

ASK THE EXPERT: COMPRESSION



Our question-and-answer series with prominent textile academics continues with Dr Marcus McDonald, from RMIT University in Victoria, Australia, answering questions about textile-based compression technology. His expertise is as a chiropractor, which he brings to bear in teaching courses such as physiological therapeutics at the university's Bundoora West campus 20 kilometres north of Melbourne.

Pressure points

Athletes of all levels of ability are increasingly using tapes, braces, supports and other textile-based adjunctive therapies to maximise muscle power and prevent injuries.

Question: What are the key criteria to look for in choosing textile-based bracing and supports?

Answer: The most important criteria is not the garment at all, it's the wearer. None of the garments will 'fix' faulty posture or 'correct' bad bio-mechanics. The garment may assist in the short term to compensate for some dysfunctional movement patterns or fatigued kinetic chains but it won't be a good long-term solution. It may even, if worn without the proper work and postural or dynamic rehab, cause an increase in symptoms. If wearers are increasing the efficiency

and function of their bodies, garments that support correct posture will help them perform for longer in competitions in which rest is not practical, such as hiking, combat situations or even long office days. Garments such as the Intelliskin range aim to allow freedom of movement while offering support in an ideal posture. This quality is highly desirable. If a garment was to claim to 'hold' the wearer in a particular position and thus decrease movement it would be less desirable.

Q: Muscle vibration reduction is one of the secondary effects attributed to compression apparel, it is said to reduce a source of discomfort as well as the risk of injury. What role does muscle vibration play in common athletic pains and injuries and how important is it to address muscle vibration in our efforts to reduce the risk of injury?

Rugby athletes are enthusiastic exponents of using compression clothing and tapes. The technology can help muscle recovery and keep the body in the right position, but athletes also have to discipline themselves to move and even stand correctly.

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A: What is clear from the research is that compression garments, regardless of whether they are posture-correcting, aid in recovery and ease soreness. This seems mainly due to the compression they provide. Fluids and waste products moving out of an area of the body are assisted by the movement of muscles and joints. Demand for movement of these waste products is high and there is a point at which the body cannot move them out of the area fast enough. When wearing compression garments there is an increase in hydrostatic forces that squeeze the fluids and waste products out of the area in question. This is the same sort of function that compression socks have in preventing deep vein thrombosis on long flights. There is some elastic assistance the garment gives, too. This is especially important in eccentric contraction at the end of a phase of activity, say for example in the hamstrings while running.

Q: Some of the early benefits promoted for compression garments, especially for runners, were to prevent muscle fatigue and to allow more of the athlete's energy to be focused on forward propulsion. Why do we still see elite athletes run in baggy shorts?

A: Again, garments may support and enhance certain movement patterns or postures but they will not create them. It is the job of the true athlete to control movement at an optimal level while avoiding injury. Also, what people wear for athletics and physical pursuits quite often comes down to their beliefs and tastes, or to the accessibility of equipment to the athlete.

Q: What role does posture play in common athletic pains and injuries and how important is it in reducing the risk of injury? Is the pelvis area a critical element of correct posture for runners?

A: Posture is absolutely integral to the health and performance of not only athletes but of all people. For example, with an ideal static standing pelvic posture, the psoas muscle is 'quiet'. That is, it has very little activity or resting tension. With a slight forward pelvic tilt the psoas muscle is activated even if the person is not moving. This may cause the lumbar spine, hips and pelvis to become restricted or work inefficiently, quite possibly without the presence of back pain. Without efficient bio-mechanics the muscles are hardly going to be able to function at their optimum level or without injury. Shoulder and spinal (including neck) bio-mechanics and posture will have a profound impact on breathing and the body's ability to coordinate its movement patterns (proprioception). In relation to injury, these often happen at the end of range of motion or at full stretch. If a person has a rounded shoulder posture then, compared to an ideal posture, the amount the arm can stretch back

before it is near end range is drastically reduced. Thus with round shoulders injury is more likely. Garments that support a closer-to-ideal posture will help avoid these occurrences as well as improving the efficiency of biomechanics and, thus, muscle activity.

Q: Activating neuronal receptors in the body (by applying additional pressure on specific points of the body, such as the back of the knees) could be a way to speed up muscle reactions and hence performance. In your opinion, could this be an interesting direction for performance apparel manufacturers to investigate?

A: Garments (and certain tapes) that support ideal and biomechanically efficient postures will normalise, or at least assist, in normalising the afferent (sensory/ascending) information coming from all over the body. It is this information that the nervous system and brain use to co-ordinate movement. The most important areas in the body concerning this afferent information and proprioception are the very top and very bottom of the spine. It is also these areas that are placed at the most risk from poor posture. So it is more beneficial to make sure the body as a whole is working efficiently before concerning oneself with the detail. Again, this is where garments such as the Intelliskin range have their greatest effect.

Q: Why are developments with dynamic tape more recent? What are the principles that dictate how and exactly where athletes should wear the tapes?

A: Dynamic tapes such as Rocktape and SpiderTech and others that are emerging, serve a range of functions, from proprioceptive or afferent-ascending feedback, through slowing down eccentric contraction at end-range and increasing snap-back to help with the endurance of muscle contraction. The use of dynamic tapes should be used where the wearer needs assistance and control in motion, not restriction, as is achieved using rigid tape. Applications too are varied depending on what it is the wearer wants to achieve. It can be used to assist where muscles are dysfunctional by being either too tight or not tight enough. These might be described as 'problem' muscles that have not responded to manual care or at least not as well as the person would have liked. A person may choose to tape for assistance with movement patterns, which will be because of muscle dysfunction; here the movement is the focus, not an individual muscle. It may be that the person seeks to enhance already good performance. This should be especially useful in endurance events. Snap-back and controlling deceleration at the end-range become important for insuring lasting performance right through the event. 



Taping helps movement patterns, not individual muscles.

SpiderTech