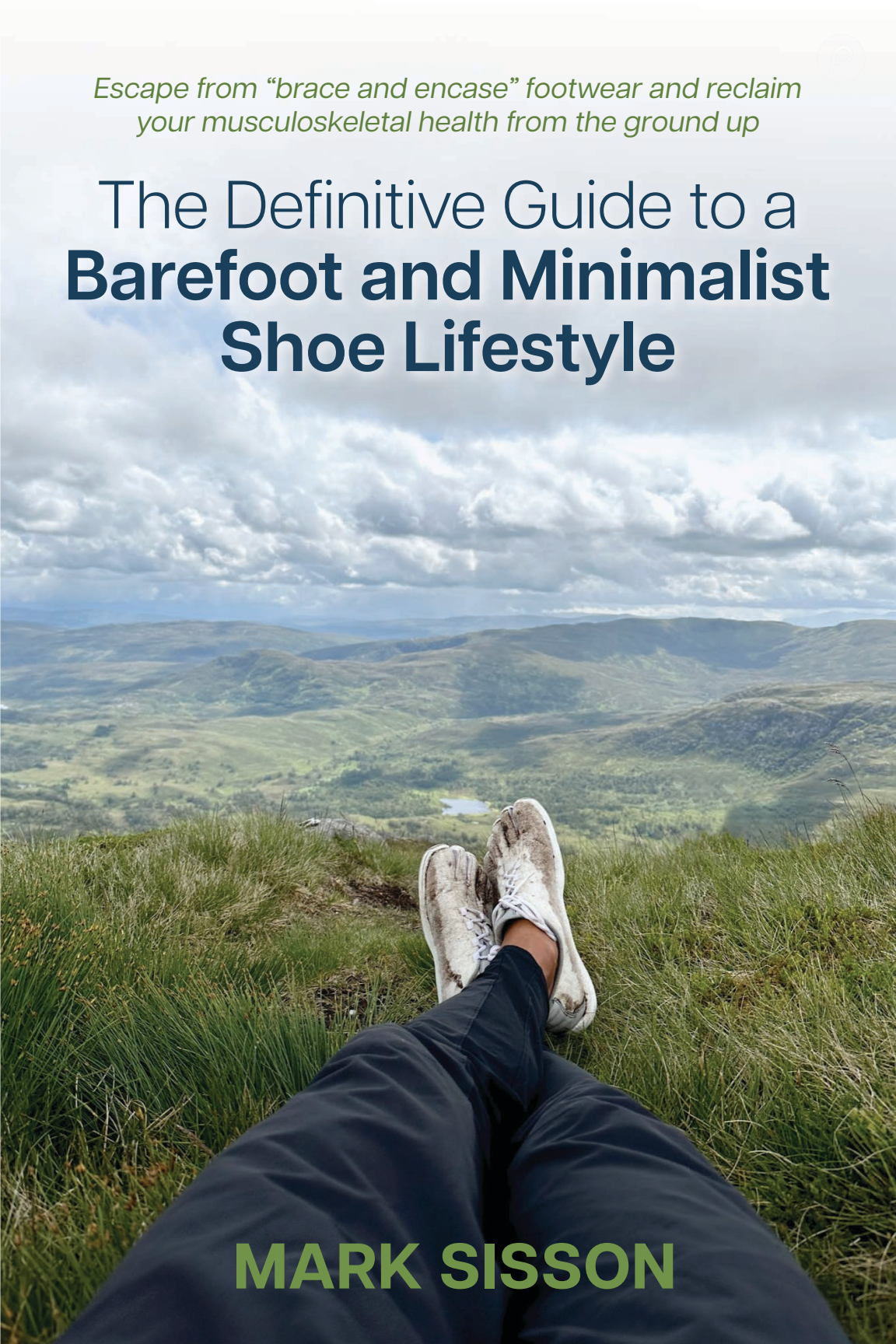
Escape from "brace and encase" footwear and reclaim your musculoskeletal health from the ground up

The Definitive Guide to a **Barefoot and Minimalist Shoe Lifestyle**



MARK SISSON

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THE DEFINITIVE GUIDE TO A **BAREFOOT** AND **MINIMALIST SHOE** LIFESTYLE

"The human foot is a masterpiece of engineering and a work of art."
—Leonardo da Vinci

Foot functionality is one of the most overlooked and generally ignored aspects of human health and vitality. It's unconscionable that we have so badly neglected this finely tuned, elegantly-evolved critical part of our anatomy under the guise of fashion and supposed comfort or enhanced performance. Think about it for a second: Almost everything you do in your upright, awakened life is either anchored by your feet or initiated with some action that starts with the bottoms of your feet and their intricate neural connection with the surface underneath. We stand, walk, lift, dance, squat, run, do housework or yardwork, kick a ball, swing a club, and perform many other complex fitness/athletic activities and physical labor with our feet serving as the foundation and central element for impact absorption, harnessing of kinetic energy, forward or upward propulsion, and of course for balance, stability, and mobility.

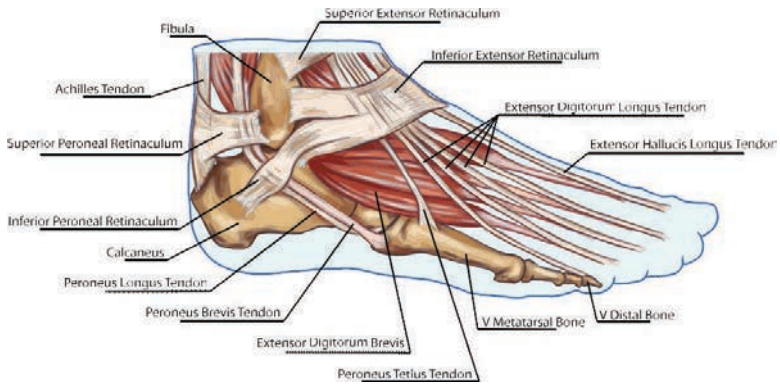


"While we have been programmed to believe otherwise by modern sports shoe marketing, it's an unassailable fact of human physiology that bare feet are functionally superior to shoes."

The fact that we are bipedal (two legs) and not quadrupedal, like so many other mammals, adds yet another layer of complexity: in doing everything we do, we need to be precisely balanced at the same time or we would topple over. Yes, we take standing for granted, but watch an infant struggling to stand or take her first steps and you realize that human locomotion is a miracle. Your ability to perform the most basic life or complex life tasks is rooted in your relationship with the surfaces you stand and walk on, and yet most people have less-than-fully functional feet. Research from the American Podiatric Medical Association reveals that 83 percent of Americans complain of chronic foot pain. Reflect on that for a moment: today, you're an outlier if you *don't* have foot pain! This chronic foot pain is caused by years and decades of wearing elevated, cushioned, rigid, restrictive shoes for work, leisure, and fitness.

It doesn't have to be this way—it's time to get your feet back into the game! We are here to help you correct one of the most fundamental health disconnects in modern life: the bracing and encasing of your feet inside restric-

tive, cushiony shoes. This may be news to you, but the bare human foot is functionally superior and even more comfortable for standing, walking, running, jumping, and landing than the world's best shoes. Obviously, we need a variety of shoes in modern life to deal with hard manmade surfaces, hot or cold temperatures, hazards like broken glass or pine cone pieces, to fit in with social customs, and for complex endeavors that require specialized shoes or that can easily injure exposed feet, such as competitive sports or physical labor. Hence, the idea is to try and minimize the negative aspects of modern footwear by spending more time barefoot or in Peluva shoes (which best simulate a barefoot experience but provide the necessary protection.) When you can have more barefoot influence in your life, you reduce the risk of chronic pain and injury to your feet and lower extremities, and improve your posture, walking and running technique, balance, explosiveness, speed, endurance, and kinesthetic awareness.



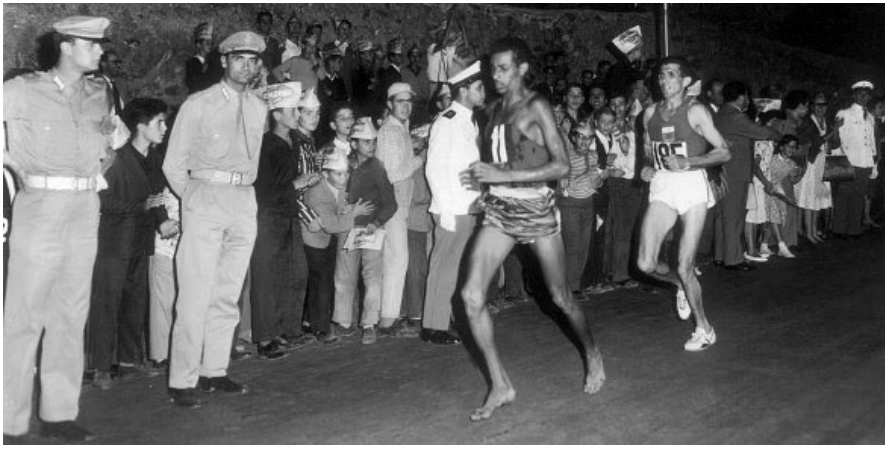
Nothing beats the feet for any feat you try to complete

While we have been programmed to believe otherwise by modern sports shoe marketing, it's an unassailable fact of human physiology that bare feet are functionally superior to shoes, and that shoes are generally terrible for the long-term health and functionality of your feet. The reason feet beat shoes is that the moment you put on a pair of shoes—even high-tech, high-performance athletic shoes, you experience a huge decline in *proprioception*—the awareness of your body moving through space. Proprioception, balance, mobility, and forward propulsion are all highly reliant on the intense and precise biofeedback that the feet receive when interacting with

"When you wear shoes, even high-tech, high-performance athletic shoes, you experience vastly more impact forces and absorb inappropriate skeletal loads compared to striding barefoot."

the ground. Your feet are the most neuro-sensitive areas of your body, which is why Eastern medicine acupressure treatments focus on the feet. The intricate network of nerve endings, muscles, tendons, ligaments, fascia, and 52 bones (around a quarter of the body's total) help you stand, walk, run, and jump gracefully and safely. Highly responsive and functional feet help the lower legs, knees, hips, pelvis, and upper body perform all manner of routine daily activities and complex athletic endeavors safely and effectively.

As we acknowledge the necessity of shoes, it's important to realize that the daily bracing and encasing of your feet into restrictive footwear severely compromises the functioning of your feet and your entire musculoskeletal system. Shoes interfere with the foot doing its job to absorb impact, balance bodyweight, initiate complex kinetic chain activity, and generate forward propulsion. When you wear shoes—even high-tech, high-performance athletic shoes—you experience vastly more impact forces and absorb inappropriate skeletal loads compared to striding barefoot. This causes repeated micro-trauma to muscles, joints, and connective tissue throughout the lower body, resulting in chronic aches, pains, injuries, poor posture and movement mechanics, and referred pain and dysfunction throughout the



Before, "Just Do It," Abebe Bikila just did it, without shoes.



***"Peluva offers the most authentic barefoot-like footwear experience because of the important distinctive feature of* individually articulated toes."**

lower extremities and even into your lower back and upper body. Amidst all this atrophy and dysfunction, you make technique compensations that ingrain further inefficiencies and injuries.

Over time, since your feet can't do their job when encased in shoes (and eventually can't even do their job when barefoot due to atrophy), you become more reliant on cushioned shoes, arch supports, pads, braces, custom orthotics, and perhaps even medications and surgical procedures to keep your body moving. This tailspin into increasing dysfunction and band-aid solutions is so common that we've come to believe it's normal—that our feet just wear out over time. Consequently, we become vulnerable to brainwashing from the giant performance athletic shoe industry that we shouldn't do so much as run around the park or put in an eight-hour shift at an active job without wearing high-tech motion-control super-cushioned shoes. This is an ironic message for running historians who remember the great Ethiopian Abebe Bikila, who won Olympic marathon gold in 1960 in a new world record time of 2 hours, 15 minutes, running *barefoot* through the streets of Rome.

Putting barefoot Olympic marathon victories aside for a moment, the recent rise of the minimalist shoe movement has helped topple flawed conventional wisdom about footwear and allow many to enjoy a more barefoot-inspired lifestyle. While there are many excellent minimalist footwear

options that give your feet more freedom and dynamic movement, the five-toe Peluva design is a step ahead (pun alert!) of all of them. Peluva offers the most authentic barefoot-like footwear experience because of the important distinctive feature of *individually articulated toes*—separating the toes into five individual chambers. This allows the foot to function in the most anatomically correct manner, where the metatarsals and toes can have complete freedom to move independently, dynamically, and through multiple planes on every stride. This promotes optimal impact absorption, balance, proprioception, and forward propulsion.

"Strive to gradually integrate more time in bare feet or Peluvas, and monitoring your progress carefully to protect against setbacks."

The idea here is not to replace your high heels, favorite long-distance running shoes, or work boots, but to gracefully transition to spending more time and doing more activities barefoot, in Peluvas, or in the most minimalist shoe possible in the relevant category. The closer you can get to barefoot, the better; just like a goal of minimizing processed foods in favor of wholesome foods. Later in this eBook, we provide extensive guidelines (with novice, intermediate, and advanced protocols) to help you make safe and steady progress.



With a solid foundation of barefoot time, Peluva time, and a general effort to be as minimalist as possible with your footwear choices, your feet will be better adapted when you do wear specialized footwear for fashion, work, or complex athletic activities. You can certainly do foot strengthening exercises and therapy modalities to improve foot function, but nothing beats spending more time barefoot or in barefoot-like footwear to naturally strengthen your feet.



This eBook will acquaint you with the amazing talent of human locomotion—we are the most well-adapted bipedal creatures on the planet!; describe how to implement correct technique for the disparate gaits of walking and running; detail the design flaws and foot problems caused by cushiony, restrictive modern footwear; explain how Peluva has reimagined minimalist footwear to present the most functional, stylish, and comfortable footwear options for all manner of everyday use and assorted fitness and athletic endeavors; describe an ideal strategy for endurance runners to improve foot health without risking injury; and present a specialized shoe usage strategy to help you optimize barefoot influence while being safe and functional when performing activities requiring specialized shoes.

Granted, making a smooth transition into a more barefoot-oriented lifestyle after years and decades of reliance on cushioned shoes can be a big challenge. It's critical to proceed with patience and caution by gradually integrating more casual time in bare feet or Peluvas, and monitoring your progress carefully to protect against setbacks like stiffness, soreness, or minor new aches and pains. As you build a solid foundation of going barefoot or wearing Peluvas in everyday life, Peluvas may eventually become your go-to footwear for many fitness and athletic endeavors: gym classes and strength training sessions for sure; long walks and hikes—especially on mellow surfaces; and eventually more challenging activities such as rugged hiking (really!), running, jumping, sprinting, and side-to-side sports like pickleball, Ultimate Frisbee, and CrossFit workouts.

WE'RE NUMBER ONE!
THE AMAZING TALENT OF HUMAN LOCOMOTION



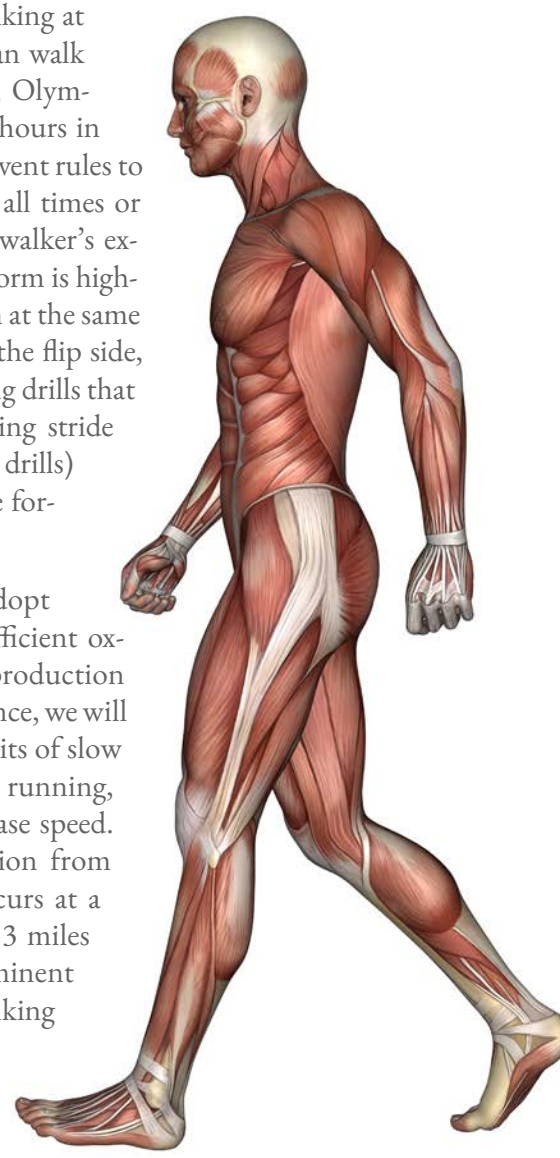
Humans are by far the most adapted creatures on earth for bipedal locomotion—upright walking and running. We can outrun any animal over a long distance, even endurance horses—and gain an even greater advantage against all comers in the animal kingdom when temperatures are warm or hot. Evolutionary anthropologists can regale you with the array of genetic attributes that *Homo sapiens* exhibit for efficient bipedal locomotion, in contrast to our ape cousins who lack such attributes and are much less efficient movers.

"Humans are by far the most adapted creatures on earth for bipedal locomotion, and can outrun any animal over a long distance."

We have the most efficient evaporative cooling system—sweating—to outlast any animal in the heat. We have ideal toe size for walking and running, unlike earlier hominin ancestors and other apes with longer, less functional toes. The metatarsophalangeal joint, which acts as a hinge between the human toe and midfoot, is a prominent evolutionary advantage. We have spring-like tendons and connective tissue throughout the feet and lower legs—the Achilles tendon being the most prominent example—that enable us to gracefully absorb impact, coil elastic energy, and deliver explosive forward propulsion on each stride. These descriptives are not just a physiology lesson. Anthropologists strongly validate that our prowess for both sprinting and endurance locomotion was a key factor in our rising to the top of the food chain amidst the withering selection pressure of evolution. Foot functionality was a matter of life or death for eons, and we've essentially disregarded and destroyed this quintessential human attribute in favor of restrictive modern shoes. Time to do something about it!

