Keys to Efficient & Pain-Free Running

Selecting Shoes & Preparing to Run

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Table of Contents:

Getting to Your Happy Pace

Have you been injured and are looking to return to running? Have you hit a plateau that you just can't move past? If so, you are like many of the runners we see in the clinic. Running is an effective and easily accessible form of aerobic exercise. There's no specialized machines or equipment required and it's something you naturally learned how to do when you were a kid.

Whether you have goals to return to casual running or you're signed up for a marathon, your progression past an injury or a plateau can be intimidating. A safe and efficient running progression requires planning and preparation. Because of the repetitive nature of running mechanics, it's possible for previous injuries to crop back up as you increase your mileage. You can avoid this by implementing some key strategies. This is the first of several e-books that will outline different aspects of running.

The most common questions we hear in the clinic are "How often am I allowed to run with this pain?", "What type of shoes should I wear?", and "When is it safe to start running while recovering from an injury?" These are all great questions and can be answered with another great question: "What should I be doing before and after my run?"

The responses should be individualized based on your body, your running experience, and your injury history. With the right planning and progression, your running goals can be easily reached.

Getting to the Root of the Problem

In the clinic, there are a several commonalities runners exhibit when they have pain or have hit a plateau. Addressing these patterns will allow your body to quickly progress in a pain free way.

Core Weakness

Your core consists of muscles on the top, bottom, and sides of your torso. If your core is weak, it decreases the efficiency of your leg muscles. Forces can then be passed inefficiently through your body and cause pain or fatigue as you attempt to maintain your usual mileage. Your physical therapist will be able to identify specifically which of your core muscles need strengthening and retraining.

Hip Weakness & Stiffness

Your gluteal muscles control hip extension (moving your leg backward) and hip abduction (moving your leg out to the side). These hip muscles are critical for creating the movements of your legs as well as balancing on one foot. If your hip abductor muscles are weak, your knee can cave inwards, resulting in increased stress at your knee, ankle, and foot. This is a good example of how a problem at one joint can cause pain at a joint further away.

You should be able to balance on one leg with your hips level for 1 minute.

If the muscles around your hips are stiff, you might struggle to achieve full range of motion. This decreased movement can mean increased tension at your knees and back, leading to pain or fatigue. People most commonly experience stiffness in their hip flexor and hamstring muscles. Stretching these muscles dynamically can help.

Leg Muscle Imbalance

A very common muscle imbalance runners have is strong quadriceps muscles with weak hamstring and glute muscles. This is one of the leading risk factors for ACL injury in female athletes. Without sufficient hamstring activation, you lose the natural protective mechanism they provide to your ACL. Being "quad dominant" exerts an abnormal amount of force on your knee cap and can cause stress and pain at the knee. A leg muscle imbalance may also alter your pelvic position and lead to back pain. Ideally, your hamstring and glute muscles should be engaging appropriately during your gait cycle to propel you forward instead of only using your quads to pull yourself forward.

Foot Weakness & Stiffness

If your feet feel weak or stiff, gravitational and impact forces are not well absorbed or passed efficiently through your body. This could result in foot pain that might travel up your leg to your knee, hip, and even your back.

The job of a physical therapist is to identify which dysfunctional patterns are present and select appropriate intervention techniques to address them. The severity and the contribution of each of these patterns to your running technique will vary widely person to person. To prevent an injury from occurring or returning, the patterns present in your running technique need to be assessed individually to determine what the priority is for you.

Prepping for Your Run

"Should I stretch?"

One of the most common questions runners ask us is whether or not they should stretch before running. The answer is NO!

Typical static stretching like touching your toes or pressing your heel to your bottom have been shown to be detrimental to muscle performance. This type of stretching will impact how fast and far you can run and does not do a good job of preparing your body for physical activity.

Previously, it was believed that improving flexibility through stretching would allow you to exercise more safely and efficiently. Because of this, most people were taught in gym class and sports programs that stretching is an essential step before exercising. However, recent research has re-evaluated this belief and shown that static stretching can be detrimental.

Stretching can provide improvements in flexibility, however it reduces muscles performance as summarized below:

- Muscle power: DECREASED[1,2,3]
- Rate to generate power: SLOWER[1,2,3]
- Ability to generate power: DECREASED[4]
- Maximum strength: DECREASED[5,6,7]
- Repetition capacity: DECREASED[8]
- Vertical jump height: DECREASED[9,10]

The evidence is clear! By performing static stretching before running, you are limiting your muscles' ability to do their job and negatively impacting your workout, run times, and athletic performance. There's now a better way to prep your body to get your muscles performing at their peak potential.

