Compression suits provide competitive advantage

June 27 2011, By Russell Dougan

Full body compression suits aid athletes.

To be the best, athletes are always searching for a competitive edge on and off the playing field. A new study by Professor of Kinesiology William Kraemer of the Neag School of Education shows that wearing a

full-body compression suit is one way athletes can improve their performance even while they rest.

Known as "recovery wear," these high-tech garments are engineered to contour to the body using strategic compression in order to help tired and worn muscles heal more quickly.
The garments are specifically designed to hug areas of soft tissue (quadriceps, calf muscles, and upper body muscles) that can be damaged during a rigorous workout or athletic activity. The flexible, tight-fitting fabric helps repair soft tissues by immobilizing muscle fibers to decrease swelling and regulate fluid buildup inside the body. Researchers say that such stabilization of muscles and joints rejuvenates the body better than traditional methods involving icing and rest alone.

The garments work best when they are worn directly after exercise. In this study subjects wore the suits for 24 hours after a workout. Since the suits are both lightweight and comfortable, it is possible to wear them under clothing and while sleeping, when the body does most of its repairing.

“Our bodies are always in repair mode,” Kraemer says “We are constantly repairing and remolding all the time, especially after a workout.”

One commercial line of recovery wear – the Under Armour Recharge whole body compression suit – is constructed to produce needed compression and to allow long term wear with comfort. It is made of 75% nylon and 25% spandex.

All compressive garments are not the same and it is important there is enough spandex or Lycra in the garment if it is to be more than just a fashion statement, Kraemer says. Many people have worn garments that are tight and contain spandex, such as the workout clothes of the 1980’s,

but that clothing had low amounts of spandex or Lycra and was worn more for fashion, than for performance and/or recovery purposes, Kraemer says.

Latest Technology

The whole-body compression suit represents one of the latest applications of compression technology in sport and exercise. Early applications of the technology often involved athletic trainers taping or bandaging for example, an injured muscle or sprained ankle. This was to help support the weakened tissue. This same principle now is being used to assist healthy athletes with muscle recovery.

Kraemer began looking into the benefits of garment compression and their effect on athlete performance in the late 1980's when he was a professor at Penn State University. His research has shown that compression technology is helpful in aiding athletes' performance under fatiguing conditions of all types. It also helps athletes improve their stability and reduces the oscillatory movement of muscle when impacting the ground during running and jumping.

"We found that when part of your body hits the ground while wearing a compression garment, there would be a reduction in the oscillation of the muscles, which resulted in lower amounts of muscle damage," says Kraemer. "Furthermore, our research in the area of compression and soft tissue damage helped us develop this idea of using compression for recovery purposes after typical hard workouts or competition. We knew it would help recovery from dramatic eccentric muscle injury but were less sure about its potential benefits in relation to the normal workouts athletes perform all of the time. That theoretical concept had not yet been fully explored."

Kraemer's research also served as the inspiration for the popular Under

Armour sports performance apparel company. While giving a lecture on his compression research in 1995, one of those in attendance was Kevin Plank, who would go on to launch Under Armour. Plank was a student athlete at the University of Maryland at the time, where he played football and had the idea of using compression to create a tight fitting t-shirt a player could wear under shoulder pads that would not collect sweat and weigh the player down.

As the story goes, Plank found Kraemer's research on compression technology very interesting; it was something that he had been looking for, an edge in his game. He also found it to be a potential business opportunity. Plank began buying lingerie material and making compression shirts for athletes, all from his grandmother's basement. This small business idea turned into Under Armour, which is today an industry leader in athletic apparel and considered the pioneer of compression clothing.

Under Armour became the first company to use Kraemer's theory on the value of compression for workout recovery and supported a grant to test its efficacy.

"Dr. Kraemer is a leader in innovation and one of the world's top compression garment experts," says Plank, founder and chief executive officer of Under Armour. "It's an honor to continue to work with him to develop cutting-edge technologies like the UnderArmour Recharge suits that are designed to help athletes recover faster."

Follow Up To Resistance Training

In his latest study, Kraemer recruited 11 highly resistance-trained women and nine highly-resistance trained men. The participants were asked to perform an intense resistance training workout regimen that included back squats, bench press, stationary lunge, dead lift, bicep

curls, sit-ups, and high pulls. They were closely monitored during the workouts.
After the workouts, the participants in the study were required to wear a whole-body compression garment for 24 hours. The study involved extensive controls for diet, hydration and activity.

“This research was under highly controlled conditions,” says Kraemer. “We tried to control everything so that any treatment effect of an intervention could be seen. Looking for the efficacy of a treatment requires a highly controlled laboratory environment.”

The students were evaluated after the 24-hour period measuring a host of different physical and biological variables. Questionnaires, ultrasounds, blood samples and measurements of muscle circumference were taken and compared to the results obtained prior to the experiment. These data were then compared with their own control conditions where they did not wear a full-body compression recovery suit. The study found that, “in both men and women, compressive garments influenced positive effects on recovery in various physiological and performance profiles.”

Ultrasounds taken to determine swelling were significantly lower in the thigh of participants who used the compression garment compared to their control conditions of no suit, according to the study results. Also, vitality rating, fatigue rating, and generalized muscle soreness were all lower than that of the control condition. Overall, the study said, the suit performed to its potential in testing and the findings proved a more rapid recovery of selected psychological, perceptual, physiological, and performance variables.

Provided by University of Connecticut