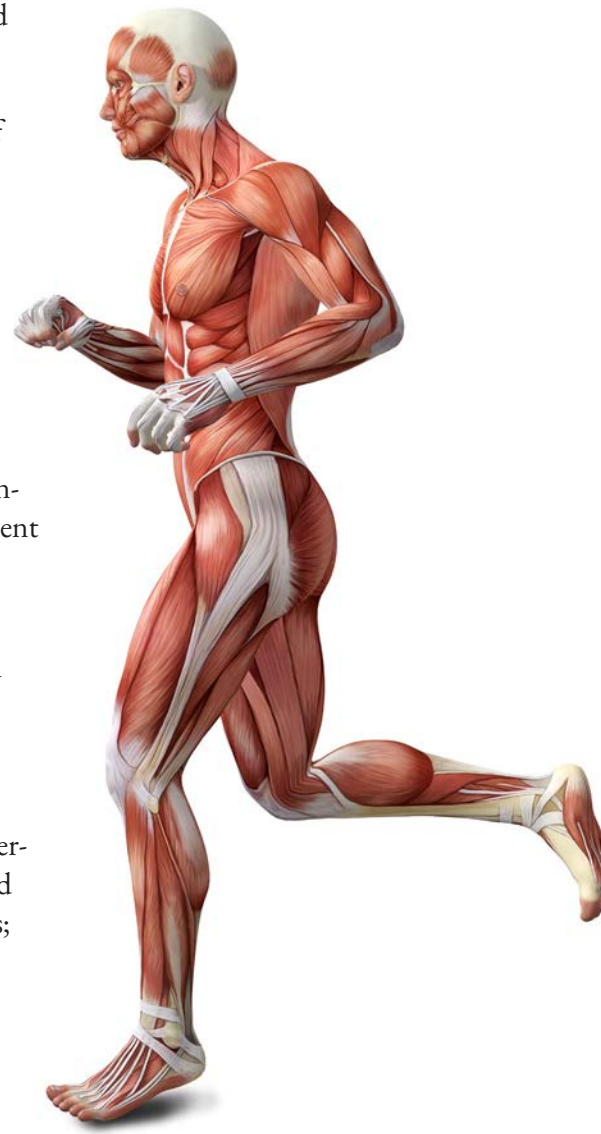
WALKING AND RUNNING: **TECHNIQUE ATTRIBUTES**

In exercise physiology, walking and running are considered two distinct gait modes. They have similar neural patterns but some important technique differences. It's possible to engage the gaits of either running or walking at wide ranges of speeds (e.g., we can walk fast or run slowly.) For example, Olympic race walkers can break three hours in the marathon while adhering to event rules to keep one foot on the ground at all times or face disqualification. Alas, a racewalker's extreme swivel-hipping, waddling form is highly inefficient—i.e., they could run at the same speed with much less effort. On the flip side, one can perform difficult sprinting drills that exaggerate portions of the running stride (such as skipping or high knees drills) at a high intensity level, yet move forward at a mere walking pace.



Typically, we will instinctively adopt a gait that results in the most efficient oxygen consumption and energy production for a particular desired speed. Hence, we will naturally proceed through the gaits of slow walking, brisk walking, jogging, running, and finally sprinting as we increase speed. In most cases, a natural transition from walking gait to running gait occurs at a speed of around 7 kilometers/4.3 miles per hour. Some of the most prominent distinguishing features of the walking and running gaits are:

- Running has a “flight phase” where both legs are in the air (known as “double float”). Walking has one leg grounded to support body-weight at all times (known as “double support.”) The flight phase is the most important distinction between running and walking.
- Heel-first landing for walking versus a midfoot landing for jogging, running, and sprinting.
- Running requires increased muscle activation, oxygen consumption, balance, stride length, joint range of motion, and vertical force production
- Ground contact time for both walking and running is around 50-60 percent of the total time required to take a stride.
- When running, ground contact time lessens by 35 percent compared to walking.
- Running generates at least 50 percent more force than walking, and the percentage increases further when sprinting.
- Overall, running is characterized by high peak forces and short ground contact times; walking is characterized by low peak forces and longer ground contact times.



Whether you're walking or running, the full range of motion and functionality of the human foot is critical for absorbing impact, balancing moving bodyweight, harnessing elastic energy, and generating propulsion for the next stride.

Correct Walking Technique

The optimal way for humans to walk starts with assuming correct standing posture: a straight and elongated spine from head through tailbone; head and shoulders in vertical alignment with the spine; torso, hips, knees, and feet facing forward; and a balanced center of gravity with weight loaded onto your heels. You engage the abdominals lightly to achieve a slightly anteverted (downward pointing) pelvis and prevent excessive arching of the back or loose, protruding abdominals.




“Heel-striking is the correct technique for walking, but not running.”

From a nice standing posture, you commence the walking stride by stepping forward and landing gently on the heel. The heel's weight bearing role for standing and walking is why the calcaneus (heel bone) is so dense and cross-reinforced, and serves as the foundation for all other tarsal and metatarsal bones of the foot. When you heel strike while walking (not running! —we'll get to that shortly), the extra fat pad on the heel will absorb some of the landing force. As you land, you will quickly move your bodyweight over your foot in sync with the foot rolling onto an arch that flattens and tightens. This allows the plantar fascia and the complementary muscles in the arch area to act as natural shock absorbers, as well as begin the process of harnessing elastic energy to be used for takeoff propulsion. Even the bones of the midfoot like the talonavicular and calcaneocuboid, as well as the ankle, are built for flexibility, shock absorption, and elastic energy storage. The extra fat under the midfoot also helps with impact absorption.

Your center of gravity loads over your foot when it's flat on the ground in the middle of the stride pattern. At this point, the foot, knee, hip, and shoulders are aligned and perpendicular to the ground. A smooth and synchronized rolling of the foot through the stride pattern helps to minimize impact trauma and generate propulsion for the next stride. When you load the midfoot, the toes "splay" wide (aka "toe abduction") for balance, impact absorption, and the harnessing of elastic energy for takeoff.

An efficient takeoff is initiated by the dorsiflexion of the big toe and the other toes. This helps trigger a chain reaction of harnessing elastic energy for forward propulsion. The toes flex, the spring-loaded arch and Achilles tendon start to uncoil, and the muscles of the calf and glute also are prompted to fire by the triggering effect of the big toe. Your arms will swing naturally in coordination with your leg movements. This means the left arm swings forward in tandem with the right leg swinging forward, and vice versa. The arm swing helps the body stay in balance so the counter-balanced leg swing can generate forward propulsion. Arms can bend to around a 90-degree angle on the forward swing, and get to near straight during the down and back swing.

At final pushoff, the toes and ankle move to plantar-flexed (pointed) positions. The ankle and toes will then dorsiflex (ankle angle lessens, toes flex toward the sky) while airborne in preparation for the next heel-first landing. You must take quick, efficient walking strides of optimal length to op-

timize impact absorption and generate efficient forward propulsion. This starts with a soft landing onto the heel just ahead of your center of gravity, rolling through arch, loading onto the midfoot, and then taking off from the toes. You must be careful to avoid overstriding, evidenced by a heavy landing onto the heel. This causes a braking effect on each stride and excess impact load dissipated throughout the lower extremities.

IS A DUCK-FOOTED STRIDE OKAY?

Many people stand, and walk, with their feet pointing slightly or severely outward from center line—a "turned out" or "duck-footed" position. This tendency can be influenced by genetics, taking your first steps that way as a toddler, and can also develop as an adaptation to sport-specific training. For example, ballerinas train to assume this position. Sprinters with powerful hip flexion often walk, and stride at high speed, with feet turned out as a result. If you If you have adapted to a turned out (or pigeon-toed) position and feel comfortable, you don't have to worry about it. However, it's possible that duck-footed standing posture or walking/running stride can promote muscle imbalances and increased risk of pain, injury, and dysfunction throughout the lower extremities.

Some research suggests that a turned out position can put excessive tension on the plantar fascia, cause atrophy to the intrinsic muscles of the foot and arch (due to a lack of tension in comparison to being appropriately engaged when standing or walking with forward facing feet), and excessive strain on the anterior and posterior tibialis (front of shin), and the flexor hallucis longus and digitorum longus (big toe operators.) It's also possible to develop dysfunctions to compensate for a turned out position, such as internal rotation of the tibia and fibula, and external rotation of the femur. This can cause muscle stiffness, sciatic nerve pain, lower back curvature, excessive knee strain, and inappropriate positioning of the hips.

If you have chronic issues in the lower extremities and/or an extreme turned out position, you may want to try pointing your feet straight, or closer to straight, when walking, and especially when standing. You can also do alignment exercises that can help cor-

rect imbalances that can cause pain. Good resources include Katy Bowman's Move Your DNA and Esther Gokhale's 8 Steps To A Pain-Free Back.

When it comes to running, it can be much more difficult and problematic to try and alter highly ingrained technique. It's also possible that your unique anatomical structure strongly influences whether your run pigeon toed, turned out, or somewhere in between. Observe the lanes of runners in world-class track&field competitions and you will see tremendous variation in foot position, foot strike, and leg swing patterns, and also asymmetry between legs (e.g., one foot pointed out and another foot near straight.) While exercise physiologist and technique experts might argue that these attributes are sub-optimal and increase injury risk,it's hard to criticize athletes performing at the highest level. They have adapted to their anatomical particulars and technique attributes over time, and don't want to take the risk of trying to correct with a new unfamiliar pattern such as pointing the feet straight.

Whatever the combination of habit patterns and anatomical structure that forged your current running technique, it may be best to work with what you have and perhaps strive to make minor revisions over time. If you force yourself to execute "correct" technique, you can increase injury risk because your muscles, joints, and connective tissue are not adapted.

Correct Running Technique

The optimal way for humans to run is to strike the ground in the forefoot/midfoot area, emphasizing the outer edge of the foot. The ankle is plantar-flexed (pointed) at impact and will dorsiflex (ankle angle lessens) during the landing to minimize the collision force of your bodyweight striking the ground. At footstrike, the center of gravity is balanced—feet, knees, and shoulders are aligned and perpendicular to the ground over the landed midfoot. Then, the metatarsals will spread wide to help absorb impact, and the toes will grab the ground to provide balance and start harnessing energy for forward propulsion. Next, an inward rolling motion starts as the entire midfoot and arch come to the ground. The arch flattens upon impact, causing the foot to roll inward in what's called pronation. Finally, the Achilles ten-

"The dorsiflexion of the big toe is the trigger for glute activation during the running stride."

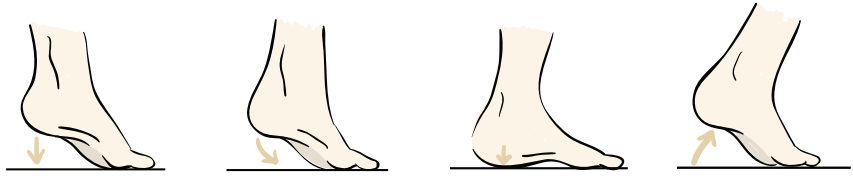


don and heel will drop to the ground to further absorb impact and start coiling energy through the foot and calf muscles for an explosive takeoff. At final landing, your entire foot touches the ground briefly (including the heel, very gently.)

For takeoff, the big toe plays an important role by dorsiflexing to harness elastic energy and balance for takeoff. It is also the trigger for glute activation for the running stride. The weight of your entire body moves over this single joint during the running stride, making the big toe one of the most critical functionalities of all. When the big toe is weak, rigid, and poorly functional (in part due to atrophy, and also due to being constrained in a shoe), it causes a chain reaction of dysfunction and excess load on other joints and connective tissue.

As the big toe plants and dorsiflexes (the other toes do so also), the plantar fascia tightens along your longitudinal arch. This is known as the "windlass mechanism." Windlass is a sailing term describing the tightening of a rope or cable. In the body, the dorsiflexion of the big toe causes the plantar fascia to tighten and support the weight of the body during the stride. The toes harness energy by going from dorsiflexed (bent) to plantar-flexed (straightened) as the foot leaves the ground. Then, the incredibly strong and coiled Achilles tendon rises from the ground and a forceful launch occurs from what's called, "rotational kinetic energy" in the toes, metatarsals, arch, Achilles, and calf muscles. Rotational kinetic energy is the conversion of elastic energy (potential energy stored by the temporary compression of the aforementioned muscles and joints in the lower body) into forward propulsion.

The foot's optimal range of motion through a stride



1. Midfoot landing and metatarsals widen to absorb impact

2. Foot pronates and arch flattens

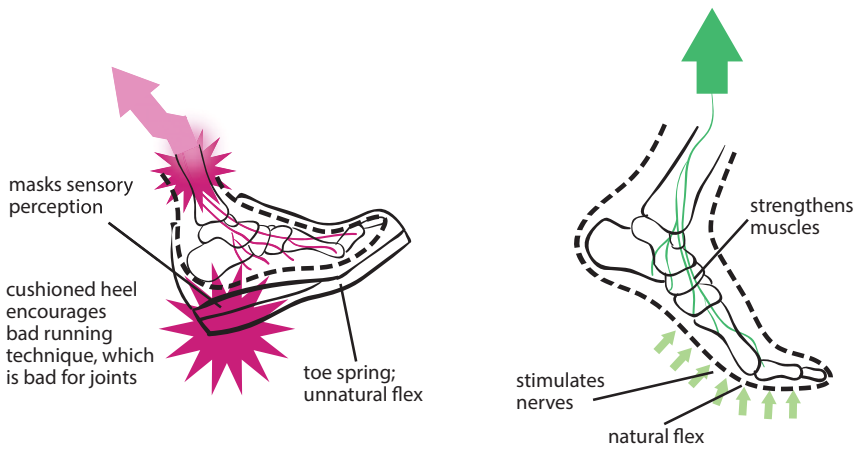
3. Achilles snaps to the ground to

4. Explosive takeoff!

The sequence is repeated with strides of ideal length to keep your center of gravity balanced over the landing foot, and with rapid turnover to maximize the rotational kinetic energy generated on each stride. As you process this step-by-step description of the elegant mechanics of the human running stride, realize that every single element of the sequence is severely compromised when you put shoes on.

Here's a quick drill that will help you immediately experience what it feels like to run with correct form, absorb shock optimally, and become springier and more propulsive. Find a smooth stretch of pavement or a hard indoor surface such as a basketball court or long hallway. Remove your shoes and take some running strides at a decent pace. You will notice that you instinctively land lightly and gracefully on the midfoot, with a balanced center of gravity, and a harnessing of rotational kinetic energy for an explosive takeoff. Dr. Daniel Lieberman, a human evolutionary biology professor at Harvard University, author of *Exercised*, and a leading researcher in barefoot running, published a landmark study in 2012 suggesting that the impact trauma when running barefoot is similar whether the surface is hard or soft! Lieberman argues that this is because runners who land correctly on the midfoot instinctively bend their knees and ankles in a manner that aligns with the hardness of the surface they are running on to minimize impact trauma (more bend is needed on harder surfaces.)

Shoes compromise form and cause atrophy



"Impact trauma when running barefoot is similar whether the surface is hard or soft, because the body instinctively adapts to minimize impact trauma on each stride."

Even if you're a novice and untrained in correct running mechanics, you can quickly improve your technique by introducing some faster-paced running, ideally while barefoot or in Peluvas, and on a forgiving surface such as a grass or turf field or rubber track. The aforementioned drill of running barefoot briefly on a hard surface is just to get a brief glimpse at your natural ability to absorb impact optimally. Stephen McGregor, Ph.D., an exercise scientist at Eastern Michigan University and co-author of *The Runner's Edge*, has studied running form with the use of high-resolution tri-axial accelerometers, and come to a decidedly non-scientific definition of proper technique. McGregor believes that, "Skillful running is the result of an unconscious, evolutionary process wherein each runner's unique body finds its own best way to run economically." McGregor believes that this discovery process is best facilitated by running at fast speeds, varying the terrain, distance, and speed of your workouts, running in a fatigued state to challenge the nervous system to produce a consistent stride, and training in a pack of faster runners. It is this amazing kinesthetic awareness that we want to recapture for all manner of daily life by minimizing your use of bulky shoes and spending the maximum possible time barefoot or in Peluvas!

THE PROBLEMS WITH "**BRACE & ENCASE**" MODERN FOOTWEAR

Modern shoes are horrible for your feet! So are expensive orthotics, arch supports, braces, cushions, and all the other gadgets in the multi-billion dollar "foot care" industry. Sorry to piss off Dr. Scholl and Nike Founder Phil Knight, but we are treating symptoms instead of addressing the problems caused by modern footwear. It's similar to taking prescription medications to quickly provide temporary relief for conditions that are driven by eating processed foods. The mainstream consumerism paradigm of purchasing fantastic new shoes with more cushion and motion control to help your dysfunctional and atrophied feet feel more comfortable is an example

"Modern footwear messes with human biomechanics honed over two million years of human evolution."

of what Mark Sisson calls, "digging a hole to install a ladder to wash the basement windows."

Almost all conventional shoes are too cramped, too thick, too cushioned, and/or too elevated in the heel. This causes an assortment of major dysfunctions:

- Poor posture—loading bodyweight over the midfoot instead of the heel, resulting in hunched shoulders and compressed cervical spine
- Atrophy of the arch and important small stabilizer muscles in the foot
- Atrophy and loss of mobility in the critically important big toe, as well as the other toes
- Weakening and shortening of the calf muscles and Achilles tendon
- Functional strength imbalance between the hamstrings and quadriceps
- Misshaping of the primary structural components of the foot (small bones, cartilage, and tendons)

When we don modern footwear, we are interfering with the extremely precise and delicate interactions of our moving feet and legs that have been honed by two million years of human evolution. Messing with our species-appropriate locomotion techniques manifests in many ways, such as chronic foot pain and foot conditions, and both chronic and acute injuries among fitness enthusiasts—especially endurance runners.

It's obvious how high heels; elevated, cushioned, restrictive sports shoes; and other exotic and fashionable footwear compromise foot health, but we are compelled to wear these shoes for many occasions in modern life. Don't worry, we don't want to cramp your style! It's okay to use your chosen footwear for a night out on the town, construction work, pedaling a bicycle, playing

basketball, running long distances on hard surfaces, or playing golf (although we are working on a Peluva golf shoe that will blow golfers' minds soon!) The main goal of improving foot function and reducing pain and injury risk is to carefully dedicate as much time as you can to walking around barefoot or wearing Peluvas. This will help you optimize the function of your foot, the muscles and joints in your legs, and all kinetic chain activity that starts from the ground. On the occasions when you use specialized shoes, your feet will be more resilient against their negative effects and more functional overall for whatever you are doing in those shoes.