"What should I do before I run?"

Research suggests that the best way to maximize your muscular capacity, optimize your athletic performance, and minimize your risk of injury is by performing a dynamic warm-up.

These types of warm-ups have been shown to improve jump height and force as well as improve sprint times[12,13]. Dynamic warm-ups are far superior for prepping your body for activity as they help to remind your body which muscles should be activating while you're running while also increasing range of motion and raising your heart rate.

If you're recovering from an injury, it is especially important to provide your body with the best preparation. That's why we've developed a dynamic warm-up to specifically help you prepare your body to run. The warm-up is outlined on the next page and each movement should be performed with 5-10 reps on each side or by moving between two light posts.

After completing this series of exercises, you should begin running slowly and accelerate to your target pace over the course of 10-15 minutes. This slow progression will allow your body to adapt to the demands you are placing on it and help to reduce the risk of injury.

Whether you're about to do high intensity interval training or a light jog, the way you warm up DOES matter. Prior to running, prioritize active dynamic movements that mimic the mechanics of running and your body will thank you. Switch up your warm-up and see the difference!

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The Body Gears Dynamic Warm-Up

(5-10 steps each side)

Hamstring Sweeps: Step your heel forward while keeping your toes up. Sweep your hands down towards your toes. You should feel a stretch down the back of your leg with each step.

Piriformis Pulls: Step forward and pull your other foot towards your opposite hip, allowing the top of your thigh to roll out to the side. You should feel a stretch in your hip with each step.

Quad Stretch with Reaching Overhead: Step forward and pull one foot towards your buttocks while reaching your opposite hand up in the air. You should feel a stretch along the front of your thigh and your opposite waist.

Alternating Sumo Squat: Squat with your feet wider than your hips and your toes pointed out slightly. Pivot 180 degrees and squat again facing the other direction. Continue pivoting as you advance.

Side Lunge: Facing sideways, step one leg out to the side. Lunge on your leading leg keeping your back leg straight. You should feel a stretch in the middle of your back thigh. Remember to return facing the opposite direction.

Karaoke: Shuffle sideways alternating stepping in front of and behind the other leg. You should feel an alternating rotation at your hips and spine. Remember to return facing the same direction to do the other side.

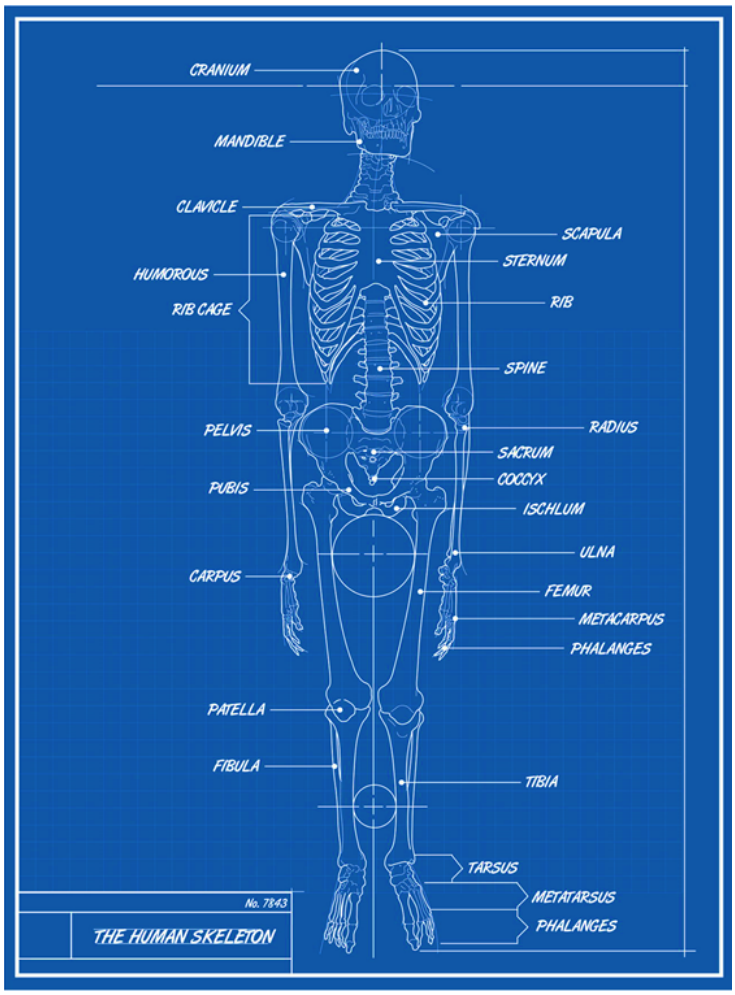
Open the Gate/Close the Gate: Step forward bringing one knee up towards your chest, then move your knee out to the side and back down to the ground to "open the gate." You can do a quick jog between alternating your legs. Return to your starting line with the same actions in reverse to "close the gate." Imagine mounting a bicycle, getting your foot up high enough so you don't knock it over.

