential for maximizing strengths and minimizing injury risks