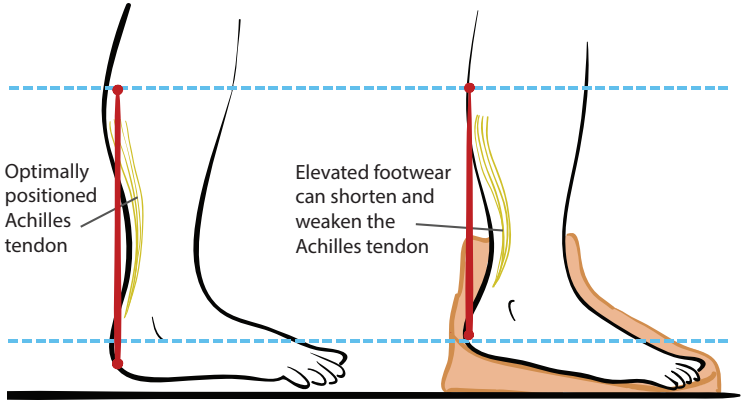
Following are the most health-destructive aspects of elevated, cushioned, restrictive footwear:

ELEVATED HEEL: Virtually all dress shoes, work shoes, and athletic shoes have more padding in the heel than in the midfoot or the toes. This can be measured by the amount of vertical "drop"—how far off the ground your heel is compared to your toes. A typical dress shoe or tennis shoe might put your heel 10-30 millimeters (.4" to 1.2") higher than your toes; hence a running shoe might be described as having a "10mm drop." In contrast, Peluva and other minimalist shoes have "zero drop," meaning your entire foot is the same distance from the ground—the sole is completely flat.

"Vertical drop describes the difference between heel and toe elevation off the ground."

When the heel is elevated, this severely compromises the function of the Achilles tendon, which is the main source of force production during the walking stride and the running stride. An elevated heel prevents the Achilles tendon from lengthening fully and coiling to provide spring-like energy for forward propulsion on every stride. Over time, your Achilles—the largest and most powerful tendon in the body—becomes weakened, shortened, and more vulnerable to injury.

A strong, functional Achilles tendon is essential to the health of your foot, all manner of everyday movement, and all manner of athletic performance. Evolutionary anthropologists and exercise physiologists assert that the Achilles is the key to human running prowess and one of the major distinguish-



Even a slight heel elevation can cause atrophy and dysfunction in the Achilles tendon and the complex bone/tendon/muscle structure of the foot

ing characteristics of humans branching out from our ape cousins millions of years ago. Chimpanzees, gorillas, and others in our evolutionary family tree who lack a robust Achilles tendon or a prominent longitudinal arch are consequently ill-suited for both sprinting and long-distance running. British computational primatologist Bill Sellers believes that the development of a strong Achilles tendon was the *primary evolutionary adaptation* that allowed humans to become hunters instead of herbivores! The ability of our Achilles tendons to provide "elastic energy storage" (our arches do this also) is believed to increase top human running speed by over 80 percent in comparison to apes. Besides all that, the human Achilles tendon is no big deal—go ahead and shorten and deactivate it in your shoes every day...

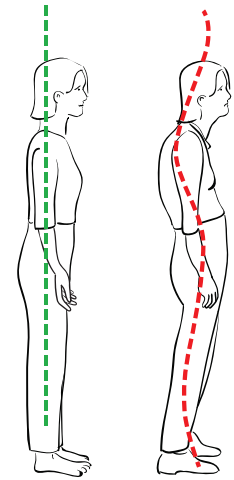
POOR POSTURE: Shoes with a significant drop from heel to midfoot not only compromise the Achilles tendon, they also promote poor posture and dysfunction in muscles and joints throughout the body. When you stand in an elevated-heel shoe, it forces your center of mass to load over the balls of your feet instead of your heels. This promotes a chain reaction of adverse compensations, such as a tucked pelvis, a hyperextended lumbar (lower) spine, a curved thoracic spine (mid-back), and the forward-hunched shoulders and compressed cervical (upper) spine that are the most familiar signs of poor posture.

Humans are designed to stand with body weight loaded over our heels—again witness the strength of the calcaneus bone. Optimal posture starts

"The development of a strong Achilles tendon was the primary evolutionary adaptation that allowed humans to become hunters instead of herbivores!"

with (and is reliant upon) the weight of the legs, torso, and head to load over the heels. As soon as you slip on shoes with an elevated heel, you are forced into bad posture, and it's hard to correct even if you try.

Here is a quick test to validate the importance of the calcaneus as your postural base: Stand with your bare feet facing directly forward and rock all of your body weight back onto your heel bone. Then, roll your shoulders backward in a circular motion so that they end in perfect vertical alignment with your spine and your ears. Turn your palms outward to help you maintain this upper body alignment. Notice how your head, spinal column, pelvis, legs, and feet feel more balanced and comfortable when everything is loaded on your calcaneus.



Feet, pelvis, spine, neck...no part of the body is unaffected by a heeled shoe

EXCESSIVE HEEL CUSHIONING: An elevated, cushioned heel promotes inefficient walking and running technique and actually worsens the impact trauma of each stride significantly. This is the exact opposite of the marketing claims that running shoes minimize impact trauma and increase comfort! Even when you take a leisurely jog, you generate an impact force of 3-4 times body weight on each stride. When sprinting, it's even more. Researchers discovered that Jamaican sprinter Usain Bolt generated vertical force of nearly five times his bodyweight (nearly 1,000 pounds!) on each footstrike! This tremendous force production is what enabled him to take eight-foot strides and break world records. The miraculous human body is highly adapted to handle such a load with grace and efficiency, with the bare foot handling most of the work. After all, over 25 percent of all the bones and muscles in the body are located in the ankle and foot, and there are 33 joints in each foot. On every stride, this complex network works harmoniously to absorb impact, maintain balance, and provide forward propulsion for the next stride.

"Elevated, cushioned shoes promote an inefficient and destructive heel-first strike."

Running in a cushy elevated shoe prevents the foot from doing its job of absorbing impact and harnessing energy for an explosive takeoff. Instead, cushy shoes promote a heel strike—landing on the ground heel first, then rolling into a forefoot takeoff. This is a highly inefficient technique that would be extremely jarring and painful if you weren't wearing cushy shoes. Stand barefoot, then hop into the into the air and try to land on your heels—your body will instinctively not want to do so! If you force yourself to heel-land, even a six-inch landing on a hard surface will hurt. Now try to jump off an elevated perch like a bench or plyo box and land naturally: you will instinctively execute a perfect midfoot landing, flatten the arch, and quickly bring the Achilles to the ground to complete the landing.

When you heel strike in shoes, the impact load of 3-4x body weight is inefficiently dissipated through the shins, knees, thighs, hips, pelvis, and lower back. Dr. Lieberman's 2012 study titled, "Foot strike patterns and collision forces in habitually barefoot versus shod runners," revealed that a midfoot strike is far more efficient and generates less impact trauma than a heel strike. Lieberman explains that landing on your heel generates an impact force seven times greater than the impact load of a forefoot landing in bare feet. He asserts that a heel strike while running is, "essentially the same as hitting your heel with a hammer with two times your body weight," and that a cushioned shoe will dampen perhaps only around 10 percent of that force.

Consider that a typical jogger will take an average of 900 strides per mile, so a 150-pound person running five miles is going to absorb around 2.3 million pounds of force. When you inefficiently absorb millions of pounds of impact energy on every run, you are bound to incur microtraumas to the muscles, joints, and connective tissue. With repetitive microtrauma, you develop inflammation, stiffness, and diminished mobility and blood flow. When activity continues on damaged joints and tissue, eventually the pain becomes severe enough to become a full-blown overuse injury that limits activity. Why don't you notice this jarring impact on every stride? Because the cushioned shoe compromises your proprioception!

COMPROMISED KINETIC CHAIN: Shoes with restrictive toe boxes, excess cushioning, stability features, and an elevated heel cause further problems during walking, hiking, running, and dynamic athletic endeavors by compromising the harmonious function of your kinetic chains. This term describes how muscles, joints, and connective tissue interact to perform movements like bending, extending, or jumping. There are an assortment of distinct kinetic chains involving groups of muscles and joints and how they connect to the spine. The five major kinetic chains in the body are: intrinsic, deep longitudinal, lateral, posterior, and anterior.

For example, throwing a ball is not just cocking your arm back and letting it fly. The throwing motion entails complex kinetic chain activity. The power for a throw emanates from the lower body, as you must harness rotational energy through the feet, legs, hips and torso, then synchronize the forceful uncoiling of the lower body with the rotational energy of the shoulder, elbow, hand, and fingers to ultimately let the ball fly with velocity. Similarly, the "pull" of a deadlift is not merely an effort from isolated muscle groups like the lats or the hamstrings, but a synchronized application of force by a complex kinetic chain that starts in your feet and extends through the entire lower body and upper body—mainly what's called the posterior chain (along the back side of your body.) This is why the deadlift is often lauded as one of the most effective full-body, functional exercises.

With a basic understanding of the kinetic chain concept, you can realize that the kinetic chain for most



The individual dorsiflexion of the big toe is critical to engage the glutes (the most powerful muscle in the body!)

The posterior kinetic chain is prominent during the walking and running strides.

"Encasing your feet in elevated shoes is kinda like performing athletic efforts on a balance beam instead of the ground."

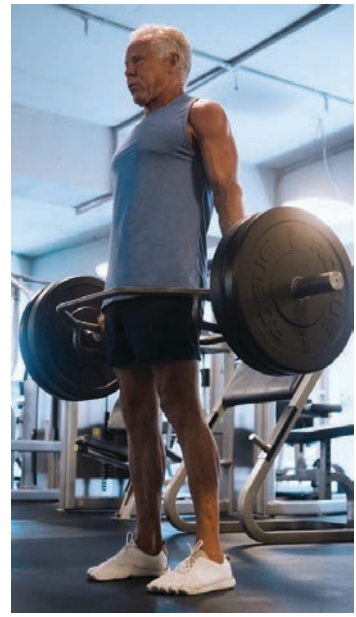
compound athletic movements starts with the feet—throwing, deadlifting, running, jumping, swinging a golf club—you name it. Try throwing something while barefoot and pay attention to how you gracefully engage the various bones, muscles, and connective tissue in your feet to achieve weight transfer and the harnessing of energy to throw the object. Even balancing on one leg entails a complex kinetic chain operation: engaging the arch and metatarsals, and the muscles of the lower leg, upper leg, and hips—all working together to steady your body weight over one foot.

When you wear a shoe with excess cushioning and an elevated heel, you essentially disengage your ankle and feet from the kinetic chain, thereby forcing all complex movements to start from above the foot. This leaves your ankle incredibly vulnerable to turning and spraining and also increases the risk of knee, hip, and lower back injuries vulnerable to dysfunctional kinetic chain activity. Your feet and ankles do an exceptional job of receiving sensory input from the ground and initiating the appropriate kinetic chain in a precise manner for everything from standing upright to performing complex athletic activities. Encasing your feet into elevated shoes is kind of like performing your athletic efforts on a balance beam instead of on flat ground.

TRY THE DEADLIFT TEST TO APPRECIATE BAREFOOT PROPRIOCEPTION

If you have sufficient experience with the deadlift exercise, you can perform some comparison lifts wearing shoes and then going barefoot or with Peluvas. You'll get a dramatic impression of how you improve proprioception, safety, and technique when you lose the shoes. Hopefully you already realize the adverse effects of deadlifting in running shoes, as their elevation and cushioning make for instability when under heavy load. Performing heavy compound lifts such as the squat or deadlift in cushioned shoes can cause you to rock back and forth a bit while holding the heavy weight. This is a desperate attempt to keep your balance when your

proprioception is diminished due to the shoes. An unstable weight and inefficient bar path can misposition and overload vulnerable muscles and joints and cause acute injury. What's more, deadlifting in cushioned shoes causes a significant amount of your force production to be absorbed into the sole, and you have to lift the bar that much higher to account for the inch or more elevation of your sole!



In contrast, when you lift in bare feet, socks, Peluvas, or at least in a zero-drop, flexible, minimalist shoe, your proprioception, safety, and performance all improve significantly. As soon as you raise the bar, you get the distinct sensation of your feet pushing hard into the ground to create leverage. You'll notice the constant micro-adjustments you make with your toes, arches, and heels to maintain efficient force production and balance the heavy load you pull through space. Among serious lifters, pushing the feet into the ground is a popular mental cue to initiate the lift. Engaging the feet in this manner helps to generate stable and powerful forces through the entire kinetic chain involved in the lift. Indeed, experts contend that lifting in bare feet or minimalist shoes allows for better activation of the adductors, hamstrings, and glutes (the hip extensor muscle group), whereas lifting in shoes tends to overburden the quads because the hip extensor muscles don't have a stable kinetic foundation to fire from.

"You get the distinct sensation of your feet pushing hard into the ground to create leverage, and notice the micro-adjustments to maintain efficient force production."

To appreciate the significance of these insights, try this little experiment at your next deadlifting session. After a thorough warmup, perform a few deadlift reps with a somewhat challenging weight while wearing your typical shoes. Try to pay close attention to the sensations in your extremities and major muscle groups as you

hoist the weight from the ground up to your waist. Surely you'll feel the strong pull on the hamstrings and the overall strong engagement of the posterior chain all the way from the ground to your upper back and shoulders. However, you won't feel the sense of connection and synchronization of your feet with your muscles and joints. You might feel your feet wiggling a bit inside the shoes in an effort to achieve stability. Next, try removing your shoes and doing a few reps of the same weight in bare feet or in Peluvas. Notice how much more intensely you experience the application of force into the ground by the feet, how connected you feel along the entire posterior kinetic chain starting from the ground, and the micro-adjustments your feet make to keep the weight stable. You may never go back to deadlifting in regular shoes again!

You may ask, "Why don't I notice the inherent danger and dysfunction of jogging down a trail or doing a deadlift in cushy shoes?" Because the shoes compromise your sensation of dysfunctional kinetic chain activity! Your puffy shoes have you blissfully floating along on a cloud of cloudy proprioception. When the stable base provided by the feet being in contact with the ground on every stride is compromised, the slightest misstep—such as a basketball player landing on part of another player's shoe, or a trail runner hitting an exposed rock or tree root upon landing—can cause the ankle to violently flip sideways for a sprain. In contrast, it's extremely difficult to flip an ankle when barefoot or wearing Peluvas, because your foot is able to quickly react and disperse the unnatural impact efficiently by virtue of being closer and more responsive to the ground. If you want to try and test this theory, don your Peluvas and take a leisurely walk over an extremely uneven surface, such as a rock bed or perhaps a floor scattered with Lego pieces. Your foot and shoe will contort perfectly for every uneven landing to help you keep your balance and minimize impact trauma.

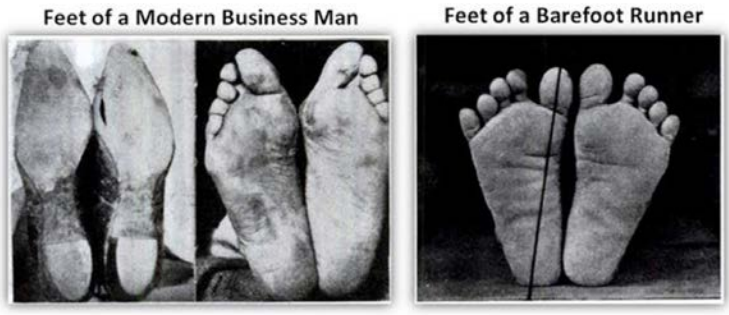
FLAWED RUNNING TECHNIQUE: When you strike the ground heel first, your center of gravity lags behind your foot. Before the next stride, your center of gravity must shift forward into the liftoff phase (which occurs off the forefoot), only to lag behind again with the very next heel strike. Heel striking causes your foot to stay in contact with the ground longer than necessary and compromises the potential transfer of elastic energy into rotational kinetic energy for forward propulsion. Instead, 10 percent of the impact trauma is absorbed into the cushioned heel of the sole, while

"Cushioned shoes promote lazy running mechanics and squander potential kinetic energy."

more impact load dissipates through your extremities in an inappropriate manner. Instead of springing along like a deer, or Abebe Bikila winning Olympic gold, your heel strike creates a subtle braking effect and a jarring effect on every stride.

Cushioned shoes promote lazy running mechanics, squander potential kinetic energy, facilitate imbalanced landings, and cause an inefficient fluctuation in your center of gravity from overstriding. It's hard enough to run 26.2 miles, but even harder when a good chunk of that muscular and cardiovascular power you are putting out is dissipating into the sole of a shoe and into the ground, instead of propelling you forward. Experts believe that this heel striking, overstriding inefficiency is exhibited by at least 80 percent, and perhaps up to 95 percent, of all recreational joggers and runners. *Note*: the biomechanics of walking differ from running such that a heel-first landing is the appropriate way for the human to walk. When you walk, one leg is on the ground at all times, so are not transferring bodyweight from foot to foot. However, an elevated shoe interferes with a proper barefoot heel strike such that even our walking form is compromised in shoes.

ENCASED AND SQUEEZED MIDFOOT AND TOES: All regular shoes inhibit the functionality of the midfoot and toes by encasing them in a single chamber that is typically far too narrow. Even shoes designated as "wide," with a wider midfoot area, typically narrow into the toe area to achieve a stylish look. That's right, one of the main design flaws of modern shoes exists purely for appearance. Historians relate that the streamlined toe box seen in both women's and men's dress shoes dates back centuries to the times when



peasants wore makeshift work shoes with a wide front, while aristocrats sported stylishly-crafted shoes with pointed toes. The narrow front area of today's athletic shoes is intended to provide "stability" for the foot by pinching the toes together. This is particularly evident in custom soccer, track & field, and rock-climbing shoes.

