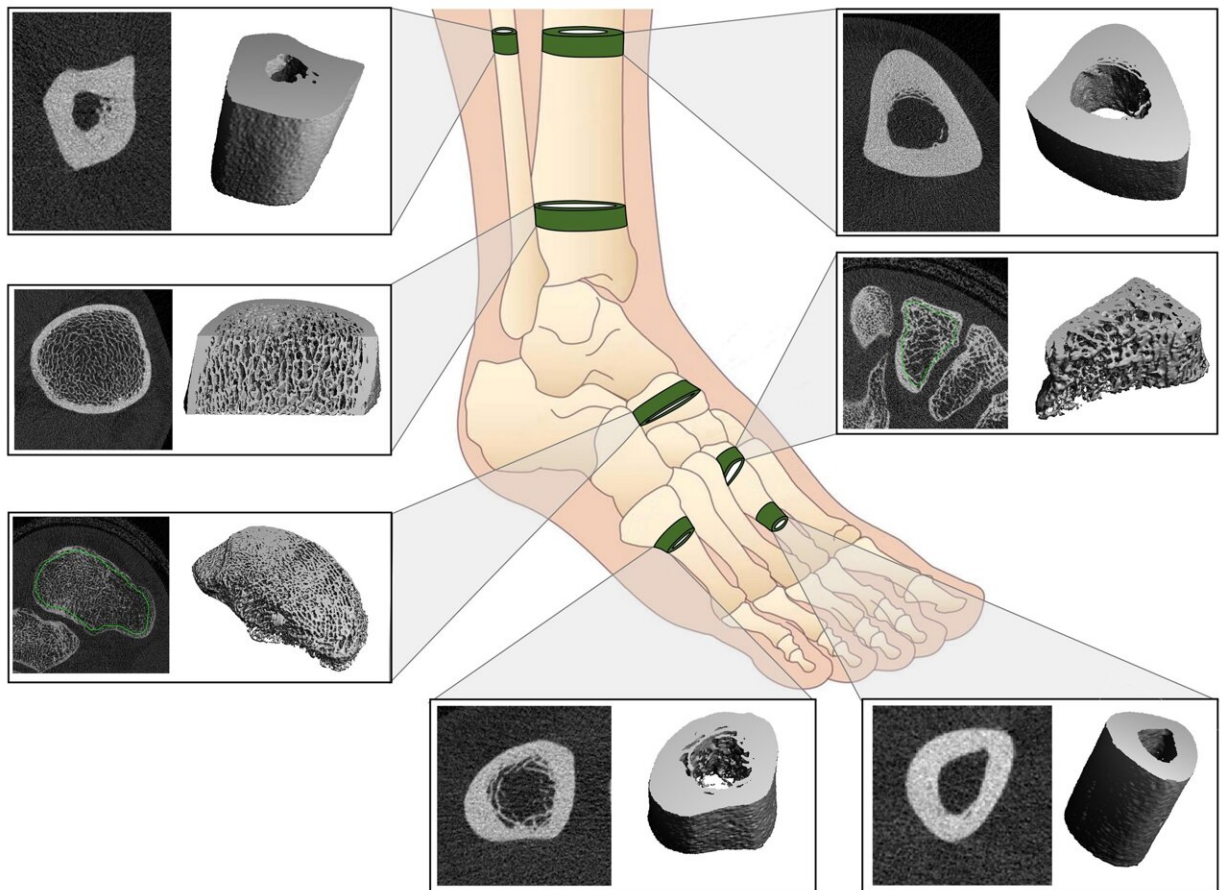


Sports like soccer, basketball better for young athletes' bone health than running alone

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Researchers used high-resolution imaging to assess bone strength in areas of the shin bone and foot where bone stress injuries frequently occur in runners. Credit: Stuart Warden

Young athletes who participate in multidirectional sports, instead of specializing in a unidirectional sport like running, can build stronger bones that may be at less risk for bone injuries as adults, according to a new study from Indiana University researchers.

Published in *Medicine & Science in Sports & Exercise*, the study examined Division I and II female cross country runners, who often experience bone stress injuries like stress fractures. The researchers found that athletes who ran and participated in sports that require movement in many directions—such as basketball or soccer—when younger had better bone structure and strength than those who solely ran, swam or cycled.

As a result, the study's findings support recommendations that athletes delay specialization in running and play multi-directional sports when younger to build a more robust skeleton—and potentially prevent bone stress injuries.

"Our data shows that playing multidirectional sports when younger versus specializing in one sport, such as running, decreased a person's bone [injury](#) risk by developing a bigger, stronger skeleton," said Stuart Warden, associate dean for research and Chancellor's Professor in the IU School of Health and Human Sciences at IUPUI.

"There is a common misperception that kids need to specialize in a single sport to succeed at higher levels. However, recent data indicate that athletes who specialize at a young age are at a greater risk of an overuse injury and are less likely to progress to higher levels of competition."

Historically, Warden said, researchers have examined the bone's mass—how much bone a person has—to determine how healthy their skeleton will be through life. But in previous studies, Warden and his

colleagues found that as a person ages, both mass and size are equally important.

In the current study, the researchers used high-resolution imaging to assess the shin bone near the ankle and bones in the feet where bone stress injuries frequently occur in runners. They found that the athletes who participated in both running and multidirectional sports when younger had 10 to 20 percent greater bone strength than athletes who solely ran.

"Our research shows that the runners who played multidirectional sports when younger had stronger bones as collegiate athletes, which puts them at less risk for bone stress injuries including [stress fractures](#)," Warden said. "We want to ensure people have better, stronger bones as they grow, become adolescents and go through life. Specializing in one sport at too young of an age means they are more likely to get injured and not make it at the collegiate and professional levels."

Warden said that anyone who oversees a junior [athlete](#) or team—whether that be parents, coaches or trainers—should think twice about pushing them to specialize in one area too early. To allow for proper growth and development to occur, he recommends [young athletes](#) not specialize until at least their freshman year of high school. For athletes who already play multidirectional sports, he said it is important that they take time off for rest and recovery during the year, which can improve both [bone](#) strength and performance.

Additional authors on the study were Austin Sventeckis, Ph.D. student, and Robyn Fuchs, associate professor, of the IU School of Health and Human Sciences at IUPUI, and Rachel Surowiec of the School of Engineering and Technology at IUPUI.

More information: Stuart J. Warden et al, Enhanced Bone Size,

Microarchitecture, and Strength in Female Runners with a History of Playing Multidirectional Sports, *Medicine & Science in Sports & Exercise* (2022). [DOI: 10.1249/MSS.0000000000003016](https://doi.org/10.1249/MSS.0000000000003016)

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