



Muscle control shoes

You may have been exposed to the marketing of a new type of running shoe that does not fit into the standard categories of motion control, shock absorption and a neutral shoe. Do these weird shoes have any merit?

The modern running shoe has evolved in the last 50 years. In the sixties there were two companies and there was only one single shoe design. Then in the seventies a new shoe design distinguished between sprinters and distance runners. Later distance running shoes began distinguishing between motion control, shock absorption and a neutral shoe. Jay Dicharry, a Physical Therapist colleague, coined a term for a new developing classification of running shoes called "muscle control shoes". A growing number of shoe manufactures are producing shoes purported to stimulate greater use of muscles.

In the mid 1980's researchers suggested that barefoot running might be more economical and might also result in a better use of muscles in the feet and legs, compared to running in shoes.

The rationale is that running shoes which stabilize and cushion the foot act much like a cast, crutch or brace. When a fractured bone is immobilized in a cast, the muscles shrivel up and become weak. Perhaps the extensive cushioning and support that these shoes provide, dampens the sensory input to the foot. If the foot does not feel the pebble or uneven surface, then the foot and leg does not need to contract the muscles to avoid the pain or reverse the instability. The shoes take over certain functions so some of the muscles do not have to work the way they normally would if you were barefoot.

Shoes that are designed to simulate muscles as if you were barefoot can be classified as muscle control shoes. Examples include Nike Free shoe, Five Finger Shoe, Puma H Street and the Newton Shoe. I think the trendy Croc sandals could be considered muscle control shoes, as there is no support and very little cushioning.



A second type of muscle control shoe is one with a rocker bottom type sole, which is designed to be unstable. The biomechanical effect of a rocker type sole is quite different than a traditional flat sole running shoe. Research has shown rocker bottom type sole results in significantly more muscle activity, compared to a standard flat sole shoe. Examples of rocker type shoe are the MBT shoe (Masai Barefoot Technology) and Chung Shi shoe. In my experience I would also consider Dansko shoes, a non-running shoe, as a relatively unstable shoe. Of course a woman's high heel shoe, with a narrow heel base, is an example of an unstable shoe. The wooden clog sandal was marketed as a way to make ladies' calf muscles appear shapelier, because in order to keep the sandals on the feet, it requires gripping the sandal with toe muscles.

There is a small body of evidence that these type of shoes result in greater muscle activity. Studies have shown that the Nike Free shoe has led to significant increases in intrinsic foot muscle strengthening, compared to motion control shoes. Studies which measured the electrical activity in muscles in the leg, show that they are greater in individuals using the MBT shoe compared to a traditional shoe.

I have not personally used any muscle control running shoe, so what follows is an opinion based on reading the small amount of research evidence available, the rationale provided by shoe manufactures and my understanding of biomechanics of the lower extremity. Although I suppose that I have used muscle control running shoes, when I continue to run in shoes for longer than the recommended usage and therefore the shoes would be considered worn out.

As a clinician my challenge is to determine which individual might benefit from using a muscle control shoe?

I think a young runner who has not already experienced injuries or individuals who thrive on going barefoot during the summer months, might be good candidates for muscle control shoes. Assuming that greater intrinsic foot muscle strength can help prevent injury, individuals currently using motion control shoes who have the potential to strengthen foot

muscle strength, would benefit from using muscle control shoes. I think weak intrinsic foot muscles are a significant factor in the development of plantar fasciitis.

The sub type muscle control shoe that has a rocker type sole is well suited for individuals who have limited motion in the big toe or ankle, that is secondary to arthritis, injuries or previous surgeries.

Another challenge is switching from a motion control type shoe to a muscle control type shoe. Logically, the long term use of a motion control type shoe has likely resulted in some foot muscle weakness, and a muscle control type shoe demands a great deal of muscle strength and endurance. Because this class of shoe is so new, there is little information or experience regarding the most appropriate method of switching from a motion control shoe to muscle control shoe. I believe that common sense and the common principals of muscle strength training, such as appropriate progression of stress, should be followed.

Whether the increased muscle activity and intrinsic foot muscle strength purported to occur as a result of muscle control shoes will result in faster running or less injury, is yet to be studied. Evidence supporting the use of muscle control shoes is very limited. If you elect to use a muscle control shoe you need to gather your own data. Keep notations in you log of any injuries, your race times, muscle strength/shape and whether you think this type of shoe is the best thing since sliced bread.