When the metatarsals are pressed together and the toes encased, they are prevented from performing their dynamic range of motion (described previously) that's required for optimal impact absorption and forward propulsion. In particular, the toes and metatarsals cannot splay sideways to absorb impact properly, and the big toe cannot achieve its full range of motion that is so critical to the engagement of the glutes during the running stride. Instead, the restricting the front of the foot causes a loss of kinetic energy and that harmful dispersion of impact trauma into the lower extremities. What's more, the incredibly high incidence of foot maladies such as corns, bunions, hammer toes, plantar warts, dermatitis, fungus, ingrown toenails, and athlete's foot are highly influenced by forcing your feet to squeeze into tight compartments.

> ***"Encasing the toes into a single chamber inhibits their dynamic range of motion, impact absorption, and forward propulsion."***

The minimalist shoe models that appear to be shaped like a foot in the front (a wide arc, with the big toe side sticking out further than the other side of the shoe) improve the situation markedly, but they still inhibit the important full spreading of the metatarsals and individual articulation of the toes on multiple planes for impact absorption, balance (especially on uneven surfaces), and explosive forward propulsion. Furthermore, a customization problem arises when trying to make a wide shoe with a single chamber for all toes. People who claim to have wide feet might have width through the full length of the foot, or have a fan shape where the back and midfoot are normal or even narrow, and the toes are wide. The only way to stick the toes into a single box and accommodate the individual variation in foot shapes and sizes would be to make numerous widths of the same size shoe. With the individual articulation of the toes in Peluvas, you are able to achieve your own custom fit because the toes are free to do what they naturally do when standing or walking. *Note*: With Peluvas, the main fitting objective

is your toes feeling comfortable in their individual chambers. Peluva users who have longer toes will typically order a half-size larger than their regular shoe size to ensure the toes are not cramped.

TOE SPRING: Most running shoes have a distinct upward curvature of the sole (typically around 15 degrees), starting around the midfoot heading toward the toes, a feature known as "toe spring." A toe spring is apparent when a shoe rests on the ground and the toe box is slightly elevated off the ground. The toe spring helps facilitate a "rocking" motion while walking, which is believed to minimize impact trauma—notice certain shoes marketed for walking with extreme front to rear sole curvature. The toe spring is also believed to improve running performance by pre-loading the toes into their dorsiflexed, energy-coiled position. Running performance lab research suggests this may be true, but further study is needed. Elite runner and prominent sports science journalist Alex Hutchinson (author of *Endure*) observes that the carbon plates in the energy return "super shoes" have a toe-spring curvature, which he speculates (not research proven) is a prominent reason for the improved running economy delivered by super shoes.



Running shoe attributes like elevated heel, cushioning, toe spring, and arch support indeed promote a comfortable ride, as do supremely-conditioned bare feet!

Pre-loading your toes into a coiled position with toe spring shoes may provide a performance benefit, but it prevents the toes from working through their typical range of motion during the walking or running stride. This is believed to cause atrophy to important muscles and connective tissue in the foot. What's more, a Harvard study led by Dr. Daniel Lieberman delivered a preliminary assertion that toe springs transfers an excessive and inappropriate burden of impact absorption and propulsion to the highly vulnerable plantar fascia. Other researchers speculate that a toe spring will also disperse impact force away from the foot to overburden the knees and hips.



EXCESSIVE ARCH SUPPORT: Reinforced arches and rigid orthotics will deactivate and weaken your arch with every protected step that you take. The extremely common condition of plantar fasciitis is driven by overstressing weak arches, Achilles tendons, and calf muscles with routine repetitive activity such as standing, walking, and running. The typical plantar fasciitis treatment protocol of rest and more arch support has been largely unsuccessful, because it results in further atrophy of the relevant tendons and muscles, and does not address the root cause. As soon as exercise is resumed after a plantar fasciitis layoff, the painful condition typically returns—often worse than before the rest period because of atrophy.

Strengthening the foot is the long-term solution, but one must proceed carefully because the foot is not adapted for a cold turkey transition over to minimalist footwear with zero drop and minimal padding. We recommend wearing Peluva shoes for routine daily activity, especially walking. Banking lots of low key Peluva time will build some resilience in your feet so that you might one day carefully integrate medium or high-impact activities such as jogging, running, or dynamic fitness or athletic movement if you are interested. In tandem with everyday use of Peluvas, strive to walk around your home barefoot as much as possible. You can check out the transition protocols for novice, intermediate and advanced enthusiasts in an upcoming section.

If you are feeling skeptical at this point that shoes are the enemy, try this little experiment. Stand in your favorite pair of active lifestyle or athletic shoes and try to balance on one leg...with your eyes closed! Most of us will find this to be incredibly hard. Now, try standing on one leg barefoot and notice how efficiently and dynamically your arch, individual toes and metatarsals, and calcaneus absorb and disperse your unsteady center of gravity through subtle muscle contractions and weight shifts to try and keep you in balance.

MY FLIP-FLOPS ARE OKAY, RIGHT? RIGHT?



If you think flip-flop sandals qualify for barefoot-inspired/minimalist footwear, think again. Any footwear that does not fully connect to the foot, such as casual sliders, house slippers, mules, Crocs, clogs, and other slip-on type products, will adversely alter your natural gait pattern. When you proceed through the stride pattern with loosely-connected footwear, bones and tendons must contort in various unorthodox ways in order to maintain contact with the shoes. This can create chronic tension in certain muscles and joints and cause inappropriate impact trauma during the stride. You can sense this easily by taking a few really slow steps in flip flops; you'll notice how your toes clench a bit in order to keep the sandal from flying off your foot. Your toes clench indeed, but there are also subtle dysfunctions that happen throughout the lower body, such as extra tension in anterior tibialis muscle, and alteration of how the hips and quads operate during the stride pattern. Of course, if you are using your flip flops to walk from your hotel room to the pool, it's no big deal. But if you're walking significant distances in loosely-connected footwear, it can create some real problems.

The popular category of huarache-style sport sandals (Luna, Xero, Unshoes, etc.) that secure your feet with straps to a flat sole are a different story. Because your feet remain connected to the sole, strapped sandals represent some of the most functional minimalist footwear you can get. It's great to see more people walking around in these shoes—some even wear them in the gym or for long distance running. Alas, sport sandals offer minimal protection against obstacles and may be fashion inappropriate in many situations (restaurant dining, going to the office, etc.)

THE PELUVA PROMISE: LETTING **YOUR FEET BE FEET**

Minimalist footwear products have taken off in the last decade in tandem with the growth of the ancestral health movement. Shoes with minimal padding or arch support, and with zero drop (or close) challenge the feet to be more active and functional when standing, and during the walking or running stride pattern. Peluva takes minimalist footwear to the next level with the important distinctive feature of the individual five-toe articulation (separating each toe into its own compartment, instead of encasing them together.) Don't toss your other models of minimalist shoes just yet, as they are vastly superior to brace and encase footwear. But perhaps consider them a stepping stone or compliments to the ultimate barefoot-style experience of Peluvas. Following are details about Peluva footwear that make them the best active lifestyle footwear ever developed—a shoe Mark Sisson has dreamed about for several decades and finally brought to life after years of research and development.

ARTICULATED TOES: It's critical for our toes to move dynamically as we walk, run, and engage in many other types of everyday movement and activities. The separation of each toe into individual chambers sets Peluva apart from all minimalist shoes that encase the toes together. Separating the toes provides for the most authentic barefoot experience because each toe is free to move independently and dynamically through the horizontal plane (toes splaying wide to absorb ground impact and provide balance) and the vertical plane (dorsiflexing and plantar flexing to absorb impact and generate propulsive energy for takeoff.)

> ***"The separation of each toe into individual chambers is a key distinguishing feature of Peluvas."***

As noted previously, the big toe deserves special distinction in this story for the tremendous influence it has on balance, kinetic chain activity, and forward propulsion when walking, running, and doing side-to-side activity. If the big toe is weak, lacks mobility, or is constrained in a shoe, it will adversely affect the all manner of kinetic chain activity during the running stride, and the walking stride to a lesser extent. From our viewpoint at Peluva, it is

absolutely critical for the big toe to be allowed a separate range of motion from the other toes via the five-toe articulation shoe.

The dorsiflexion of the toe during the takeoff phase is a major catalyst for the activation of the gluteus muscle group during the running stride. The dorsiflexion of the toe creates tension that travels up the leg and into glute muscles, allowing the glutes to engage optimally for forward propulsion. This engagement of the glutes is vitally important, as they are the largest and most powerful muscle group in the body. If your glutes don't activate when running or other complex athletic activity, you have much less force production and stability, so you perform worse and increase your injury risk. You've probably heard about the importance of "activating the glutes" for running and side-to-side athletic activities. Tiger Woods once famously withdrew from a 2015 PGA Tour event in San Diego, complaining that his, "glutes weren't activating." He was ridiculed for the excuse by the uninformed golf media, but he knew that glute dysfunction put him at increased risk of trauma to his delicate lower back when he was trying to generate over 100mph in clubhead speed through efficient and safe generation of rotational kinetic energy.

Encasing the toes into a single chamber, even a generously wide toe box that many minimalist shoes feature, significantly inhibits their ability to function optimally. Besides interfering with the big toe's important dynamic range of motion in the windlass mechanism, we can also look at the incredible prevalence of blisters, corns, bunions, osteomas, and hammer toe, as well as debilitating arthritis and tendinosis.



"Peluva's generous padding allows for vastly more comfortable, versatile, and safe use for a variety of activities."

To get a little taste of the benefits of articulated toes, don your Peluvas and assume a plank position for 30 seconds. Notice how your toes dorsiflex significantly to provide a stable base for your bodyweight, and how your toes and arch make constant subtle adjustments to keep your balance as you fatigue. Now find a rocky surface to walk across wearing Peluvas. Notice when you land on unstable terrain how the relevant toe or toes will dorsiflex to help you absorb the impact gracefully and keep your balance. Even if you encounter a gnarly protruding object like a rock, branch, pine cone or something slippery, your foot reacts much better than it does in bulky shoes. If you've ever turned an ankle when hiking or jogging on a trail, you can understand how being perched atop an elevated, restrictive shoe is far more precarious than being connected closely to the ground with every step.



ZERO DROP, WITH EXTRA PADDING: A flat sole is essential to enable appropriate shock absorption, balance, and propulsion when walking or running. However, switching abruptly from a cushioned, restricted, elevated shoe can be a challenge because often the foot and Achilles tendon are not resilient enough to handle the unfamiliar (yet anatomically correct) positioning and range of motion. Peluva makes a strategic compromise by offering a five-toe, zero-drop shoe, but with a generous nine millimeters of padding from heel to toe (in the Strand model that's recommended for outdoor fitness endeavors.) This enables a more graceful and safe transition into Peluvas—and vastly more versatile usage—when coming off of a lifetime in traditional shoes.

Peluva's generous padding contrasts the early five-toe shoe offerings (circa 2005) that had extremely thin padding, typically only three millimeters. Early five-toe shoes represented a fantastic innovation in footwear, but represented too extreme of a transition for those coming from a lifetime in elevated, cushioned, restrictive shoes. Many potentially useful applications were essentially off-limits, such as taking a long trail hike on rough terrain or playing a side-to-side sport like pickleball. Many joggers who hastily switched over to these flimsy models sustained overuse injuries, and a class-action lawsuit was filed in 2012 about the matter. The lawsuit blaming the shoes for injuries seems ridiculous, as the shoes were clearly less supportive than regular running shoes and obviously warranted more cautious use. However, the widely-publicized legal case generated bad publicity for the minimalist shoe movement, and the five-toe articulated shoe faded from popularity.



Yes, these are real shoes...

The running community is still reeling from the fallout. Many people have been intimidated by the concept of minimalist footwear in general, and many others have been brainwashed by conventional wisdom to worship big shoe propaganda terms like "motion control," "stability," "neutral protective", "maximum cushion," and more. The marketing hype luring us into big shoes would be humorous if there weren't so many well-intentioned joggers and runners getting chronically injured. Take the concept of "shoe mileage" for example, where we're informed that after 250 miles of use, a shoe's foamy midsole will compress and lose its ability to protect you. Hence, runners dutifully log not only their own mileage, but the mileage of specific shoes so they can head to the store quickly and replenish their "pro-

tection" with a new pair. We hear dire warnings that "over-pronation" is a big injury risk, while de-emphasizing the fact that the pronation of the foot during the running stride is the key to efficient shock absorption, stability, and energy transfer for an explosive takeoff.

SAFETY: Ultimately, shoes that offer the most authentic barefoot-style experience offer the most potential benefits. However, if consumers are poorly adapted and at increased risk of injury, they will be constrained to narrow potential usage and their minimalist footwear journeys will fall short of potential. This pretty much describes virtually all modern humans with decades of experience in brace and encase shoes! This also includes high-performing athletes, who can be some of the least adapted and most damaged by constrictive footwear. In this article on Stack.com titled, "17 Gnarly Sports Feet You Cannot Unsee," you can browse some incredibly squashed and disfigured feet belonging to top athletes like LeBron James, Shaquille O'Neal, Usain Bolt, Deion Sanders, and others.

Hence, after extensive research and development that lasted nearly three years, we brought to market the best of all worlds: a five-toe, zero-drop shoe that has sufficient protection to be ideal for all manner of active living. We talk about modeling the lifestyle behaviors of our primal ancestors to promote health, but our ancestors didn't have pavement or hard indoor floors to challenge their bare or barely covered feet. They generally walked on compacted savannah grass, sand, snow, or other forgiving natural surfaces. Consequently, our mission in designing the Peluvas was to simulate, 'walking barefoot on a putting green."

> ***"The Peluva shoe is designed to simulate walking barefoot on a putting green."***

Consequently, we strongly advocate a patient and sensible approach to transitioning out of bulky, constrictive shoes to a more barefoot-oriented lifestyle. You may have heard the Mark Sisson interview quip, "Don't run in these shoes!" He means certainly not right away, but if you can spend more time in everyday life barefoot or in Peluvas, you will strengthen your feet and reawaken optimal kinetic chain function without the risks associated with abrupt shoe changes. You can still do your endurance runs and specialized sporting activities in your preferred shoes as you strive to continually progress away from cushy shoes and toward a barefoot-oriented lifestyle. Like

many of our most devoted Peluva enthusiasts, you'll soon be able to safely enjoy an increasing variety of fitness activities with great success, enjoyment, improved performance, and reduced injury risk. You may never want to run long distances or do high-impact sprinting in Peluvas, and that's okay. It's about getting your feet stronger and more functional general, which will allow for better performance in whatever shoes you wear.

A PELUVA PROMISE... WITH SOME DISCLAIMERS AND CAVEATS!

The idea of rejecting the extremely popular brace and encase running shoes for a *foot glove* (that's what "peluva" means in Portuguese by the way!) is a highly sensitive subject, so we want to be extremely careful making proclamations that switching over to Peluvas or other minimalist shoes from a long stint in traditional running shoes is going to be all cotton candy and rainbows. There are many challenges associated with extricating from the cushioned shoe paradigm, and you must always proceed with caution, restraint, and patience.

If you get excited about your Peluvas and do some adventures that result in tightness or pain anywhere in the lower extremities afterward, this indicates micro-traumas likely associated with an abrupt shift in footwear. Post-exercise issues are a signal to slow down the pace of your transition efforts and perhaps do the next few workouts or outings in your familiar shoes.

Please don't misinterpret these disclaimers to think that Peluvas are best for super fit enthusiasts. Actually, a devoted transition to Peluvas and barefoot-inspired living in general can be highly beneficial to novices who have less musculoskeletal resiliency and greater injury risks from active endeavors. Besides, no less an authority than Dr. Lieberman asserts that anyone can do it! "People who don't wear shoes when they run have an astonishingly different [foot] strike...Most people today [in the United States] think barefoot running is dangerous and hurts, [but] you can run barefoot on the world's hardest surfaces without the slightest discomfort and pain. All you need are a few calluses to avoid roughing up the skin of the foot." The forthcoming transition protocols for novice, intermediate and advanced enthusiasts will help you transition safely and sensibly.

FLEXIBLE: While the padding on Peluva is ample, you will notice that our customized low-durometer EVA midsoles (the soft rubber-like material that comprises the white area of the sole) allow for extreme flexibility throughout the sole. You can grab a Peluva shoe and easily squeeze it into a ball. The sturdy rubber outsole material that typically covers the entire bottom of athletic shoes (aka "tread") is added only at strategic wear points on Peluvas—each toe, the heel, and other pieces for metatarsal, arch line, and outer foot. This construction offers the best of padding, protection, and durability while allowing the foot to go through its natural dynamic range of motion. In contrast, a rigid sole—something that many traditional shoes tout as a feature (especially with hiking shoes), limits the dynamic movement of the foot. Essentially, you change your stride from human to robot.

FASHIONABLE: Peluvas actually look stylish and appropriate for things beyond the workout-specific use that previous five-toe shoes were designed for. Many of our users report that they get comments everywhere they go from bystanders impressed by the sleek and unique appearance of the shoes. While it's definitely cool for your footwear to turn heads, Peluva's stylish look is important because it encourages you to wear the shoes as often as possible in everyday life. Remember, our ultimate dream is for you to replace most of your existing footwear with Peluvas to optimize your posture and stride mechanics for standing, walking, and running, minimize impact trauma to muscles and connective tissue, and bring your bare feet back to the forefront. You can't underestimate the importance of looking good and feeling good in your forward-thinking footwear, because that will drive long-term habit formation.





WHAT'S A RUNNER **TO DO?**

As you learn about the disastrous effects of heel-striking that's prompted largely by running in elevated, cushioned shoes, we don't want you to get the wrong idea that we at Peluva are staunch anti-shoe conspirators. It's important to acknowledge that traditional running shoes meet an immediate need of providing a very comfortable running experience to a population of people who may be minimally active otherwise, and have spent decades in restricted, cushy shoes. The widespread popularity of super-cushioned shoes like Hoka reveals that many joggers and runners who train sensibly, spend time doing flexibility/mobility work, and lead an active lifestyle can establish a good track record using big shoes. If everything is working for you and you have no aches and pains or overuse injuries, well that's great.

"50 percent of regular runners get injured ever year, 25 percent of runners are injured at any given time, heel-strikers are injured twice as often, and injury rates have not dropped despite decades of shoe 'innovations'"

That said, the overall injury rate in the running community is stunning and embarrassing. Research referenced by Harvard University in 2016 suggests that between 30 and 75 percent of all runners are injured every year! The Yale University Medicine newsletter reports that over 50 percent of regular runners get injured every year. A systematic review of research published in Science Direct confirms that half of all runners get injured every year, and 25 percent of runners are injured at any given time. *Twenty-five percent!* When you consider that none of these folks are getting tackled on their running routes, it's clear that there is a massive problem on the scene. Can you imagine if the NFL, NBA, or English Premier League had 25 percent of their players sidelined at any given time? There would be a major outcry from fans and players alike!

