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What Is Dorsiflexion? Experts Explain Why You Need a Degree of Flexion at the Ankle

Range of motion at the ankle can play a big role in your running mechanics and injury risk.



BY EMILIA BENTON PUBLISHED: APR 7, 2023



Trevor Raab

Picture your running gait. As you land on one foot and drive forward, you need to push off the ground with force and speed. During that push off, your ankle has to flex and that action is known as dorsiflexion.

Dorsiflexion requires mobility at the ankle joint, as well as engagement from the muscles surrounding the joint.

During strength training, you might think more about working your quads and glutes, but your ankles, feet, and calves should also get attention—and that includes

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exactly dorsiflexion is, how to assess your range of motion, and how to improve it, too.

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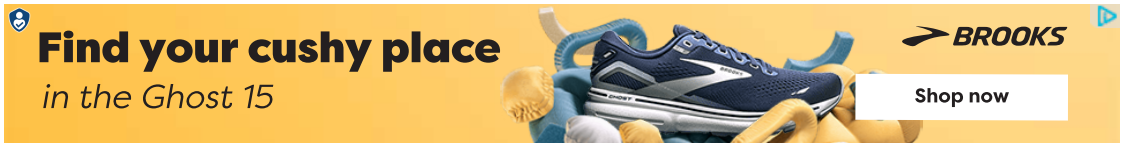
What exactly is dorsiflexion?

Ankle dorsiflexion is the movement of pulling your toes toward your shin, Efren Caballes, D.O., a runner and rehabilitation and sports medicine physician in Boulder, Colorado tells *Runner's World.* This flexion is important to runners during the push-off point of your stride, as well as for the health of the Achilles tendon.

"Ankle dorsiflexion is dynamic," Cabelles explains. The flexion works in tandem with the ankle joint, the muscles of both the shin and the calf, as well as the Achilles tendon.

Dorsiflexion range of motion describes how much the ankle joint is able to flex, Jessica Mena, D.P.T., C.S.C.S., a physical therapist in Los Angeles tells *Runner's World*. For runners, a good range of motion is anywhere from 10 to 20 degrees. Anything less than that is considered sub-par, she says.

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Your ankle naturally dorsiflexes to its maximum range at the mid-support phase of your running gait, Mena explains. This is when the whole foot is in contact with the ground, right before you push off your toes. At this point in your run, your foot, knee, and hip are absorbing the shock of your landing and preparing to push off the ground.

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Why is dorsiflexion important for runners?

"Foot and ankle overall strength and mobility is vital for running," Mena says. "Having a strong and mobile foot and ankle reduces the risk of injuries." Ankle flexibility, especially good dorsiflexion range of motion, is a key component to optimal mechanics and thus performance.

Ankle dorsiflexion matters during all activities, including running, walking, squatting, and jumping, as the ankle and foot provide the foundation for every step you take, Caballes says. Deficits in ankle mobility can result in increased stress to other joints or surrounding tissues, specifically the Achilles tendon and plantar fascia.

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just before the push-off phase of gait," Caballes explains. Good range of motion at the ankle means you can get that leg behind you and propel forward with power, which is even more important as you pick up the speed, he adds.

Without mobility in your ankle, you could also be at risk for injuries like patellofemoral pain syndrome (runner's knee), shin splints, Achilles tendinitis, posterior tibial tendinitis, and plantar fasciitis, Mena adds.

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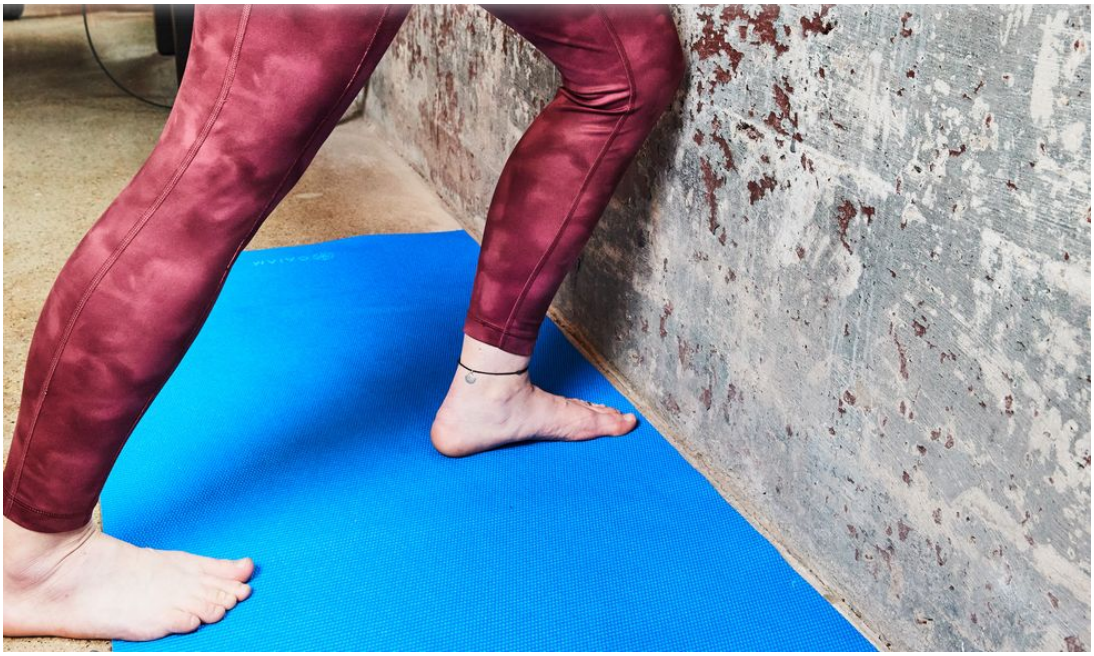
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How can you assess dorsiflexion?