Prepping for Your Run

"What is a GIG?"

In addition to your dynamic warm-up, consult with someone who knows how to customize a GIG specific to your physical blueprint. GIG stands for "Get in Gear" and is analogous to turning a dimmer switch all the way up so that once the electricity reaches the light bulb, the bulb shines brightly. Doing just a warm-up routine is like leaving the light dim. The light is still shining, but it has significantly more potential for brightness.

For example, the Side Lunge from the Body Gears Dynamic Warm-Up will be more effective if you "get in gear" first by mobilizing your innominate into abduction first. Don't know what an innominate is? Ask us!



Shoes

Selecting the right footwear is a key component of healthy running. Running shoes serve as the interface between your body and the ground and can have a significant impact on the efficiency of your stride and how your body responds to the forces moving through it. A poorly fitting shoe can mean increased stress on your feet, knees, hips, and even back, leading to a recurrence of your symptoms or even a new injury.

If selecting the right shoes seems overwhelming, that's because it is. There are so many designs to chose from and your foot type, body type, running style, and many other factors all impact which styles will work best for you.

It's also important to remember that shoes have a lifespan. As you increase your mileage, the structural components that are meant to support and cushion your feet degrade. This means that even a perfectly fitting shoe will eventually no longer provide a safe and efficient platform on which to run.

Whether you're returning to running after an injury or it's time to retire your current pair of shoes, creating the most ideal environment for your feet as possible is key to a good run.

"When should I replace my shoes?"

There are many, many different ways of determining when a shoe needs to be replaced. Some experts recommend replacing your shoes after a certain number of miles (anywhere from 300-600), but this can be difficult to track for casual runners and can vary based on your weight, stride pattern, and the surface you run on.

Another option is to monitor the wear patterns on your shoes. If you don't track your mileage, look for these signs that your shoes may have worn out:

1. Thinning and holes in the upper material
2. Treads flattened and showing deeper layers
3. Creases in the midsole
4. Sole flimsy and flexible or with buckling points

Our last piece of advice is to listen to your body. If you're noticing that you're getting more soreness or experiencing little aches and pains without any major increase in mileage, it's probably time for some new shoes.

"How do I find the right shoes?"

To find out your foot type, check the wear patterns on your old shoes. Once you know your foot type, find the a shoe that will support you where you need it most.

Overpronator/ Low Arch	Neutral	Underpronator/ Supinator/High Arch
The sole of your shoe will be worn down along the inside of the forefoot and heel.	The sole of your shoe will be worn down across the middle of the forefoot and slightly along the outside of the heel.	The sole of your shoe will be worn down on the outside edge from the forefoot to the heel.
You likely require more rigid and supportive shoes, especially around your arch, for motion control and stability.	You likely only need a general stability shoe without any corrective bells and whistles.	Because high arches reduce natural shock absorption, you likely need a shoe with more cushioning.

Next, consider your body type. Larger/heavier runners will require more cushioning to dissipate the force of body weight and gravity into the ground. A minimalist shoe may not provide sufficient padding to allow for the safe transfer of forces and a well-cushioned shoe may be more appropriate.

In terms of running style, the most straightforward aspect to consider is foot strike. The majority of running shoes are designed in a way that encourages heel strike. If you are a heel striker, shoes with larger heel pads will soften the impact. If you strike the ground with your mid-foot, then your shoes will require less padding as your body is more naturally able to absorb forces through your foot, calf, and thigh muscles. Always consult with a physical therapist or experienced running coach before changing your strike pattern.

"What types of shoes are there?"

Motion Control Shoes: These are the most supportive types of shoes and are appropriate for runners with very mobile feet, low arches, or flat feet. They usually have a medial post (a solid support along the inner side) to help prevent flattening of your foot, allowing the rest of your leg to stay in optimal alignment. These are the most rigid and supportive types of shoes and their solid base makes them good for overpronators or people with flat feet. Notable models include the Asics Gel Foundation, Brooks Addiction, and New Balance 1540 v2.