Experts blame a variety of reasons for the alarming rate of overuse injuries, including structural weaknesses and imbalances, overly ambitious increases in mileage, too many high-intensity training sessions, excess body weight, and yes—modern running shoes. Dr. Lieberman led research in 2012 revealing that heel-strikers (a technique made possible only with modern running shoes) were injured twice as much as natural midfoot/forefoot

strikers. To be clear, elevated, cushioned shoes do not cause technique errors like heel striking. In truth, they enable poor technique by removing the immediate and severe penalty of excessive impact trauma, and enabling a poorly adapted person to log many miles that they simply couldn't manage without elevated, cushioned shoes.

Why don't we just naturally execute a proper midfoot strike as humans are designed for? Well, there are an assortment of reasons that novice and/or poorly adapted joggers have the inclination to heel strike and overstride, including: an inefficiently slow cadence; insufficient forward lean of the trunk (experts recommend hinging forward 8-10 degrees from the hip, keeping spine straight of course) and/or insufficient forward lean of the ankles; poor glute activation (from weak glutes and also from lack of forward lean); poor hip extension on the push off phase (due to weak and/or tight hip flexors, prompted by sitting all day); and a tendency for "contralateral pelvic drop", where the airborne hip drops below the hip contacting the ground during the running stride. A 2018 study in the American Journal of Sports Medicine revealed that each degree of hip drop increased injury risk by 80 percent. By wearing cushioned shoes, those ill-adapted for running allow the nightmare of a jarring, braking, heel-strike overstriding to come true.

Understand that you can work to improve your running technique wearing any kind of shoe. Start by being more mindful of every footstrike and also integrate functional fitness activities such as strength training and flexibility, mobility, pre-hab and rehab exercises. When you start getting good at executing midfoot landings in your elevated, cushioned shoe, you'll realize that you don't really need the extra padding. You can make progress on parallel tracks here by both improving technique and integrating more minimalist footwear for a small, and then increasing, percentage of your weekly mileage. The Runners Transition protocol presented shortly will describe how to do this strategically.

TRANSITIONING SAFELY **TO A MORE BAREFOOT AND MINIMALIST SHOE LIFESTYLE**

Our goal at Peluva is to get you enjoying these shoes as your first choice for routine everyday life, including walking, working, socializing, and doing light fitness activities—especially strength training and group exercise classes in the gym. Since our launch in 2023, we have received feedback from many devoted users explaining how their Peluvas have replaced numerous other pairs of leisure and active lifestyle shoes. One customer recounted in detail how his Peluva Strand's have replaced 20 different pairs of leisure and fitness-type shoes--*twenty*! Included in the message was an itemized list of the shoes his Peluvas have more or less replaced: Goodbye to colorful Air Jordans, Birkenstocks and Crocs used for walking around town; beach flip-flops, slider sandals, and strap-on sport sandals; cheap Amazon slip-on sport shoes used for long drives and airplane flights; a wide toe box minimalist athletic pair and a leisure pair; lightweight high top hiking boots with a rigid sole; an old pair of the original five-toe minimalist shoes rarely used due to lack of padding; and so forth.

He then proceeded to instruct us about what new models we needed to develop to meet his few remaining footwear needs: A warm, waterproof winter shoe (working on it!), and a sturdier, more grippy Strand-type shoe intended for trail hikes (Peluva ATR, launched in 2024!) Many customers have shared that they'll "never go back" to elevated shoes with compressed toe boxes after realizing how comfortable it is to let your feet be feet in Peluvas.



Replace many of your favorite athletic and active lifestyle shoes with Peluvas, and your feet will thank you.

The Peluva ATR has extra tread and lateral support for: high-impact fitness activity, hiking, and other adventures.



The most urgent transition goal is to get you walking more in Peluvas and spending as much time barefoot as possible. This will help your feet get stronger and more resilient for anything you do and any specialized shoes you choose to wear. Over time, with stronger, more functional feet, you can aspire to use Peluvas for even advanced activities such as epic hikes—even on rough terrain; sprint drills and wind sprints, side-to-side sports like pickleball, tennis, Ultimate Frisbee, and CrossFit; and even golf practice and in some cases jogging. That said, you must operate with a "safety first" ethos at all times, and proceed at your own pace on this journey. We have created a few different step-by-step action plans to help you safely transition to a more barefoot-inspired lifestyle, with the tiers based upon your current level of activity and foot functionality. The levels presented are:

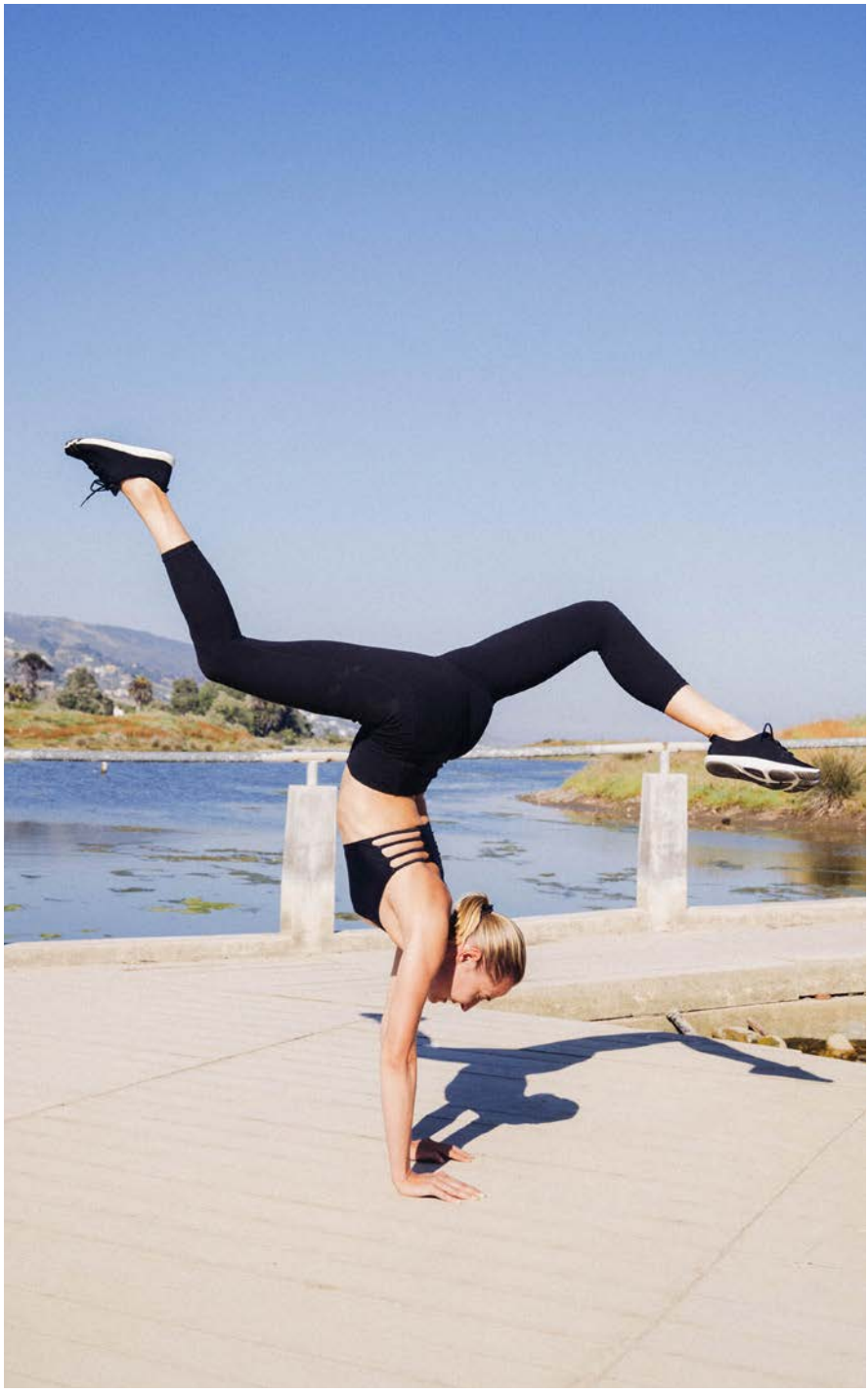
WALKING–THE FIRST STEPS: Walking is the centerpiece of living a healthy, happy lifestyle and one of the most essential human genetic expectations for health. We'll help you implement creative ways to up your overall walking game

NOVICE: Best for those who are minimally active, at a lower fitness level, and/or with existing foot weakness or problems

INTERMEDIATE: Best for those leading active lifestyles, good overall fitness competency, but with little or no experience with minimalist shoes or barefoot time

ADVANCED: Best for those who are highly fit and active, and/or have significant experience with minimalist shoes or barefoot time.

As you progress through the recommended protocols, realize that your efforts will dramatically improve your functionality for all the occasions



when it's necessary to wear specialized shoes, such as wearing heels for fashion, working construction, playing basketball, and so forth. We could mention office customs mandating the use of traditional dress shoes, but I'm compelled to challenge that "excuse" at this point in the human evolutionary timeline. If your use of minimalist shoes is frowned upon in an office environment devoid of physical labor or foot hazards, it could be time to advocate for your personal freedom; talk to human resources about the reasonable accommodations that most companies and countries around the world honor; and perhaps find a cool physician to give you a "doctor's note" in support of your foot health. If those fail, it might be time to look for a new job!

Taking your feet out of their high-tech protective cocoons in the name of relieving pain and lessening impact trauma might seem counterintuitive at first glance. It's similar to the Primal Endurance pillar of, "Slow down your endurance workouts to get faster." However, as many enthusiasts of the burgeoning barefoot movement have discovered, going barefoot can generate quick and dramatic improvements in coordination, agility, balance, posture, and movement technique. Barefoot enthusiasts who make a successful transition also report relief from all manner of pain and chronic injuries to the lower extremities. It's best to see for yourself by spending a little time in Peluvas and seeing how your feet, and other musculoskeletal aches and pains, start to improve. The key is to take things slowly so you experience nothing but improvement and strengthening, and to not overstress your feet with too abrupt of a transition.

Walking - The First Steps!

Walking barefoot or in Peluvas is not only the best way to improve foot functionality, it's the centerpiece of a healthy, active lifestyle in general. While adhering to a devoted fitness regimen is beneficial for longevity and minimizing disease risk, many fitness experts now contend that increasing all forms of general everyday movement is the single most important health intervention you can do—more important than sweating it out at the gym regularly. We are hoping that your Peluvas will serve as a catalyst to bring walking to center stage in your daily routine. The shoes are comfortable, stylish, and extremely functional such that you will awaken to the inherent pleasure of moving your body through space using the quintessential form of human locomotion that is walking.



Granted, you are going to have to overcome some major momentum against walking that exists in our comfortable, convenient, lazy-oriented modern life. Some of us may be hindered by adverse weather conditions at certain times of the day and year, or unsafe walking conditions in certain urban environments or rural roads. Even if you live in an ideal walking environment, it's easy to fall short of optimal daily steps due to non-stop opportunities for transportation convenience and cultural norms that discourage walking.

Evolutionary anthropologists contend that walking is not just how we got around for millennia, but is a critical element of the *Homo sapiens* metabolic, hormonal, and cognitive systems. We have a genetic imperative to be engaged in near-constant low-intensity movement throughout the day in order to be healthy. This has been hardwired through 2 million years of evolutionary selection pressure. Moving supports the complex and synchronous interactions between organs and systems throughout the body that make us healthy, strong, resilient, and adaptable to all manner of everyday life stress.

For perspective, consider the contrasting genetic imperative of the *Panthera leo*—the African lion—who has evolved to sleep or rest for an average of 21 hours a day. This conversation of energy (especially during the heat of the day, since lions have poor cooling mechanisms) allows these apex predators to launch powerful, explosive and brief all-out attacks on prey when the time is right. After a big feast, lions are known to crash out for up to 24

hours! The lion sleeping her days away and feasting occasionally is a lion living her best life. Living our best life entails a concerted effort to putting one foot in front of the other to minimize the negative effects of commuting, office work, and leisure time screen entertainment.



Homo sapiens ***are adapted to be in near-constant everyday movement. Leave laziness to the lions!***



Walking offers an assortment of health benefits, including improving your cognitive function, fat metabolism, mood, and overall energy levels. Even a short walk to start your morning or take a midday work break will boost mood-elevating hormones like dopamine, serotonin, and norepinephrine. Regular walking helps boost the production of an important protein called brain-derived neurotrophic factor (BDNF). BDNF has been shown to help improve neuron firing and build new neurons, increase blood circulation and oxygen delivery, help prevent cognitive decline, alleviate symptoms of depression and anxiety, and improve plasticity—making your brain more resilient against stress. Harvard psychiatrist John J. Ratey, MD, calls BDNF "Miracle-Gro for the brain."

A walking-oriented lifestyle has a direct correlation with improved brain function and prevention of cognitive decline. Regular walking helps the hippocampus and other areas of the brain grow thicker, indicating better memory formation and consolidation, and more resilience against cognitive decline. A 2017 UCLA study comparing MRI scans revealed that active older folks (over 60, and walking more than three kilometers per day) have faster brain processing speed, better working memory for quick decisions, and better memory consolidation than inactive folks. In his book, *The Real Happy Pill: Power Up Your Brain by Moving Your Body*, Swedish

researcher Dr. Anders Hansen reports that taking a daily walk can reduce your risk of dementia by 40 percent. If you fail to achieve a bare minimum of walking and basic muscular activity each day, you are most definitely headed for pain, suffering, and demise. In the UCLA study, those falling short of the 4,000 steps per day had thinner brains, slower, less-efficient functioning, and greater risk of accelerated decline.

In the 2009 bestseller, *The Primal Blueprint*, I presented the ten Primal Blueprint laws that represent our human genetic expectations for health. Our minds and bodies require these inputs in order to function optimally. This means walking is not an optional activity for achieving a fitness boost (like a specific workout protocol), but rather a mandatory behavior to prompt the genetic signaling for health—and prevent the shrinking of your brain, body, and spirit from the health-destructive genetic disconnect of a sedentary-dominant lifestyle. Go ahead and pursue goals like 5,000 or 10,000 steps a day if you like, but I also urge to you to make a fundamental shift in your beliefs and behavior patterns to consider walking as non-negotiable as sleep.

Research with the Hadza, modern-day hunter-gatherers living in Tanzania, reveals that they are in near-constant motion throughout the day. Males cover around seven miles a day tracking game (at a varied pace, including lots of rest time, steady walking, faster jogging, and occasional sprinting). Females cover around three miles a day, and are very busy with other general activities such as gathering food and tending to young. Our ancestors lived for millions of years in a state of near-constant movement, until things came screeching to a halt only in the past couple generations of the technological age. Even your grandparents likely walked and moved vastly more than we do today, and today's children likely move vastly less than their parents did.

When our days are characterized by prolonged periods of stillness, our bodies stop working well on many levels. Research suggests that just 20 minutes of sitting can generate a noticeable decline in glucose tolerance and an increase in insulin resistance. Brain performance experts report that we are only able to truly focus on a peak cognitive task for around 20 minutes before our cognitive function declines and we require a break. Walking outdoors in fresh air and open space is the most restorative break in many ways. If we insist on plugging away at the screen per modern office customs,

we will start to lose focus, become less efficient, and more inclined to distraction. We might indeed be "busy" at our desks for hours on end, but not engaging our peak cognitive powers or improving our skills. We are stuck in what British performance scientist James Hewitt calls the, "cognitive middle gear." Accordingly, we tend to follow what Hewitt calls the, "principle of least resistance"—working on stuff that's easiest to accomplish in the moment (can you say, "email inbox?")



There are many creative ways to increase general everyday movement without cramping your style. For example, taking phone calls on the move during the workday

In a 2009 book called *Rapt: Attention And The Focused Life,* author Winifred Gallagher argues that the skillful management of attention is the key to happiness. We need to walk to manage our energy and attention to ultimately enjoy a happy, meaningful life. Today, it seems like all of us deserve to make a shift in mentality and behavior patterns to realize that walking is essential to health, and to commit to a walking-oriented daily routine. This may not be easy amidst today's norms of comfort, convenience, and sedentary-dominant lifestyles. It's likely that you are going to have orchestrate intentional walking opportunities in daily life in order to extricate from all the momentum toward comfort, convenience, and stillness that we face today. Some of these suggestions might seem silly, but they are absolutely necessary and highly effective. When you orchestrate opportunities to walk every day, you will soon bring walking into the category of habit instead of hassle. It will soon seem more natural to walk places instead of drive, or take stairs instead of elevators. It's time to get up and put one Peluva in front of the other every day in the name of health and happiness! Following are some suggestions to manufacture walking opportunities in everyday life.

MORNING STROLL: The best time to form an empowering new daily habit is first thing in the morning, and the best way to feel naturally refreshed and energized in the morning is to get outdoors for some physical

movement. While the idea of getting out of bed and immediately outdoors for a walk may not be appealing to many who are accustomed to gradual starts featuring coffee and crossword puzzles, a first-thing morning stroll can become a very enjoyable and productive habit. Start small with a commitment to get up and walk around the block for five minutes.

HIGHER PURPOSE: See if you can transcend the fickle forces of motivation and will power and make a walking commitment that's bigger than you. If you're a dog owner, honor your obligation to properly care for the animal by setting a time every morning and/or every evening for a regular outing. Dogs have such a finely tuned circadian rhythm and sense of routine that they will soon be scratching at the door at typical walk time. Those faces are hard to turn down just because you don't feel like it! If you have children, put their human genetic expectations for health at the forefront of your lifestyle priorities and get them walking every day. If you live too far from school to walk, park a mile away and walk it in. Every day!



How can you turn down a walk with a highly motivated dog?

ORCHESTRATED OBLIGATORY WALKING: Beware the momentum of your comfortable home or office environment and stop for a walk before you arrive at your destination. Find a park on your commute route, stop there and complete a lap, and then resume your journey. If you take the bus or the subway, walk to the next stop before boarding. Use walking as incentive to travel to a dessert shop, farmers market, or other appealing des-

tination. See if you can find resources in your community where you can do assorted errands on foot, such as a nearby market, post office, or bank. If you typically drive to a central urban area for shopping and errands, consider parking a mile away and switching over to walking to complete your appointed rounds.

