

## Study uncovers potential key to preventing back pain in runners

January 3 2018, by Alexis Shaw

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Kayla Borchers performs a plank on a Bosu ball. Stabilizing your body on an unstable surface is an effective way to strengthen the deep core muscles. New research finds that these muscles are commonly weak in runners, which often causes back pain. Credit: The Ohio State University Wexner Medical Center

A new study from The Ohio State University Wexner Medical Center examines what may cause chronic back pain in runners and the exercises to help prevent it.

The study, published in the *Journal of Biomechanics*, suggests that runners with weak deep core muscles are at higher risk of developing low back pain. And, unfortunately, most people's deep core muscles aren't nearly as strong as they should be.

To examine the role of the superficial and deep core muscles, researchers used motion detection technology and force-measuring floor plates to estimate [muscle](#) movements during activity.

"We measured the dimensions of runners' bodies and how they moved to create a computer model that's specific to that person. That allows us to examine how every bone moves and how much pressure is put on each joint," said Ajit Chaudhari, associate professor of physical therapy and biomedical engineering at Ohio State University Wexner Medical Center, who led the study. "We can then use that simulation to virtually 'turn off' certain muscles and observe how the rest of the body compensates."

What they found is that weak deep core muscles force more superficial muscles like the abs to work harder and reach fatigue faster. When those superficial muscles are doing the work the deep core should be doing, there are often painful consequences.

"When your deep core is weak, your body is able to compensate in a way that allows you to essentially run the same way," Chaudhari said. "But that increases the load on your spine in a way that may lead to low back pain."

Experts say it's common for even well-conditioned athletes to neglect

their deep core, and there is a lot of misinformation online and in fitness magazines about core strength. Traditional ab exercises with a large range of motion, such as sit-ups or back extensions, will not give you the strong core needed to be a better [runner](#).

Instead, Chaudhari says exercises such as planks that focus on stabilizing the core, especially on unstable surfaces, are what's really going to make you a better runner.

"Working on a six-pack and trying to become a better runner is definitely not the same thing. If you look at great runners, they don't typically have a six-pack but their muscles are very fit," Chaudhari said. "Static exercises that force you to fire your core and hold your body in place are what's really going to make you a better runner."

**More information:** Margaret E. Raabe et al. Biomechanical consequences of running with deep core muscle weakness, *Journal of Biomechanics* (2017). [DOI: 10.1016/j.jbiomech.2017.11.037](https://doi.org/10.1016/j.jbiomech.2017.11.037)

Provided by The Ohio State University

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