

# Compression clothing and athletic performance -- functional or fad?

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Two Indiana University studies examined the influence of compression garments on athletic performance and both found little influence: Abigail Laymon, researcher in the Department of Kinesiology, is presenting "Lower Leg Compression Sleeves: Influence on Running Mechanics and Economy in Highly Trained Distance Runners;" Nathan Eckert, a human performance doctoral student in the Department of Kinesiology, is presenting "Limb Compression Does Not Alter Jump Height Variability During The Vertical Jump."

## LOWER LEG COMPRESSION SLEEVES

Laymon's study found that lower leg compression garments did not impact a runner's [oxygen consumption](#), which meant there was no change in running economy or efficiency. The study also found that calf compression garments did not have an effect on running mechanics.

Laymon examined the impact a lower leg compression garment made by Zensah -- basically, a more compressive tall sock that begins just above the ankle and goes a little below the knee -- had on a runner's running mechanics and running economy. Lower leg compression garments have gained popularity in the professional field of distance running, despite a lack of solid research supporting their use.

"Distance [runners](#) may try them out initially, because they see other runners using them with success," Laymon said. "Since some runners are

somewhat superstitious, they may continue to use them if they happen to have a good race and attribute it to the compression."

### **About the study:**

- Sixteen highly trained male distance runners were the subjects of this study. Each subject had to complete two 12-minute running tests -- one with lower leg compression and one without. During each test, the subjects had to run at three speeds: a 6.55 minute per mile pace, a 6 minute per mile pace, and a 5.21 per mile pace. During the tests, the runners spent four minutes at each speed.
- Running economy is the amount of energy one expends on a given workload. Mechanics and economy are linked -- the more unnecessary motion that is exerted while running will usually result in a greater waste of energy resulting in a worse economy. To study a runner's economy, Laymon measured the runner's oxygen consumption at three different running speeds. Lower oxygen consumption indicated better economy. The subjects ran at each speed with and without lower leg compression. However, the study found that the runners' economy did not change when wearing the garment.
- The runners' mechanics were not affected as well. Laymon found no differences in ground contact time, stride length or stride frequency.

"Highly trained runners have an ingrained running style, so changing it is difficult," Laymon said. "Typically they have already selected the best running style for themselves. An intervention like compression may not affect them, especially a commercially available grade of compression

that is slightly more compressive than a sock."

Although overall the study found that the compression garment had no effect on running mechanics and economy, there was some variation. Four subjects had an average of greater than one percent increase in oxygen consumption -- their economy worsened -- while wearing the compression garment. However, four other subjects experienced a greater than one percent decrease in oxygen consumption -- their economy improved -- while wearing the compression garment. Laymon had her subjects complete a subjective questionnaire about their feelings toward compression garments before completing their tests. It turned out that the subjects who experienced improvement in their economy were more likely to have a favorable attitude toward compressive wear and believed that by wearing the compressive garment their racing would improve.

"Overall, with these compressive sleeves and the level of compression that they exert, they don't seem to really do much," Laymon said.

"However, there may be a psychological component to compression's effects. Maybe if you have this positive feeling about it and you like them then it may work for you. It is a very individual response."

The study, "Lower Leg Compression Sleeves: Influence on Running Mechanics and Economy in Highly Trained Distance Runners" will be presented at 10:45 a.m. on Wednesday, June 2, during the Human Performance I session. Co-authors include Robert F. Chapman, Joel M. Stager, S. Lee Hong and Jeanne D. Johnston, all faculty members in the Department of Kinesiology in IU's School of Health, Physical Education and Recreation.

## **UPPER THIGH COMPRESSION GARMENTS**

Eckert's study found that compression garments -- compressing

specifically the upper thigh -- did not improve one's jump height during the vertical jump. Many compression garments come with manufacture claims that their product will increase a consumer's performance.

"I didn't buy into that," he said. "To think there is something you can just put on and immediately you are better at what you do, just seemed too good to be true."

The vertical jump was used in the study, because it is an assessment that correlates to other anaerobic measures such as sprints. If someone wears a compressive short while performing a vertical jump and they don't jump any higher, then that suggests that they will not perform better in other anaerobic events, Eckert said.

Eckert said that he hopes from this study, consumers will be weary before they purchase a compression garment based off a company's manufacture claims.

"Consumers need to keep in mind that this is a business, and that they are trying to sell you their product," Eckert said.

However, consumers are not the only ones that believe these claims of performance improvement. Swimming's governing body, Federation Internationale De Natation, has banned full body compression swimsuits from being worn by male swimmers in the 2012 Olympics.

### **More about the study:**

- The study involved 25 males who were around the age of 23 years old and weighed between 160 to 190 pounds. The subjects completed vertical jumps while wearing the Speedo LZR RACER, a compression garment that covers a person from their

waste to the knee. Participants had to wear three different levels of compression: one made to fit the individual, one that was a size smaller and one that was a size larger.

- The study examined if there was a difference in the height of the participants' vertical jumps depending on the level of compression a participant was wearing. Participants had to wear each of the three different levels of compression and they performed the vertical jump while wearing each one. Their vertical jumps were then measured to see if their performance had changed in any way. "We looked at various different angles to see if the variability changed and nothing significant happened," Eckert said. "This basically states that at all three different levels of compression did absolutely nothing for them."

The study "Limb Compression Does Not Alter Jump Height Variability During The Vertical Jump," is being presented during the D-34-Neural Control of Movement and Balance session at 2 p.m. on Thursday, June 3.

Co-authors include David Koceja, Timothy Mickleborough and Joel Stager, faculty members in the Department of [Kinesiology](#) in IU's School of Health, Physical Education and Recreation.

Provided by Indiana University

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