DON'T BE A MUPPET: Andre Obradovic, Australian health and executive coach and serious amateur triathlete, uses the term "muppet" for someone who is content to follow the pack without engaging any competitive focus or critical thinking. Resolve to not be a parking lot muppet, where you reflexively troll for the absolute closest possible parking spot at the shopping center. Instead, enter the parking lot, turn away from the building, and claim the farthest possible spot from the store. Every time. You'll get fewer door dings, too!



Don't be an elevator muppet—make it a practice to avoid or minimize elevator use and take the stairs instead. No excuses! If you're going 30 floors, get off at 23 and hoof it the last seven. Don't be a fitness muppet, where you follow a devoted workout regimen but lead an otherwise lazy life because you feel deserving thanks to your impressive workout log entries. Realize that walking and other forms of gentle movement actually speed recovery from hard workouts better than complete rest. In the hours after a strenuous session, you might actually resolve to get a bit more walking and dynamic stretching in to help improve blood circulation, speed removal of waste products and better manage post-workout inflammation.

Research is compelling that when you increase walking and general everyday movement, and minimize prolonged periods of stillness, you can rewire your brain to become more naturally and spontaneously active. Increasing your baseline activity level will enhance fat metabolism and regulate appetite and satiety such that walking might be considered one of the best ways to achieve and maintain your ideal bodyweight. That's right, it's not about burning crazy calories and killer workouts, because the body engages in an assortment of compensations to conserve energy after strenuous workouts. Movement is the key to hormone optimization that leads to natural weight control.

Transition Protocol - Novice

If you have hesitations about your potential for a barefoot-dominant lifestyle, you can take comfort knowing that the Novice protocols will work for you. Within these recommendations is plenty of flexibility to proceed at a comfortable and sustainable pace, and safeguards to make sure you don't overdo it.

LET YOUR FEET BE FEET: It's time to take your shoes off and start walking around the house! Tune into the concept of proprioception and notice how incredibly sensitive and reactive your feet are to the ground. Try standing on one foot for a bit and notice how the delicate small muscles of your foot kick into high gear to help support your weight. These are the inherent human skills and attributes that you have suppressed and atrophied with bulky shoes. If you are unaccustomed to walking around barefoot, make a concerted effort to spend a couple hours a day barefoot, including walking around the home. If your feet get cold, consider using the individual toe socks we offer at Peluva.com or try the popular brand Injinji.com. Over time, strive to make barefoot the norm in your home.

WEAR PELUVAS IN EVERYDAY LIFE: In tandem with more barefoot time at home, you can put on your Peluvas for more extensive movement in everyday life. This might mean going to the supermarket or doing other errands, or perhaps wearing them to your workplace, or puttering around in your yard. The nine millimeters of cushion (Strand model) will make the Peluvas a more comfortable option indoors, and of course a viable option for use outdoors.

SHORT WALKS IN PELUVAS: Leash up the dog and take a walk around the block or around the path at the park. A ten-minute walk is a sensible starting point for all but the most foot-compromised folks. And here is the key: see how your feet feel the next day, and the day after (sometimes it takes up to 48 hours to experience post-activity muscle soreness.). If you experience any soreness in the heel, arch, toes, or calf muscles from the unfamiliar footwear, this suggests that you'll want to go slowly with your transition. If you feel fine after your first formal outing, you can proceed through the protocol at a more ambitious pace.

NEXT-DAY SORENESS: Wait 1-3 days until you have no soreness before wearing Peluvas again. After your next short walk, check again for next-day soreness and follow the same protocol.

NO SORENESS: Start wearing your Peluvas as much as possible during the day, and strive to take a short walk daily, or at least several times per week.

30-DAY CHECKPOINT: After 30 days of honoring the first three suggestions, you should feel like your feet are much more resilient, and that you can walk comfortably for 10, 15, or 30 minutes several days a week. If it takes 60 days to arrive at this description, proceed gradually until you feel like you have reached this milestone. Any time you experience next-day soreness in the lower extremities, you want to reign things in and wait a day or more until resuming your shoe transition efforts

FOOT EXERCISES: Refer to the section about Foot Exercises and start integrating these into your routine. Spent a few minutes a few days a week doing the exercises to support your continued progress.

Transition Protocol - Intermediate

An intermediate starting point implies that you don't have any existing foot problems, lead an active, energetic lifestyle, and have some decent experience moving with bare feet or doing moderate exercise in minimalist shoes. *Note*: Soreness is the key guideline to govern your rate of progress. If you ever experience post-activity soreness that you attribute to your footwear, wait until you are completely clear of soreness until trying additional challenges. When you complete everything listed on the Intermediate Protocols, you can make a foray into the Advanced Protocols.

LET YOUR FEET BE FEET: The first step is to default to barefoot in your home. If your feet get cold, consider using the individual toe socks we offer at Peluva.com or try the popular brand Injinji.com. Tune into the concept of proprioception and notice how incredibly sensitive and reactive your feet are to the ground. Try standing on one foot for a bit and notice how the delicate small muscles of your foot kick into high gear to help support your weight. These are the inherent human skills and attributes that you have suppressed and atrophied with bulky shoes!

FOOT EXERCISES: Refer to the Foot Exercises section and start integrating these into your routine. Spent a few minutes a few days a week doing the exercises to support your continued progress.

EVERYDAY LIFE: In tandem with your barefoot in the home strategy, strive to wear your Peluvas as much as possible in everyday life. This means shopping, errands, the workplace if possible, and for basic outside activity.

WALKING: Take a walk of 10-30 minutes in your Peluvas. See how your feet feel the next day, and the day after (sometimes it takes up to 48 hours to experience post-activity muscle soreness.). If you experience any soreness in the heel, arch, toes, or calf muscles after your introductory walks, refrain from extended walks until the soreness clears. Then, try a shorter walk than your first one and build carefully from there.

REGULAR WALKS IN PELUVAS: In addition to your baseline of wearing Peluvas as much as possible in daily life, strive to walk for 10-30 minutes in Peluvas several days a week. With success on these outings, you can start attempting more ambitious fitness activities.

GYM WORKOUTS: Wear your Peluvas for a low- or no-impact gym workouts such as a strength training session; group workout like Step, Barré, or other aerobics-type class; home-based workouts like Tonal or Lululemon Mirror; or a CrossFit-type metabolic conditioning class. If you are contemplating a workout that has extensive side-to-side movement, such as a typical CrossFit session, it's best to complete some less demanding workouts first. Notice how you have heightened proprioception when performing exercises like the deadlift, or doing anything that requires balance or impact absorption, such as box jumps or working with TRX straps. Monitor for post-workout soreness, but hopefully Peluvas will become your go-to footwear choice in the gym.

HIKE: Try a trail hike in Peluvas. You can start modestly with an outing of medium duration on comfortable terrain, but you should soon be well-adapted for a challenging hike on rough terrain.

Transition Protocol - Advanced

An advanced starting point implies that you have strong feet, lead a very active, energetic lifestyle, and have significant experience moving in bare feet and exercising in minimalist shoes. Perhaps you have already transitioned over to zero-drop shoes for jogging and running, routinely wear minimalist shoes to the gym, or wear minimalist sandals on long walks. Even from an advanced starting point, we urge you to progress sensibly, and always be on

the alert for post-activity soreness that will necessitate rest before attempting further challenging activities.

The Novice and Intermediate Protocols detail some important progressions to get your feet more resilient for the complex activities presented in this section. Consequently, the following protocols include some recaps of Novice and Intermediate progressions for your review. Hopefully you will be confident that you already implemented these behaviors and/or reached these milestones. Perhaps you see some suggestions that you might want to pay more attention to, even as you jump into some bigger challenges.

BAREFOOT IN THE HOME: Barefoot should be the default state inside the home. If you're used to shuffling around in slippers in the winter, consider using the individual toe socks we offer at Peluva.com or try the popular brand Injinji.com.

FOOT EXERCISES: Refer to the section about Foot Exercises and start integrating these into your routine. Spent a few minutes doing exercises a few days a week to support your continued progress.

EVERYDAY LIFE: Wear Peluvas as much as possible in everyday life. Hopefully you are walking a significant number of steps as part of your daily routine, and can make a special effort to get your walking done in Peluvas. A foundation of daily walking is critical to your continued success doing more complex fitness endeavors in Peluvas, and your barefoot competency in general. You don't want to repeat the mistake of the early minimalist shoe movement where people wore regular shoes all day long and then tried to bust out 10k runs wearing shoes they were poorly-adapted to. We'd rather you spend tons of time in Peluvas doing this and that every day before you worry about wearing them in a pickleball tournament or on a long run.

GYM WORKOUTS: Peluvas should absolutely be your go-to footwear for all manner of gym activities. The improvement in proprioception is critical for heavy lifting, any classes or exercises requiring balance, and even medium-impact exercises like box jumps or CrossFit type classes. Even if you are used to wearing zero-drop, flexible shoes in the gym, consider a switch to Peluvas so you can get your individual toe articulation going during complex gym exercises.

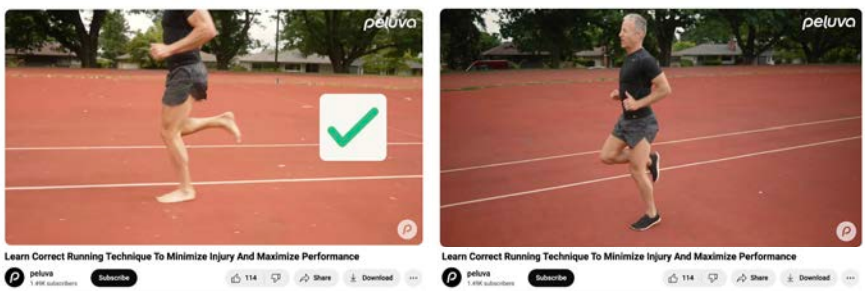
HIKING: Believe it or not, Peluvas can be your go-to hiking shoes even for the most challenging terrain. This is especially true with the 2024 launch of our ATR model designed especially for trail use. While we have long been programmed to believe that a good hiking shoe requires a thick, very rigid sole and an elevated heel to safely negotiate trail obstacles, you are actually safer and more functional using a flexible, flat, five-toe shoe that can deftly navigate across even the most rugged trails. Amazingly, the impact trauma you absorb in hiking boots vastly exceeds what you experience wearing Peluvas, because the impact of your bodyweight when wearing a rigid, unforgiving sole gets dispersed inappropriately throughout your lower extremities. A stiff hiking shoe delivers a jarring ride on rough terrain.



In contrast, even when you walk across an extremely rough rock bed in Peluvas, each step will be deftly negotiated by the articulation of the toes and the dynamic movement of the foot to orient for a graceful impact on uneven terrain. Granted, you will need significant experience to transition over to extreme hiking in Peluvas, so start with less daunting terrain and get some experience with dynamic foot placement and impact absorption over challenging terrain.

CHALLENGING HIKE: After 2-4 good hikes on comfortable terrain, go looking for a more challenging hike to give your Peluvas a full test! You will be amazed at the functionality of Peluvas to help you proceed over roots, rocks and other obstacles by gracefully absorbing the uneven landings without the typical instability and falling risk that comes with bulky, rigid hiking or trail running shoes. Check out the video on the Peluva YouTube channel titled, "Brad Kearns Cactus-to-Clouds," where Brad chronicles his ascent of the single most difficult hiking trail in the USA (8,400' ascent in 9.5 miles in Palm Springs, CA) wearing the Peluva Strand shoe. Granted, if you are a competitive trail runner trying to negotiate rough terrain at significant speed, you may be better off with the extra protection provided by a good trail shoe (hopefully a minimalist one.)

RUNNING TECHNIQUE DRILLS: Check out our Peluva YouTube channel for a variety of running technique drills that can help you learn the most efficient running technique. The great thing about running technique drills is that you can get a fantastic workout doing challenging drills that are very low, low, or medium impact in comparison to high-impact sprinting. The drills will help you develop correct posture, a balanced center of gravity, efficient impact absorption, and maximum force production per stride. The drills isolate certain segments of the running stride to teach your central nervous system to execute precise technique attributes when running at high speed.



Since most of the drills are low impact, they can be done safely in Peluvas—even for a novice user (sticking to basic drills.) What's more, it's essential for you to wear Peluvas for the technique drills because they allow your feet to operate in an anatomically correct manner. This cannot happen in elevated, cushioned shoes—even if you perform great drills with precision. We

present both basic and advanced drills on the website, so you can start with drills that minimize impact trauma and are easy to learn, and progress to more challenging drills. Accumulate 3-6 successful workouts before trying the next level of drills.

LOWER-IMPACT, HIGH INTENSITY EXERCISE: Use your Peluvas for sprints on stairs or hills, pushing a heavy sled, or doing other challenging high-intensity efforts that are relatively low impact when compared to sprinting or complex side-to-side activities.

JOGGING/RUNNING: If applicable, consider the runner's protocol that follows, to gradually and safely progress toward a more minimalist running experience

Transition Protocol – Runners

If you wish to transition from reliance on cushioned shoes to a more minimalist experience as a runner, you must implement a multi-faceted strategy where you go barefoot as often as possible, walk in Peluvas as often as possible in daily life, and implement the suggestions throughout the Intermediate and Advanced transition protocols. Then, consider acquiring a new pair of running shoes that are further along the continuum of super-cushioned to minimalist. For example, the Nike Free has a very flexible sole, plenty of cushion, and a drop of 4-6 millimeters from heel-to-toe. There are many running shoe models with minimal or zero drop but offering significant protection and lateral stability suitable for trail running. The New Balance Minimus has four millimeters of drop, while the Minimus Zero has zero drop. The Merrell Trail Glove has zero drop, as do Vivo Barefoot running shoes.



When you acquire any new running shoe, start by running just a mile or two at recovery pace on a softer surface such as grass, turf, all-weather running track, or dirt road or trail. If you experience any stiffness or soreness afterward, wait until soreness clears completely, then attempt another session of similar pace and distance, or less. Complete 3-6 short jogs before increasing your distance or trying a harder surface. Strive to work up to running 10 percent of your weekly mileage in your more minimalist model. Over time, you can carefully progress toward running more miles in shoes that are more minimalist.

To reiterate, this journey must be entirely driven by personal preference and subject to positive results. It might seem like too much hassle or too much risk to mess with your trusted shoe models, but it's important to acknowledge that running overuse injuries are driven by poor foot functionality, poor form enabled by cushioned shoes, and increased impact trauma caused by running with poor form in cushioned shoes. It's essential to strive to improve your form and achieve graceful midfoot landings, which will minimize the need for elevated, cushioned shoes and tee you up for success with integrating more minimalist models.

Remember, there is no obligation to progress all the way to the end of the running shoe continuum (which it seems would be Abebe Bikila territory!), and many runners tend to discover and stick with their favorite shoe models. For this reason, we don't recommend Peluvas for long distance running, and prefer to emphasize the goal of spending as much time as possible walking in Peluvas and wearing them in daily life. This will help your feet before more resilient and functional when you do wear specialized athletic shoes, including super-cushioned shoes, regular cushioned shoes, carbon plated super shoes, or minimalist shoes. Just get that midfoot landing perfected! Check out the Peluva YouTube channel for great instruction on running technique and drills you can perform to solidify technique improvements.

Transition Protocol – Really Advanced

High impact running on flat ground represents the biggest challenge and highest level of adaptation with minimalist shoes. When you are successfully progressed through the Advanced Protocol and want to try high impact running Peluvas, start conservatively and assess how your feet and lower extremities feel in the days that follow. Even if you've done a ton of hard work

toward a barefoot transition, you can still expect a bit of soreness when you actually sprint.

WIND SPRINTS: A wind sprint is a brief effort where you accelerate up to nearly full speed, then quickly decelerate into a gradual finish. They should last 5-7 seconds and be minimally strenuous. The focus is on executing crisp technique and carefully sensing your muscle firing and motor patterns. You want wind sprints to feel great before attempting more difficult efforts. Wind sprints are also a great stand-alone workout, especially for those trying to gradually build competency for full sprinting. A great starting point is to perform 5-7 wind sprints lasting 5-7 seconds each. See how your body responds in the aftermath and accumulate a few good sessions before considering a full sprint session.

FULL SPRINTS: The optimal template sprint workout is to perform an extensive cardio warmup, extensive dynamic stretching and technique drills, then a main set of 4-8 sprints lasting 10-20 seconds each. Yes, even four sprints of 10 seconds is a fantastic workout! Observe at least a 6:1 rest-to-work ratio. For example, if you are sprinting for 10 seconds, you rest for at least 60 seconds between each effort. It's best to sprint on an athletic field with excellent grass or turf, or on a dirt or rubber running track to minimize impact trauma. The return on investment with sprinting is superior to any other workout for overall fitness competency and body composition goals. However, you must exercise caution and patience at all times.

The main goal for a sprint session is to deliver a *consistent quality of effort* on every rep. If you are running 80-meter sprints on the football field, you want to see a similar finish time and a similar perceived exertion. For example, running 12-second efforts that feel like a 90 out of 100 exertion scale. If you notice your technique faltering, finish in a slower time, or have to try harder to meet your average time, it's time to end the set. Peluvas are great for sprinting because they allow the foot to optimize impact absorption and power generation, while also providing cushion to minimize impact trauma.

COMPLEX ATHLETIC ACTIVITIES: Test our your Peluvas for brief stints doing complex activities that you enjoy. Play a short rally in pickleball or tennis, knowing that you will have your shoes available for the majority of the session. Do some of your basketball dribbling and shooting drills in Peluvas and see how they feel. Hit a couple dozen golf balls on the driv-

ing range, or play games of catch in the park with balls or Frisbee. What you'll notice doing complex side-to-side athletic activities in Peluvas is increased proprioception, quicker ground reaction time, and even less jarring impact. Alas, your feet will also be challenged by less lateral stability, so dynamic activities and sports fall into the really advanced category. For example, using Peluvas on the driving range can help increase your awareness of your balance and weight transfer efficiency. However, a powerful golf swing is best performed in a specially designed golf shoe that has the rigidity and lateral stability (distinct sides that encase the foot,) so Peluvas are not recommended for serious 18-hole rounds.