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One way to assess ankle mobility is the "ankle-to-wall test," shown above. Stand in a split stance position with the lead foot 4- to 6 centimeters from the wall. Keep the heel on the ground and lean forward. Try to touch the kneecap to the wall. "If you can touch the kneecap to the wall without collapsing the arch of the foot or lifting the heel off the ground, then you have enough range of motion in the ankle to walk and run comfortably and you're good to go," Cabelles says.

"If your knee is able to touch the wall, scoot back a few centimeters and repeat until you find the exact distance that you can touch the wall before your heel lifts, and then measure that distance with your tape measure and repeat with the other foot," Mena adds. If you can touch your knee to the wall when toes are 5 inches away, that's good dorsiflexion—less than that and you'll want to add the exercises below to your routine to improve mobility.

Another important note: It's likely that each foot will have a different range of motion, and if that's the case, you want to work to lessen the asymmetry.

Cabelles says that if it feels tight in the front of the ankle then this is usually a problem of stiffness in the talocrural, or ankle joint. "[You may] benefit from ankle mobility drills and joint mobilizations," he explains. "Stretching may sometimes irritate the joint in this situation. However, if it feels tight in the back [of the ankle], then this is usually a problem of soft tissue length and this runner would benefit from stretching, foam rolling, and myofascial release of the calf and plantar fascia."

That tightness in the back of the ankle may specifically come from stiff calves, which can pose a problem for runners. "If the large muscles that make up your calf (the

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to compensate, and this can lead to injury," Supna Reilly, D.P.M., a podiatrist in Chicago tells *Runner's World*. "Foam or stick rolling the calves is another way to get those muscles to loosen up."

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What causes poor dorsiflexion?

It's worth your time to take care of your ankles because injuries can lead to further problems with both strength and flexibility in the muscles surrounding that joint. Ankle sprains, Achilles tendon injuries, prior surgery, or lower limb fracture can cause problems with the ankle's ability to dorsiflex.

Another common cause is when, as part of recovery from an injury, runners wear a boot to protect their foot, lower leg, or ankle. If you do wear a boot as part of your rehabilitation, work with your doctor or a physical therapist to restore mobility, which is "paramount," Cabelles says, to recovery and a return to running.

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How can you increase dorsiflexion?

There are a variety of ways to improve ankle dorsiflexion, which all runners should prioritize as part of their training, says Reilly. Below are several exercises to try first, all recommended by the experts.

1. Ankle Joint Glides

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Place a thick ankle belt with a strap (not a resistance or stretchy band) just above the ankle joint. Anchor the other side to something sturdy, such as a couch. Face away from the attachment point with no slack in the belt. Keep the foot flat on the ground. Do 10-15 squats with the band in this position.

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2. Burrito Calf Stretch



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side of the tower. Keep the heel flat and bend the knee to feel a stretch in the calf and arch of the foot. Repeat. Do 10-15 reps.

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3. Heel Walks



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Standing with feet flat on the floor, hip-width apart. Keep the heels on the ground and raise toes up toward shins. Walk forward while keeping the toes lifted off the ground. Walk 5-20 steps. Rest and repeat. Do 5 sets.

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4. Inchworm

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Stand with feet hip-width apart, and begin to roll down vertebrae by vertebrae to touch the ground. Bend the knees as needed. Place hands on the floor and walk them out into a plank position. Walk the feet forward toward the hands, stopping as close to hands as is comfortable. Walk hands back out to plank and repeat. Do 5-10 reps.



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Emilia Benton is a Houston-based freelance writer and editor. In addition to Runner's World, she has contributed health, fitness and wellness content to Women's Health, SELF, Prevention, Healthline, and the Houston Chronicle, among other publications. She is also an 11-time marathoner, a USATF Level 1-certified running coach, and an avid traveler.