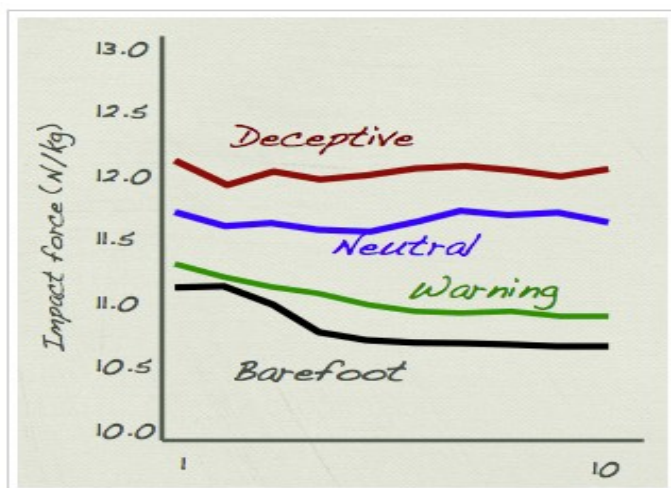


Foot strike impact forces

Two scientists did an interesting study in 1997 with 15 healthy male subjects. They set up a force measuring platform for 4 sets of measurements. In one set the platform was bare (Barefoot) and in the other three it was covered with a material used in the midsole of running shoes. The material was the same in each set of measurements, but the group was told in one trial (Deceptive) that it was the very best state-of-the-art cushioning designed to minimise injury. Fake information was shown to the group (graphs, endorsements from athletes) “proving” the injury minimisation of the material. In another trial (Warning) the material was described as the same as that used in cheap shoes, responsible for a range of injuries. No information was given about the material in a fourth trial (Neutral). Impact forces were recorded for 10 footfalls for each person stepping down bare foot from a 4.5cm perch to the surface.



Robbins S, Waked E, Hazard of deceptive advertising of athletic footwear, Br J Sports Med, Dec, 1997

In effect, the scientists were measuring how belief about cushioning affected impact force. When the subjects thought that they were landing on high-tech cushioning material, impact forces were actually higher than when they thought the material was cheap and ineffective. More interesting was the fact that the impact force decreased as the subjects repeated the test in the Barefoot and Warning trials, a learning effect not recorded in the Deceptive and Neutral trials. The implication is that the body can anticipate impact forces and adjust the foot/leg structures to minimise them

Running shoe manufacturers have added various types and structures of material to the soles of shoes, designed to absorb impact forces, but does wearing these “cushioned” shoes protect you from injury? Apparently not if the shoe construction reduces the natural shock absorption abilities of the foot. This could be an argument for barefoot running, but there is a catch. To provide bare foot cushioning, the muscles in the foot and leg have to work harder. The landing position of the foot is more towards the forefoot, the ankle more plantar flexed (heel raised), the knee more flexed. This places a greater load on the calf muscles and achilles tendon. Gradual transition to light weight, “minimalist” shoes may provide a compromise solution.



Lightweight shoes such as the Saucony Kinvara (218gm) and even more minimalist Asics Piranha (132gm) (most brands have similar models) are now available. This style of shoe also has a lower heel to forefoot drop (4mm in the case of the Kinvara), designed to move footstrike towards the forefoot. These shoes may not be suitable for heavier runners or others with specific problems. They have the disadvantage that, although they cost about as much as other running shoes, they generally will not last as long and the thinner soles offer less protection on rough surfaces.