Similarly, there is a constant danger of foot collision and other foot trauma when playing basketball with others, so wearing a basketball shoe with sufficient protection is a must for players. However, when practicing your skills solo, you will feel more quick and agile in Peluvas, because you are lower to the ground and have the ability to operate the toes individually with better range of motion. Interestingly, you will very likely be able to jump higher in Peluvas than you can in a basketball shoe! This is because you can leverage the full potential of the toes, arch, and Achilles tendon to coil completely and deliver maximum vertical force production upon takeoff, and also because of the weight savings of Peluva compared to a typical shoe.

Complementary Exercises And Therapies

As you adapt to a more barefoot-oriented lifestyle, your feet will become stronger, more resilient, and more adaptable to more complex activities. You will become more resistant to injuries and accidents thanks to the fantastic foundation you provide for all manner of kinetic chain activity throughout the body. Make the most of your efforts to transition to more barefoot and Peluva time by giving your feet other opportunities to strengthen and improve. Here are some great ideas to complement your barefoot and Peluva time:

SELF-MYOFASCIAL RELEASE: Self-myofascial release is the act of "rolling" muscles with a hard foam cylinder or specially designed sticks, domes, and balls for specific body parts. Rolling muscles is intended to improve mobility and range of motion in muscles and nearby joints (you never want to roll directly on joints), increase oxygen delivery and blood circulation, reduce inflammation, speed the removal of metabolic waste products, improve tissue hydration, and enhance the function of the lymphatic system. The lymphatic system is an important detoxification system in the body. It operates via compression mechanisms, so rolling is especially beneficial for lymphatic function.



A devoted rolling session of only 5-10 minutes has been found to increase blood circulation in the involved muscles by 50 percent for up to 30 minutes afterward. Rolling is a great idea to get muscles warm and functional in the morning or before a workout. After workouts or at the end of a long day, rolling is a great way to promote recovery by stimulating parasympathetic activity. The "good hurt" generated by self-myofascial release prompts a flood of calming hormones and neurotransmitters into the bloodstream. In this way, rolling helps bring you down from the sympathetic-dominant state that you were in during a strenuous workout. The rapid pain relief that many experience from a rolling session comes from the activation of mechanoreceptors that mute sensations of pain generated in the central nervous system. This activation of mechanoreceptors also happens when we instinctively rub our arm or head when we bump into something.

The correct protocol for self-myofascial release is to start at the pelvis and roll further away from the center of the body. For example, start with hamstrings, then calves, then feet—skipping past joints always. You want to apply significant pressure as your roll down the length of the muscle. You'll likely experience mild to moderate discomfort. Amazingly, you should aspire to a goal of being able to roll through all the major muscle groups, using significant pressure, without experiencing any discomfort. This is a sign of supple, resilient, high functioning muscles. That's right, grinding your calves up and down a firm cylinder should not cause you to wince in pain! If your calves or other muscle groups are tender and sensitive, this suggests they are tight, inflamed, weak, and/or immobile.

Work with your roller, ball, stick, or power gun at a slow pace, going down for a few seconds, then back for half that time, then down again. You'll likely discover stiff, sensitive spots known as trigger points that represent the origination of injuries and imbalances that might be symptomatic elsewhere. For example, a tight calf muscle might be causal to your inflamed Achilles tendon. The painful IT band syndrome that many runners suffer from typically presents as pain on the outside of the knee, but can be treated by working trigger points higher up on the lateral thigh, where the quads, glutes, or hamstrings connect with the IT band. Note that a direct attempt to loosen the IT band does no good—it's a super-strong tendon capable of absorbing 2,000 pounds of pressure per square inch. It will not contract or stretch even with your hardest efforts. Rather, the idea is to loosen the muscular adhesions to the IT band that will facilitate healing. When you find a trigger point, hold the pressure in one spot for 15 seconds, breathing through the discomfort, and then continue your pattern.

Be sure to devote proper attention to opposing muscle groups, so that you address the cause of pain and dysfunction instead of just treating symptoms. For example, if you have pain in the thoracic spine area from working in hunched-over positions while texting, typing, driving, cycling, and so forth, this can represent muscle imbalances between your chest and back. You may have short, tight chest and shoulder muscles, and weak, loose, and elongated back muscles. Rolling those back muscles will make them even longer and looser, perhaps providing immediate relief but exacerbating the muscle imbalance. Instead, attack the cause by rolling out your pectorals, deltoids, shoulders, and lats. Know the difference between the desirable

pain of working on trigger points and the undesirable pain that comes from overdoing inflamed/injured areas, or hitting nerves, bones, or joints. Be gentle rolling your lower back muscles, because there is minimal muscular protection for the spine in that area.

FOOT MASSAGE: Arch pain and strain is a common complaint, largely driven by wearing elevated, rigid modern shoes. The arch is designed to absorb impact and generate power, and when it's inhibited from its functionality (e.g, the windlass mechanism) by a rigid sole, it can become chronically inflamed and also atrophied. Rolling along the length of the arch with appropriate pressure will help to break up adhesions, relieve muscle tension and tightness, improve blood circulation, improve range of motion, improve neuro-muscular activation, and also strengthen the many muscles on the bottom of the foot. A lacrosse ball is widely regarded as the best choice for foot massage because it's firmer than a tennis ball, has ideal material of semi-firm rubber and oils, and is a perfect size to work the entire length of the foot.



You can sit or stand on a hard surface and place the ball under your arch. Divide your foot into thirds and make some short up and down strokes, then side to side strokes, on the first third of your foot. Spend about 10 seconds, then move to the next section of your foot and repeat the up and down, and side to side strokes for 10 seconds. Finish with the final third of the foot, then repeat the process so you spend around 60 seconds on one foot. Then, switch the ball to the other foot and repeat the 60-second protocol. Bestselling author and Nutritious Movement founder Katy Bowman, MS, recommends rolling on the lacrosse ball first thing in the morning. This will awaken the incredibly sensitive nerve endings in your feet to start operating efficiently for a busy day. You can also use a variety of other balls, domes, rollers, and specialized devices to activate the nerve endings on the bottom of your feet and get some helpful massage and myofascial release on your feet. Some claim that nothing beats an old-fashioned wooden rolling pin for foot massage.

BIG TOE MOBILITY EXERCISES: The functional strength and mobility of your big toe is absolutely essential for correct walking and running technique, and to execute all manner of athlete and everyday movements efficiently and safely. The weight of your entire body moves over this single joint during every walking or running stride, making the big toe one of the most critical functionalities of all. When the big toe dorsiflexes before takeoff, it serves as the catalyst to harness rotational kinetic energy in all the toes, along with the arch, Achilles and calf muscles. The big toe is also the primary driver of glute activation, and the glutes (the largest and most powerful muscle group in the body) are essential for correct running technique. The dorsiflexion of the toe creates tension that travels through the foot, up the leg, and into glute muscles. This tension triggers the glutes to fire appropriately and contribute to forward propulsion. The big toe also provides a significant amount of balance and stability for walking, running, and especially side-to-side activity. Research validates our strong belief at Peluva that it's absolutely essential for the big toe to be allowed a separate range of motion from the other toes via the five-toe articulation shoe.



When the big toe is encased and compressed with the rest of your toes in a shoe, it becomes weak, rigid, and poorly functional over time. When the big toe is not functional, you generate a chain reaction of bad stuff, including an inappropriate dispersion of impact trauma into the lower extremities, and a loss of potential rotational kinetic energy at takeoff. In tandem with giving your big toe more freedom by going barefoot or wearing Peluvas, you can benefit greatly from performing some targeted big toe exercises.

Think of this exercise as a bicep curl for your toes!: Stand with your feet pelvis-width apart and pointing straight ahead with your weight in your heels. Try to lift the big toe only without moving any other part of your body. Resist the inclination to move your hips to help raise the toe. Don't get frustrated! Just intensify your focus on the correct execution of the exer-

cise, and keep at it consistently. Your big toe itself needs extra work, but you must also train your brain to efficiently fire the neurons that move the big toe. Make sure you lift your toe straight up instead of allowing it to move laterally. As you gain competency, you can try keeping the big toe still and lifting the other toes. Even more advanced is lifting one toe at a time—a fun long-term challenge!

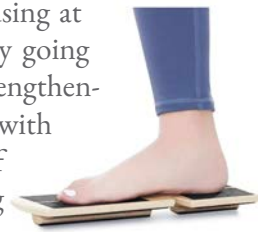
TOE SEPARATORS: These spreading devices are highly recommended to help you recover from years and decades of compressing the toes into restrictive shoes. These devices are made from durable silicon material and look like a rack with a slot for each individual toe and rubber spacing material between each toe slot. Sliding your toes into place provides a gentle spreading of the toes to re-educate them to position wider naturally. You can search Amazon.com for "toe separators" and find numerous affordable options for around 12 bucks, or you can spend significantly more for a top-rated product like Correct Toes ($65) or YogaToes GEMS ($36.) The quality products are much easier to put on and take off and worth the investment. Wear them in your home as much as possible—obviously you can't wear them with Peluvas or any other shoes. Try sleeping in them if it's no bother, as this can give you huge chunks of time for toe healing and improvement.



SLANT BOARD: A slant board allows you to spend significant time with your ankles in a dorsiflexed position and your Achilles tendon getting a good stretch. The slant board also provides an excellent prolonged stretch for the gastrocnemius and soleus calf muscles. Prolonged calf stretching can often relieve pain from plantar fasciitis, as tight calves put an extra burden on the plantar fascia. When you improve the range of motion of your calves, you lessen the strain on the arch that's causing chronic micro-trauma and often extreme discomfort. Regular use of the slant board can improve your range of motion for all manner of athletic activity, especially things like squatting, lunging, and deadlifting where joint mobility is critical for performance and stability.



Slant boards are great to pair with a standup desk, as you get additional variation options where you can stand on the board with either one or both legs. Most slant boards are adjustable, so you can pick a variety of angles for additional variation. StrongTek Professional Wooden Slant Board is a great choice on Amazon for $60.



FOOT MOBILITY BOARDS: These are great for using at a standup desk, or for getting some gentle mobility going first thing in the morning. This two-piece Ankle Strengthener unit puts your foot on a two-piece contraption with intentional instability as you work through ranges of motion in the foot. This delivers both strengthening and mobility benefits in the ankles, arches, and metatarsals, and also helps the calves and knees become more resilient.



WOBBLE/BALANCE BOARDS: Wobble boards are also a fun way to improve balance and activate the small stabilizer muscles in the feet and lower legs that are difficult to train with traditional strength workouts. You can intentionally rock the board back and forth and hold on for the ride, or try to "quiet" the board into a stable position.

Foot Exercises

Going barefoot and wearing minimalist shoes requires increased range of motion, muscular strength, and flexibility. Certain strengthening and stretching exercises are helpful to minimize the injury risk that comes from transitioning to a barefoot lifestyle, in particular the elongation of the Achilles tendon and the elimination of artificial support for your arches. Even though the Achilles tendon is the thickest and strongest tendon in the body, it can still become very fragile due to a lifetime of underuse and consequent atrophy. Similarly, our extensive reliance on arch-supporting shoes has made plantar fasciitis, a painful inflammation of the arch and heel area, one of the most common foot maladies. Plantar fasciitis is common among both the big shoe crowd and those attempting to integrate too quickly into a minimalist shoes and barefoot time with ill-prepared feet. The traditional plantar fasciitis treatment prescription of rest and more arch support (via bulkier shoes or custom-made orthotics) can often be unsuccessful. With

plantar fasciitis and many other overuse injuries, rest can cause further atrophy of the relevant tendons and muscles and does nothing to address the underlying cause of the injury.

Of course, every time you walk around barefoot or in Peluvas, you are getting a highly effective stretching and strengthening effect, with minimal injury risk. Hence, you should consider these exercises supplemental to your primary objective of gradually increasing the amount of time you spend barefoot or in Peluvas each day. These exercises can be conducted any time, following a brief warmup period of gentle movement to get blood flowing in your lower extremities. This list is intended as a simplified, all-purpose program to lengthen certain muscles and joints affected by a barefoot transition, and to increase general flexibility and strength in your lower extremities. If you have specific injuries or medical conditions, please seek professional support to obtain a customized strengthening and stretching program. Just five to 10 minutes of devoted effort to these exercises each day can deliver excellent results.

Start with a reasonable plan to do something every day to improve your feet—even if only for a few minutes. Obviously, if you are experiencing weakness, discomfort, or pain related to your transition out of big shoes and into Peluvas and barefoot time, you may want to devote more effort to these exercises. Remember to never introduce additional pain to sensitive areas. This means taking time off until soreness is subsided, then resuming your foot exercises and use of Peluvas for ambitious activities.

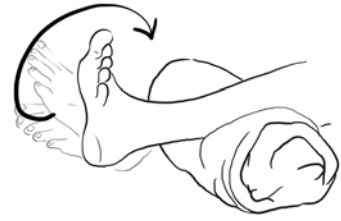
The foot exercises are great to learn and then sprinkle into your daily routine any time you have a few moments to spare. You can do some sets while working at your desk, and especially when you are enjoying evening screen leisure time. You can also have fun throwing in some challenges like walking on your toes across your home or out to the mailbox. If you have a staircase or even a single step, take a deliberate step where you push up onto your toes and hold the position for five seconds. Or, plant your midfoot on the edge of the stair and lower your heel below the stairline and hold that position for five seconds. It's also a great idea to do a few foot exercises after a significant activity outing with bare feet or Peluvas.

Strengthening Exercises

FOOT POINTERS: While sitting or lying down, flex your foot towards your shin and hold that position for 10-15 seconds. This is the dorsiflexed position. Next, do the opposite move by pointing your toes as far forward as you can and holding for 10-15 seconds. This is the plantar flexed position. Holding the dorsiflex position (foot pointing skyward) is a fantastic strengthening exercise for the tibialis anterior muscle that runs along the front of your leg. This muscle is extremely important for impact absorption, but is a common area of weakness. It doesn't get as much direct activation as do the calf muscles, so it's easy to develop a functional strength imbalance between the back and the front of the leg.

Ben Patrick, popular Internet strength and mobility coach known as "Knees Over Toes Guy," recommends progression exercises that emphasize the development of the anterior tib in order to alleviate knee problems. A weak anterior tib can result in excess impact trauma dispersed throughout the lower extremities. This puts the knee in a particularly vulnerable position when running or jumping. Patrick has a tiered exercise protocol where you can start with simple anterior tib isometric positions and work toward eventually using a specially designed "tib bar," where you slide feet into position and add weight plates for resistance as you work your feet through the dorsiflex-to-plantar flex range of motion.

FOOT CIRCLES: While sitting or lying down, flex your foot towards your shin and hold that position for 10-15 seconds. Next, do the opposite move by pointing your toes as far forward as you can and holding for 10-15 seconds. After holding each position, roll your foot in a clockwise circle very slowly 10 times, followed by 10 deliberate counter-clockwise circles. The original dorsiflex and pointing positions should represent the outer edges of the circles you complete. This exercise helps to improve strength and mobility for the Achilles tendon, ankle, and the tibialis anterior muscle along the front of your leg.



TOE WALKING: Rise up on your toes and walk around for five minutes without letting your heels touch the ground. If you have access to a treadmill, try walking or running up a slight incline on your toes for five minutes, wearing stocking feet for safety and hygiene. If five minutes is too difficult, strive for an intermediate goal first and then work up to and beyond five minutes if possible. You can also do simple toe raises standing in place; two sets of 20 raises is a good starting point.



TOWEL CURLS: Spread a towel out flat at your feet. Grip the edge of the towel with your toes and curl the towel toward you. Repeat until you have bunched the entire towel up and behind your feet. Shove the towel straight behind you, and also to either side of your foot as it starts to bunch up. Make an effort to spread your toes as wide as possible in the air before lowering them onto the towel and curling them. For variation, you can place a group of small objects, such as marbles, on the floor, pick them up with your feet, and put them into a different pile.



ARCH ENGAGERS: Roll two hand towels to make small tubes and place them on the ground. In your bare feet, land your heel on one towel pad and land your midfoot on the other towel pad. Then, bend forward at the knee, with the knee tracking on the same line as the foot—perhaps slightly inside the foot line. With your heel and midfoot elevated, you will notice more intensely how your arch stretches and flattens as you bend your knee forward. This is a good way to strengthen the arch, and simulates what happens during the walking and running stride to generate rotational kinetic energy. Do a set of 10 with each foot.



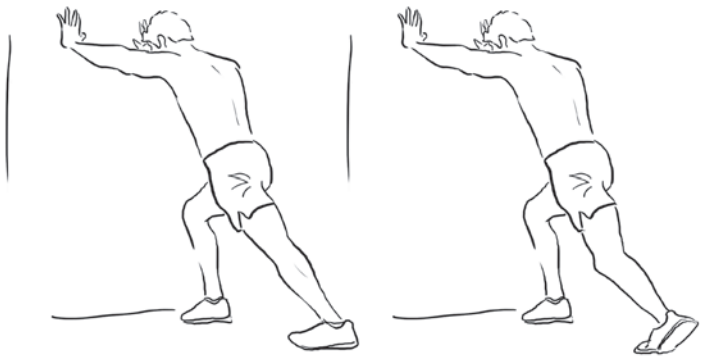
CALF RAISES: The two major calf muscles (gastroc and soleus) must be both strong and flexible to promote optimal foot health. If your calves are

weak and/or tight, you will overburden the feet with impact load and increase micro-trauma and inflammation in the feet, calves, and even higher into the thigh and lower back. As you may have already figured out, the calves are a very sensitive muscle group that are easily strained by everyday activity and fitness endeavors. Tight calves are a common condition, as it's driven strongly by wearing elevated, cushioned shoes your entire life. Perform two sets of 12 on each foot.



Stretching Exercises

CALF STRETCHES: Stretching the two calf muscles (gastrocnemius and soleus) in the back of your lower leg is key to improved ankle and arch flexibility, and is lauded as an effective cure for plantar fasciitis. Stand in front of a wall or other support structure and touch the wall with outstretched



arms, keeping one leg in front of the other. Keep your rear knee straight and your heel completely on the floor. As you maintain your rear heel's connection to the floor, thrust your hips forward and push into the wall. This will activate a gastrocnemius stretch (gastrocnemius muscles are the visible rounded muscles just below your knee). Use your hip thrust to govern the intensity of the stretch. Hold for 30 seconds, or up to two minutes if you are experiencing stiffness or pain in your arches or calves.