Cushioned Shoes: Sometimes referred to as maximalist shoes, these shoes are designed with thick midsoles and cushioning around the entire foot. These are the most cushioning and shock absorbing types of shoes. They're good for people with high arches or rigid feet that don't dissipate forces well. Notable models include the Hoka One One Bondi 5, Altra Olympus 2.5, and Brooks Glycerine.

Neutral Stability Shoes: These types of shoes are designed for the average runner and typically combine components of motion control and cushioned shoes with a moderate amount of arch support. These shoes are good for people with normal arches and notable models include the Asics GT2000-5, Brooks Adrenaline, and Mizuno Wave Inspire 13.

Minimalist Shoes: These shoes have become popular in recent years and hyped as the most 'natural' way to run. While this may be true, these shoes are only appropriate for experienced runners. Because they provide almost no support, the muscles in your feet and lower legs have to do an increased amount of work that they're not used to doing if you've run in traditional western shoes your whole life. There should always be a transition period for acclimatizing to this type of shoe and it can take up to a year to transition safely without injury. If you are interested in transitioning to a minimalist shoe, ask your physical therapist for specific strengthening exercises that follow mobilization techniques to increase the pliability of your foot.

Shoe Features to Consider

- Heel-Toe Drop/Offset - the height difference between the heel and toe beds. Typically, minimalist shoes have a smaller offset, while more cushioned or supportive shoes have a larger offset. A large component of transitioning to minimalist shoes is gradually decreasing your offset.
- Heel Counter - a solid plastic component that supports the backside of your heel to prevent rolling. It also helps to anchor the shoe to your foot, meaning a shoe does not fit you properly if your heel is lifting out.
- Medial Post Torsion Bar - denser material in the middle part of the shoe that supports your arch
- Toe Box - the front part of the shoe where your toes are. If you take your insole out of your shoe and step over it, your foot should not expand past the width of the insole. If it does, a wider toe box will allow for your foot to expand while running, making for a better force generating lever.

"Do I need to break in my shoes?"

YES. Once you've found your perfect shoes, it is critical that you transition into wearing them gradually (especially if they're significantly different from your previous shoes). If you transition too quickly, you will not give your feet and the rest of your body enough time to adapt and this can lead to pain and injury. Experienced runners often buy a new pair of shoes before their current pair is totally worn out to account for this transition period.

To break in your new shoes, begin by wearing them for a week around the house and while out walking. This will allow the insole, midsole, and upper material to begin to mold to your foot while not placing too much stress on your body. If your new shoes are very similar to your old shoes, begin the following week by alternating them for every other run. If your new shoes are significantly different from your old shoes, begin 1 run a week in the new shoes and continue to add an extra run every week until you've phased out the old shoes. Take it slow and allow your feet to adapt to their new home.

Achieving Pain Free & Efficient Running with Physical Therapy

Whether you need help with an injury, a running plateau, or selecting/ transitioning your running shoes, physical therapy is effective when it addresses the 3 pillars of human movement. These are Mechanical Freedom, Neuromuscular Integration, and Motor Control. No other type of health care practitioner addresses all three of these components and nor do all physical therapists.

To achieve pain free and efficient running, ensure your physical therapist will be addressing all three of these components. At Body Gears, we start by assessing the mobility and strength of your feet, knees, and hips, as well as your running technique. Not only will this help you determine the best shoes for you, but your physical therapist can help you fine-tune your warm-up with movements specifically targeting any inefficiencies in your running technique.

Once we've got your joints moving and your muscles firing through their full range of motion, we'll help you to optimize your running technique. Efficient movement comes from coordinating the right muscles to fire at the right time and the right amount with a balance between muscles meant to stabilize and muscles meant to create motion.

To hear more about the Body Gears method, have your lingering questions answered, or speak to one of our physical therapists about reaching your running goals, schedule a Free Discovery Session!

BodyGears® Physical Therapy

About Body Gears Physical Therapy

Body Gears exists to enhance human mechanics, movement and performance, promoting a healthier quality of life and elevating you to your optimum self. It's our vision to help you discover a better life by redefining Physical Therapy.

At Body Gears, you will find some of the country's top Functional Manual Therapists who love problem-solving challenging cases. We achieve excellent results through study and collaboration.

Call to Schedule Your Free Discovery Session Today

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