



**A**s you run the greatest impact is experienced just after the foot first contacts the ground at the front of the stride. The degree of impact depends on:

- *How far your foot contacts the ground in front of your hips*
- *The amount of tension held in the leg and foot*

The further your foot contacts the ground in front of your hips, the further you place your leg in front of your body weight and the greater the time spent running into the leg rather than over it. The more you run into your leg the greater the impact, especially if the leg and its foot are tensed.

Running into the leg also wastes energy since it causes a loss of forward momentum as if you are momentarily putting on the brakes.

For an average runner this impact and momentary loss of forward momentum occurs approximately 10,000 times per hour causing potential for injury and unnecessary muscle fatigue.



The most extreme case of impact and loss of forward momentum involves a forward reaching foot landing on the heel with an almost completely straight and tensed leg. This is referred to as “heel striking”. Heel striking can be particularly harmful as it introduces bone in the absorption of impact which can lead to stress fractures.

Many runners run this way because they believe they need to reach forward with their feet. They think the further they reach, the greater the stride length and the faster they go. The safer more efficient method is to reach less in front of the hips and allow the stride length to increase more behind your hips.

To reduce impact and wasted energy the goal is to run with your lead foot contacting the ground just in front of your hips without unnecessary tension in the lead leg and foot. The manner in which you achieve this is by running with:

- *Aligning your posture and leaning forward slightly*
- *Avoiding use of quadriceps and hip flexors to reach the leg and foot forward (in front of the hips)*
- *Minimizing forward swing of the hand*

Aligning your posture and leaning forward slightly

A tall aligned posture with slight forward lean helps keep your hips forward and closer to where your feet contact the ground.

If you're bent at the waist or hips, your foot contacts the ground out far in front of your hips. An aligned posture with slight forward lean however, decreases this distance between your hips and the foot.



To obtain a tall posture without tension, imagine something is attached to the top of your head pulling you upward. Ensure everything from the neck down is as relaxed as possible including your knees.

A slight forward lean helps keep your hips forward. Once you are in your tall posture, concentrate on moving your belly button forward slightly just over the balls of your feet.

Concentrating on keeping your belly button forward helps ensure you don't bend at the waist or hips, which actually moves the belly button rearward.



### Avoiding use of quadriceps and hip flexors to reach the leg and

You want to eliminate the primary muscle activity required to reach the leg and foot forward in front of your hips. This includes the quadriceps muscles that extend the knee and position your foot forward. This also includes the hip flexor muscles that move the whole leg forward in front of the hips.

Here's a **3-Step** drill to help you learn to learn how to avoid the use of the quadriceps and hip flexors muscles to reach the leg and foot forward in front of your hips.

The drill starts with purposefully activating the quadriceps and hip flexors to reach the leg and foot forward to allow you to sense what this feels like. The second step eliminates the use of the quadriceps to avoid extending the knee. The third step (how you want to run) eliminates both the quadriceps and hip flexors to avoid extending the knee and moving the whole leg forward in front of the hips.

### Step 1: Reach forward with the foot (using quadriceps and hip flexors)

In the first step of this drill you purposefully reach forward with the foot using the quadriceps and hip flexors. Run at a slow pace and reach forward with the foot far enough so that you land on your heel at the front of each stride. Sense what it feels like to run this way with your leg and foot far forward while using the quadriceps and hip flexors.



## Step 2: Reach forward with the knees (eliminate use of quadriceps)



In this next step you run with minimizing the use of the quadriceps to extend the knee and with completely relaxed knees, lower legs and feet.

To sense what relaxed knees, lower legs and feet feel like, imagine there is a string pulling up on your knee and allow all the muscles in your lower legs to relax completely.

Ensure the ankle free of any tension and the toes naturally point downward on their own.

Now run at a slow pace with the knees and muscles in your lower legs and feet completely relaxed at the front of your stride. Pretend your legs end at your knees, and reach forward with the knees rather than the feet.

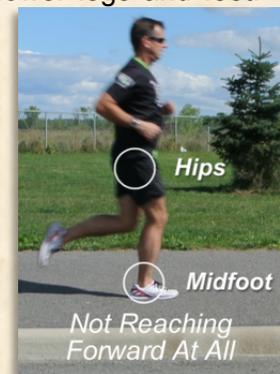
If you do this properly your feet will contact the ground underneath the knees rather than in front of the knees. Sense what it feels like to run this way without using the quadriceps to extend the knee. Let the lower leg and foot just hang from a completely relaxed knee.

## Step 3: Not reaching forward at all (eliminate use of quadriceps and hip flexors)

In this next step you eliminate both the quadriceps and the hip flexors to avoid reaching forward with either the foot or knee.

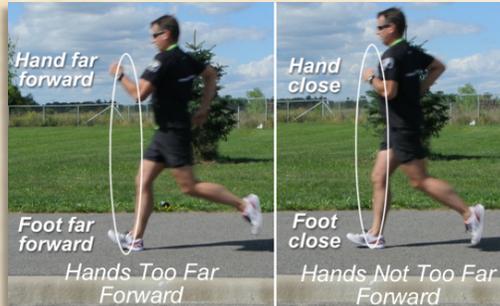
Run at a slow pace with completely relaxed muscles in your upper legs, lower legs and feet. Don't reach with the foot or knees. It should feel like the foot is landing on its own under the hips. Sense what it feels like to run this way. Keep your entire leg completely limp and relaxed at the front of your stride.

Ensure the hip flexors are completely relaxed at the front of your stride so that your knees stay downward rather than move forward. If you do this properly your feet will contact the ground in a relaxed midfoot landing just in front of the hips.



## Minimizing forward swing of your hands

The forward position of your hands plays a key role. The farther forward your hands are in front of your body, the farther forward your feet land in front of your body. Swing your arms in a way that keeps the hands close to the front of your body rather than out far in front. Try focusing on swinging your arms to the rear more rather than forward.



## How to practice

Only work on one a single component at a time and in the order described in this handout. Take your time and introduce the changes into your running slowly. When you are comfortable with one component then add the next one.

Expect while you are working on these changes they may require extra mental focus and maybe even physical effort. Remember you are re-wiring the default way your body moves and this takes time and effort until this becomes the new way your body moves.

With practice however, the changes will eventually form part of your new normal running form which will be more efficient and less prone to injury due to harmful impact!