Next, allow your rear knee to bend and your heel to rise up off the ground. This will transfer the stretch to the soleus, which are the long, skinny muscles

extending from the Achilles tendon up either side of the leg and into the gastrocnemius muscles. Hold for 30 seconds to two minutes. Then, repeat the stretches with the opposite leg extended behind you.

GROK SQUAT: My all-time favorite, full-on primal indigenous people's stretch is a safe, comprehensive total body stretch that is particularly valuable for your barefoot transition. Holding the squat position provides a steady, gentle stretch for arches, ankles, and calf muscles.



Place your feet at shoulder width, bend your knees, extend your arms out, and lower your torso down (going in-between your bent knees) until your butt is almost touching the ground. Strive to keep a nearly straight back as you lower into position. You can obtain a deeper stretch by extending your arms out farther in front of you. Gently rocking onto your forefoot will focus more stretch on your rear lower legs. Hold the squat for 30 seconds to two minutes. Ease up and out of the stretch with the load on your quads, taking care to preserve a straight back angle.

HAMSTRING STRETCH: There are endless variations of hamstring stretches conducted while standing, sitting, or lying down. The following hip-hinging exercise is not only an excellent and very safe hamstring stretch, but it also promotes correct posture and movement mechanics for bending over.



Stand up straight with your palms resting on your thighs. Bend forward at the waist, taking great care to keep your back straight. Try to extend your butt out away from your body and your head forward; don't allow your back to curve at all. When you start to feel a gentle stretch in your hamstrings, press your palms into your thighs to regulate the stretch and preserve a straight back. Hold for 30 seconds to 2 minutes.

TOE STRETCH: Seated on a chair or the ground with knees bent, reach down and grab your toes with your palm, letting your fingers drape over the back side of your foot. With your other hand, grab your heel and hold your foot steady. Pull back on your toes to feel a comprehensive stretch along your arch, Achilles tendon, and up into your calf. Hold for 30 seconds to 2 minutes on each foot.

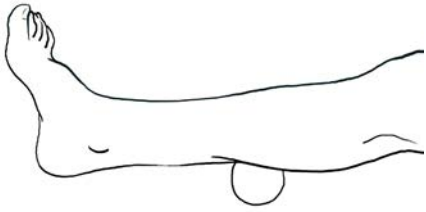


ARCH MASSAGE: Roll an object, such as a lacrosse ball, golf ball, specially designed roller, or frozen plastic water bottle, back and forth along your arch line. This exercise is quite useful for plantar fasciitis pain. Flex your foot and move your toes around as you roll over tight spots, and try to put your foot through a broad range of motion. Roll for two minutes and up to 10 minutes if you are experiencing trouble in your arches.





CALF MASSAGE: Sit on the ground with your legs outstretched and a ball or other roller object underneath one of your calves. When you hit a tight spot, flex and extend your ankle until it starts to feel less tight. Be sure to hit every aspect of your calf. Roll each calf for two minutes and up to 10 minutes if you are experiencing pain or tightness.



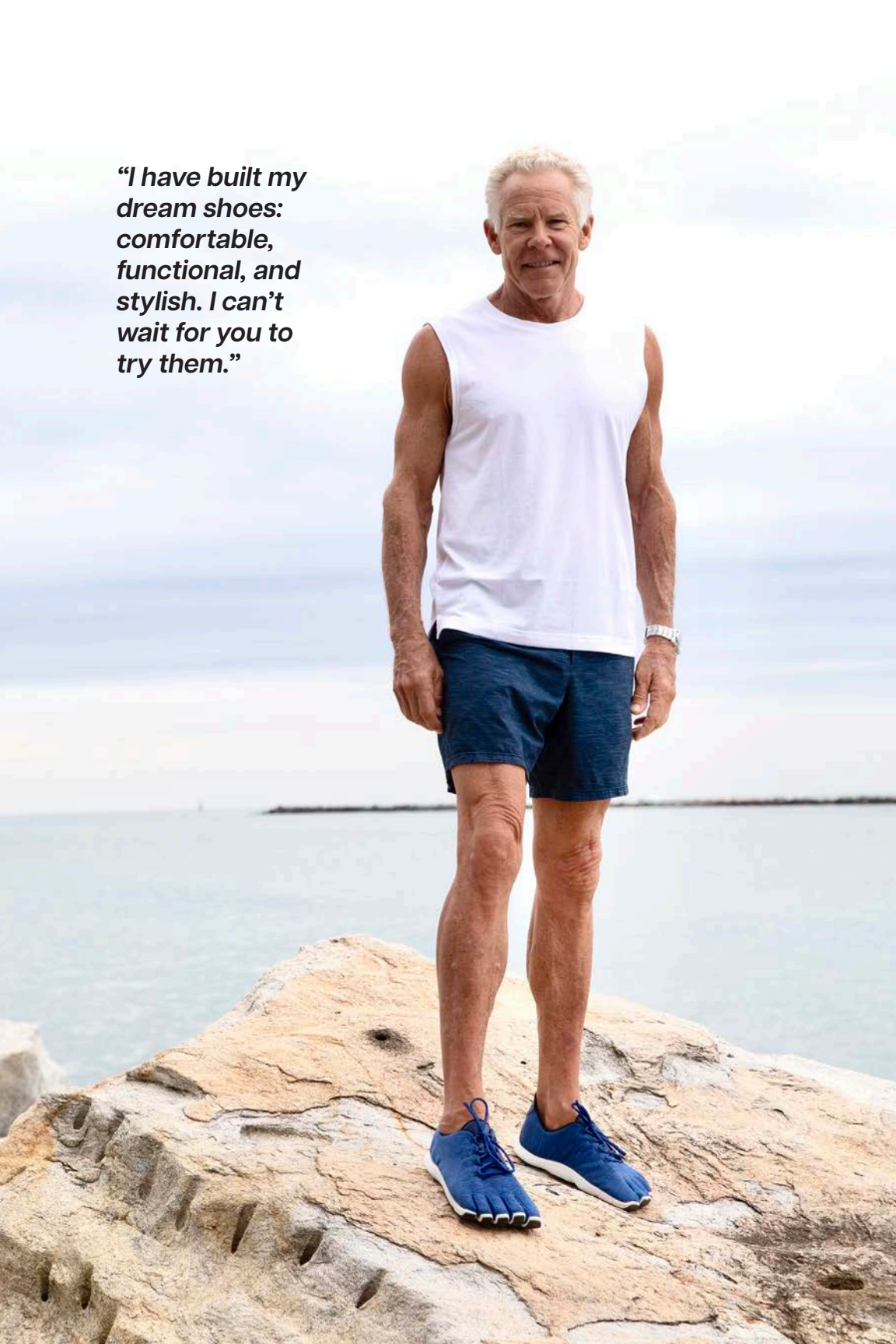
A Message From Peluva Co-Founder Mark Sisson

I've been obsessed with minimalist footwear for decades, dating back to my days as a hard-training elite marathon racer who struggled virtually non-stop with overuse injuries. I kept thinking there had to be a better way than to lace up my ever-more high-tech shoes and cross my fingers hoping that nothing would start hurting again. No such luck. I knew instinctively that something was wrong with the running shoe industry, and research confirms the astonishing fact that the rate of running injuries has only increased since the start of the running boom in the 1970s and the relatively primitive shoes available at the time. My apologies to Nike and the other major brands that have helped promote a healthy, fit, active lifestyle in recent decades, but the cushy shoes that drove the growth of the running shoe industry have caused lots of trouble for the human foot. They also have created an undesirable catch-22: your feet are f*cked so you need giant pillow shoes in order to run without getting hurt over the short term, and you are virtually assured of eventually getting an overuse injury due to the compromised form and increased impact trauma prompted by the pillow shoes.

I was overjoyed to see the rise of minimalist shoes as a major part of the ancestral health movement. Finally, a potential solution appeared! Alas, we collectively went for the instant gratification of barefoot living without demonstrating the patience and restraint necessary to transition from decades in restrictive shoes. I've been a huge enthusiast of minimalist shoes for nearly 20 years, including wearing out dozens of pairs of the early five-toe shoes. My feet have adapted wonderfully and I sang the praises everywhere I went, but I didn't see too many people who shared my infatuation.

That's when the wheels started turning in my head: What if I could create a shoe that was more functional, comfortable, safe, and stylish than the "all or nothing" options that the marketplace had to offer? I started making prototypes, cutting, slashing, stitching and gluing commercial footwear in my modest workshop, and then hiring designers to create new prototypes from scratch. As my experiment became increasingly consuming, I soon became my own most discerning and critical customer. These shoes had to be comfortable not just for a few minutes or hours, but for longer periods of standing, walking, and sitting throughout the day. That meant literally building a shoe from the ground up, rejecting virtually every fundamental

“I have built my dream shoes: comfortable, functional, and stylish. I can’t wait for you to try them.”



of modern active lifestyle footwear. I noticed that even the most comfortable cushioned shoes would feel great for a nice trail hike or neighborhood jog. But, with repeated use, it was inevitable that shoe users developed little niggles in the feet, knees or lower back. We now know that these micro-traumas are strongly driven by shoes with elevated heels, rigid soles, and excessive cushioning because they deliver an increased and inappropriate impact load.

My son and Peluva co-founder Kyle came up with the term "sustainable comfort." This means wearing a shoe that's comfortable when worn for long periods of time, not just the first few minutes of trying it in the shoe store or the first few workouts. Next, our shoes had to be truly functional. To us this meant one major distinctive, and mandatory, innovation: We had to have individual articulation of the toes to allow for a complete dynamic range of motion and the closest possible barefoot simulation. There are so many great shoes in the minimalist category that have zero drop and a wide toe box, but the articulated toes puts Peluvas in a different category. Of course, we spec'd out zero drop and zero arch support, and we also wanted shoes that were thin enough to allow for the foot to flex significantly and allow you to feel and adjust to changes in terrain underfoot. On the other hand, they also had to have enough shock absorption so that one could walk for longer distances on very hard surfaces and not experience pressure under the metatarsal area that sometimes can feel like a bone bruise when you are on concrete or hard indoor surfaces for a long time.

Equally as important as functionality, our new shoes had to have style. Most of the other attempts at five-toed shoes have been, shall we say, less than attractive—like trying to put ballet slippers on 200-pound UFC fighters. And many of the regular, wider toe box minimalist shoes, while often fairly good-looking and stylish, do not allow for individual toe splay. To be clear, I was always against the idea of using Peluva shoes for "performance." In fact, almost to the contrary, I wanted shoes that people could wear all day long, with less emphasis on whether they might use them (or eventually use them) for things like running or complex sporting activities.

The everyday use goal is really about the toes being comfortable and allowing the small muscles of the feet to work easily through the correct ranges of motion when walking, standing, climbing stairs, working out in the gym, driving a car—most of the things you normally do in a day. Then, my vision

was that when it was time to perform, fitness enthusiasts would be better adapted to don their specialized shoes. My friend Jim Van Dine coined the phrase "pre-covery" for this. It means that with Peluvas you will slowly, gradually, easily, and comfortably spread the toes out a little and build up the strength in the smaller muscles of your feet that may have been neglected for years or decades in your regular shoes. Then, the idea is that your feet will be that much more adapted for specialized activities in the appropriate shoes.

To complete the dream, I wanted a system of footwear that would accommodate any occasion in life—from just walking around in your house, to going to work, to driving your car, to standing around in an office or clerical setting. In fact, once you try these out and get a sense of what toe freedom really feels like, we think you won't want to wear regular shoes ever again. The end result is Peluva—a shoe that I believe might just change the way the world walks. I hope you agree. I sincerely appreciate your interest and giving something new a try!

Resources And Suggested Reading

- Major Dr. Daniel Lieberman study about barefoot running
- Impact trauma with stride
- Meta study of running injury rate
- NY Times - Humans born to run
- Dr. Liberman study “footstrike patterns and collision forces in habitually barefoot versus shod runners
- Glute activation and big toe relationship
- Windlass mechanism in the foot
- Importance of big toe in running and walking gait
- How the big toe influences your stability and movement
- Best shoes for wide feet
- Lax ball for foot massage
- Walking vs running study
- Why we land in front of COG, Steve Magness
- The problem with duck feet
- Videos for foot health
- How anatomical structure affects running mechanics
- Usain Bolt slow motion camera
- Deadlifting barefoot
- Hip muscle group overview
- Katy Bowman - How flip flops change your feet
- Running biomechanics
- Problems with toe spring
- Harvard & Dr. Lieberman toe spring study
- Supershoe performance improvement by Amby Burfoot
- Supershoe controversy by Alex Hutchinson
- 16 x 800 in 2:24-2:28 by Mark Sisson



The Barefoot Advantage

peluva

Relax. Realign. Strengthen.



Zen Active Slip-On
BLACK / WHITE



Strand Lightweight Trainer
NAVY / WHITE



Carrie ST
SKY BLUE / WHITE



Strand Lightweight Trainer
SKY BLUE / WHITE



Miami Slip-On
BLACK/WHITE



Strand Lightweight Trainer
URBAN CAMO / WHITE

Once you experience true **toe freedom** with peluva®, you won't want to wear anything else. Luckily there's a peluva® for every occasion.

Access 10% discount on your first pair.

peluva.com wearpeluva wearpeluva

Founder Story

After two years of prototyping, we've built our dream shoe. We're proud to introduce the first minimalist shoe that delivers all three crucial criteria: comfort, function, and style. Let feet be feet, so you can be the best you.



Mark & Kyle Sisson
FATHER-SON CO-FOUNDERS

> peluva® has created the perfect shoe for optimizing foot comfort and strength.

Andy Bryant PODIATRIST



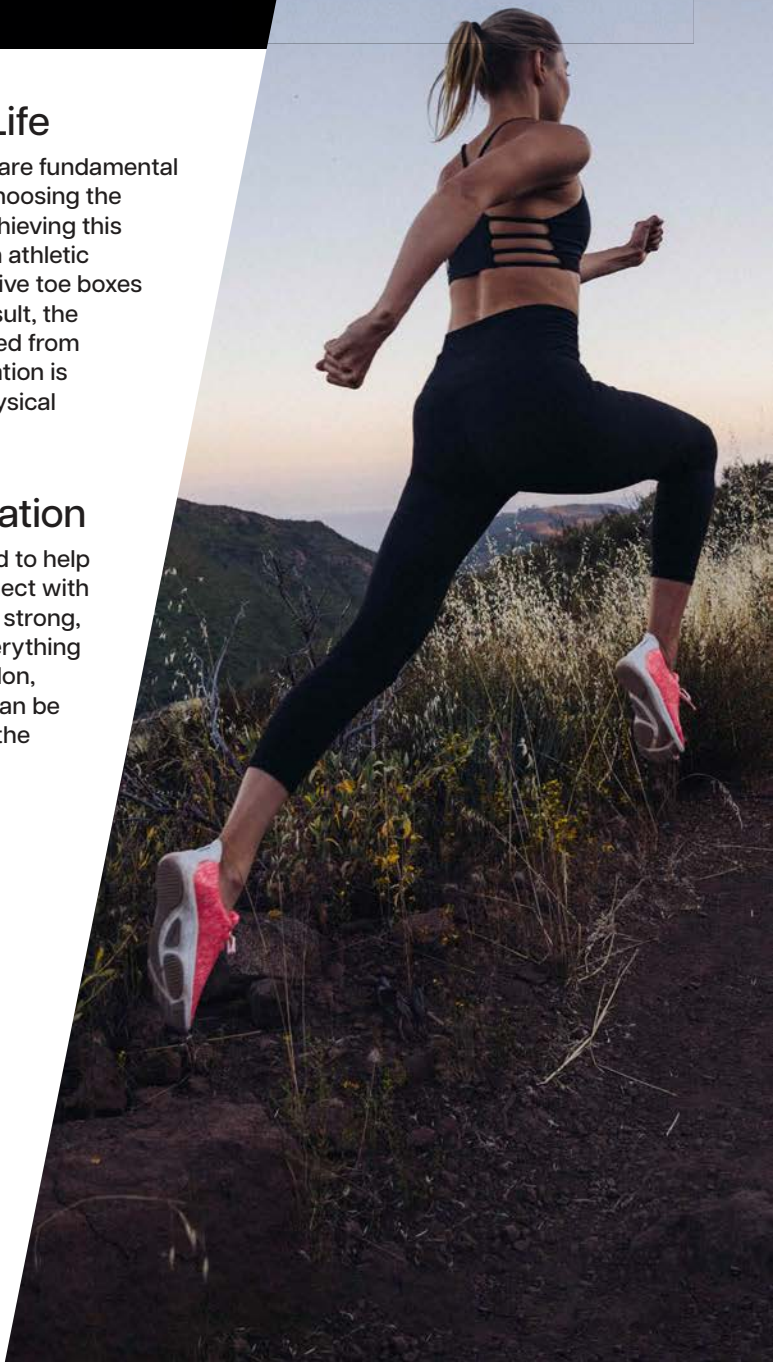
Performance for Life

Strong, flexible, resilient feet are fundamental to good overall health, and choosing the proper footwear is vital to achieving this goal. Ironically, most modern athletic footwear have overly restrictive toe boxes and zero groundfeel. As a result, the patient/client is disadvantaged from the outset. A superior foundation is needed for truly effective physical therapy work.

A Stronger Foundation

Peluva® footwear was created to help you and your patients reconnect with the ground. If your feet aren't strong, flexible and resilient, then everything else (every joint, muscle, tendon, ligament, fascia, and nerve) can be compromised all the way up the kinetic chain.

- Effective zero-drop
- Air-light flex
- Optimal ground-feel
- Sustainable comfort
- Five-toe glove fit
- Elevated style



The feeling of going barefoot, with the practicality of a shoe.



Toe Articulation

Your toes need the ability to move up and down independently. In particular, the “great” (or big) toe needs to be able to abduct and push off in response to changes in surface texture.

Groundfeel

Groundfeel informs the brain on how to distribute g-forces by contracting the arch, flexing the toes, twisting the ankle, bending the knee and torquing the hip.



Toe Splay

Your toes need the room to splay outwardly to fully optimize the strength and utility of each joint, muscle, tendon and ligament in your feet.



Normal feet in peluva® Strands.

Without these three key attributes, feet can’t possibly move the way they were designed. Only peluva® can offer these three essential elements in a comfortable, stylish shoe.





